Ministry of Education and Science of Ukraine
Zhytomyr State Technological University
Ivan Franko Zhytomyr State University
Zhytomyr National Agroecological University
Zhytomyr Nursing Institute

"Current Trends in Young Scientists' Research"

IV All Ukrainian Scientific and Practical Conference

Book of Papers

April 12, 2017

Zhytomyr

IV All Ukrainian Scientific and Practical Conference

"Current Trends in Young Scientists' Research"

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Session work №1

MODERN RESEARCH IN THE FIELD OF ENGINEERING SCIENCES

UDC 622

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OPTIMAL DIRECTIONS OF MINING BLOCK STONE DEPOSIT WITH APPLICATION OF GIS TECHNOLOGIES

The high competition in today's global market of natural stone necessitates self-cost reduction of extracted blocks from natural stone which is possible only by reducing the costs of extraction. This reduction can be achieved primarily through the introduction of modern and efficient technologies of stone mining using high-technology and productive equipment, as well as on the base of comprehensive study of structural features of solid natural stone.

In today's world, more and more companies working in the field of geology and geotechnology use special software and information systems in their work. The use of these systems can significantly speed up processing and analysis of information. Such systems can automate the processing and interpretation of geological data and use them to model fields.

For mining we should consider all possible details of mined rocks that can increase their value in the market. Taking into consideration the fact that a large number of indicators derived from the exploration describe the structure of deposits, it is expedient to solve various geological problems using computer design to display characteristics of deposits on diagrams, plans, tables and graphs. The rationality of mining process, the selection of mining methods, as well as economic feasibility of mining and capital works development depends on these indicators.

The purpose of this research is to determine the optimal areas of mining gabbro deposits with application of modern information systems.

Geometrization of gabbro deposits using GIS technologies is the object of the research process.

One of the issues to be solved in the course of geological research and in the process of block stone geometrization is the study of a deposit structure, such as shape, size and position in bowels.

Geometrization of mineral deposits is the method to study geological forms and conditions of their occurrence, properties of matter, substances filling these forms, as well as processes occurring in bowels, and to depict these characteristics in drawings (maps, posters, sections, charts, etc.).

The method of geological sections and profiles, the method of isolines and the method of three-dimensional models are the main methods to study and image graphically various indicators of a deposit.

Geometrization of mineral resources capacity is made by building isopower plans. Isopower plans can be used in planning mining works and costs for deposits development, as well as in the process of minerals extraction, etc.

Three-dimensional modeling allows us depicting mineral deposits, which in turn, promotes the most complete visual presentation of geological body structure. Modern computer technology of deposits modeling is an effective tool for analysis and processing information on geological prospecting.

GIS is a logical extension of databases that helps to complement visual information presentation and enables to solve problems of spatial analysis.

The most important characteristic of GIS is the ability to link cartographic feature (objects that have shape and location) with descriptive, attribute information relating to these objects which describes their properties.

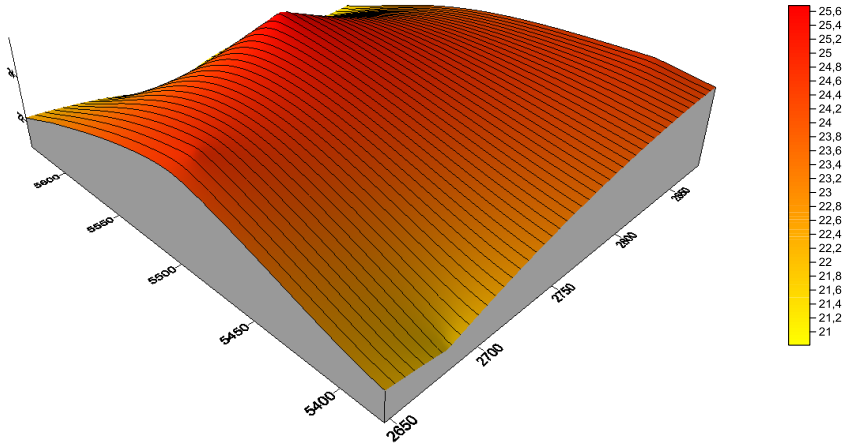

Figure 1. *Three-dimensional model of minerals thickness*

Having the data on prospecting wells we perform the interpolation of values obtained by software SURFER 11 and get volumetric three-dimensional model of a deposit (Figure 1).

Analyzing three-dimensional image (Figure 1) we can determine thickness of the layer of minerals in any part of a deposit and define areas of maximum and minimum values.

Conclusion. The development and implementation of modern information technology help to increase the efficiency of mining enterprises in the market economy, to reduce financial costs and provide economic feasibility of mining. This will present comprehensive geological information based on geological models and digital plans of deposit topography.

UDC 622

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CHARACTERISTICS OF GEOMETRIZATION OF TITANIUM RAW

Geometrization of mineral deposits is a modeling of deposit by complex usage of information obtained both in the process of prospecting and development, and by taking into account the technological requirements of exploitation.

A solution to mining-geological problems in the development of mineral resources is an essential and important part of exploitation techniques. Usually, interpretation of information about the occurrence and distribution patterns of components is performed by a limited number of parameters obtained in geological exploration. In this regard, the usage of modern methods and means of computer modeling is a necessary requirement for processing output data, which will be further supplemented, to make economically and technologically reasonable decisions.

Deposits of minerals determine the region and ways to use the technology of extraction and processing, that is why creating equal to real objects models is one of the main objectives of surveyor-geological service company. Automatization of mine engineer's workplace is carried out on the basis of geological and surveyor-engineering database.

The quality of minerals depends strongly on the chemical, physical and technological properties. These properties together with mining and geological conditions of occurrence of deposits determine the commercial value of a deposit. The value of deposits increases if there are two or more useful mineral components and the extraction of them is provided simultaneously.

Quantitative and qualitative indicators should provide accurate information about the geographical distribution of minerals and characterize its dynamics within a deposit. Selected research methods should provide opportunity to make the model of a deposit or its technological areas. Thus, one of the most important tasks to be solved during the geotechnical studies and in the process of deposits geometrization is the analysis of geographical location on the basis of geometric characteristics of bodies. One of the most effective tools of modern research and geometrization of basic parameters of alluvial deposits is GIS (geographic information system). GIS technology integrates work with databases, mathematical analysis procedures and image-map methods concerning problems of accumulation, processing and presentation of different spatially-distributed information. The main idea of GIS is to give the user the most effective device for analysis and synthesis of all types of geographically-oriented information. Software SURFER 8.00 can be used as a means of analyzing spatial data at the level of GIS desktop.

Modeling deposits using GIS, forecasting indicators placement for neighboring areas is a basis for optimal problem solving of complex research and development of

mineral resources with consideration of geological, technological and economic factors.

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ASSESSMENT OF SEASONAL FACTORS IMPACT ON QUALITY OF DRINKING WATER IN AREAS ADJACENT TO THE LANDFILL IN ZHITOMIR

One of the most urgent problems of industrialized nations is the disposal of solid and hazardous wastes, which increase each year. Hazardous wastes are solids, liquids and gases that pose a real or potential threat to the environment or to human health.

Municipal solid waste (MSW), or trash, is solid waste, that is generated primarily in homes, although it also includes the waste from commercial and institutional facilities. MSW is a heterogeneous mixture composed primarily of paper and paperboard, yard waste, glass, metals, plastics, food waste and other materials (rubber, leather and textiles), that are no longer useful and that should be disposed of.

About 4% of waste is toxic and contain more than 100 kinds of toxic compounds, such as dyes, pesticides, mercury and its compounds, solvents, lead and its salts, medicines, cadmium, arsenic compounds, formaldehyde, salts of thallium

and others. Hazardous waste should be treated to eliminate or reduce its toxicity, and the small amount of hazardous waste that remains should be disposed of in sanitary landfills that are designed to protect the environmental from contamination. Nowadays landfills have the potential to contaminate soil, surface water and groundwater.

Residential areas located close to Zhitomir municipal solid waste landfill (ZMSWL) do not have a centralized water supply system, so residents have to use well water. That is why our study of well water quality in ZMSWL vicinity is a key issue.

The purpose of this study was to examine indicators of well water quality in the laboratory and to find out if they meet current legal standards in Ukraine.

Monitoring of well water quality was held regularly during four months from September to December 2016. The analysis of the data was performed with considering the season and the distance from ZMSWL.Three sample points were selected to study at the first phase; there were three wells in the residential area at the distanced of (five hundred, seven hundred fifty, one thousand meters from the boundary of the landfill). Water sampling was conducted every month at the same time:

- in September, when the weather was sunny and there was no precipitation;
- in October, when heavy autumn rains began;
- in November, when there was the first heavy snowfall followed by rapid thawing;
- in December, when there was a heavy snowfall followed by thawing.

We examined well water quality in three wells, located at the distance of 500, 750 and 1000 meters from ZMSWL. In the course of the study the following parameters were determined: pH value (pH), alkalinity, total hardness, and nitrate concentration.

The data obtained show that pH of the studied samples ranges from 6.52 to 7.5 which does not exceed the admissible sanitary standards. The climatic conditions have little effect on pH level. In fact, pH levels depend on the distance from the source of contamination. The analysis shows that the alkalinity of samples is normal while the total hardness is more than 10 mg eq/dm^3 and exceeds the sanitary standards.

The study also revealed a significant excess of nitrate concentration which can be an indicator of water contamination by organic substances. The data obtained showed an abnormally high nitrate content in certain climatic periods.

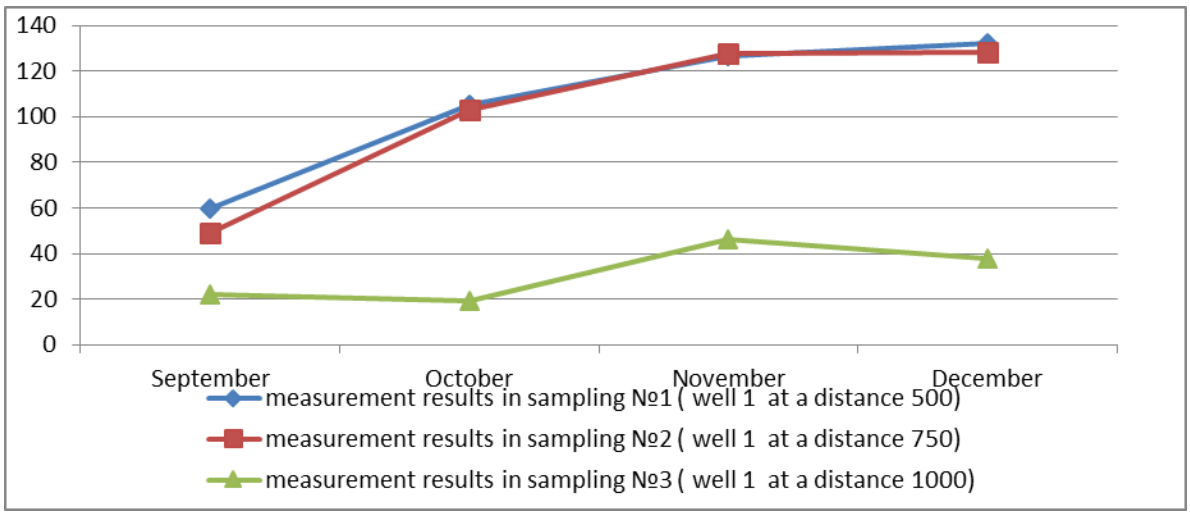

Figure. 1 Dynamics of nitrate content in well water.

The figure shows seasonal changes in nitrate content as well as its dependence on the distances from ZMSWL.

The highest nitrate content in well water is observed in November and December due to seasonal dynamics of climatic conditions and water exchange in the wells. The smallest nitrate concentration is in well 3 at a distance of 1000 meters from ZMSWL.

The results of our research show that Zhitomir solid waste landfill deteriorate the quality of well water, and threatens people's health.

We can also conclude that both ZMSWL and nearby groundwater should be continually monitored for possible pollution and precipitation runoff from ZMSWL should be collected and treated to remove any possible contaminates.

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UDC 681.5

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NEW HIGHLY EFFICIENT METHODS OF MACHINING METALS

The requirements to quality and reliability of mechanical parts are constantly increased. New highly efficient methods of machining metals are used for increasing the firmness of details to the wear, resistance to corrosion to the action of aggressive substances and improvement of other operating indexes. These machining methods have already found wide application in a modern engineering, such as the electrophysical and electrochemical machining methods. This article deals with such new highly efficient machining methods of metals as electrical discharge, ultrasonic, beam and electrochemical machining methods.

Main advantages of these methods are:

– possibility of machining of difficult form parts with playback of instrument form;

– a capacity to treat of materials of any hardness and viscosity;

– possibility of machining of the curvilinear and spiral holes, producing of the very small holes, narrow and deep slots;

– absence of distortions of materials structures;

– possibility to use of instruments, which made of less durable materials than workpiece;

– an increasing of the labour productivity and simplification of equipment during treatment of especially difficult parts.

All types of electrophysical and electrochemical machining methods can be divided into such categories: electrical discharge, electrochemical, ultrasonic, electron beam and combined.

In all these methods of machining removal of assumption is made due to electric or chemical erosion. The general disadvantage of these machining methods is a substantial increasing of energy intensity of processes. It is considered that a technique-economic effect from application of physical and chemical machining methods is that time of machining of the shaped surfaces diminishes in 2-3 times, and difficult surfaces – in 5-10 times comparatively with cutting [1].

Electrical discharge machining. There are such electrical discharge methods of machining as electro-erosive, electro-pin and abrasive-erosive.

Electrical discharge machining (EDM), also known as spark machining, spark eroding, burning, die sinking, wire burning or wire erosion, is a manufacturing process whereby a desired shape is obtained by using electrical discharges (sparks). Material is removed from the workpiece by a series of rapidly recurring current

discharges between two electrodes, separated by a dielectric liquid and subject to an electric voltage [4].

Electrical discharge machining is based on the use of the phenomenon of electric erosion that takes place on results the action of impulsive electric digits between an electrode-instrument and by an electrode-billet. There are two types of electrical discharge machining: electro-spark and electro-impulsive.

Electro-impulsive machining is based on the use of impulsive arc digits of large duration (0.1-100μs), large energy (to a few dozens of joules). For reduction of wear of electrode instrument machining in a difference from electro-spark comes true at reverse polarity, i.e., a workpiece is a cathode, and instrument – an anode. Industrial oil, transformer oil and diesel fuel are used as working liquids. Force rolling of working liquid is used for increasing of efficiency of process and reduction of wear of electrode-instrument.

Electro-pin machining is based on mechanical destruction or change forms of metallic surfaces, that is executed simultaneously with heating or melting of these surfaces by an electric current. The feature of this method of machining is the large productivity of process at low quality of machining. Electro-pin machining can be executed in air and liquid environments. A method is used mainly for machining of large size parts, for example, for cleaning out of casting surfaces and welding seams.

Abrasive Electrical Discharge Machining (AEDM), is a hybrid process, in which free abrasive grains are mixed in the dielectric fluid. It is characterized by the mutual assistance of mechanical interaction (abrasion) and thermal interaction (electrical spark erosion). Abrasive Electrical Discharge Machining is executed on a current-carrying copula by means of polishing wheels. Electrolyte is fed between a workpiece-anode and polishing wheel-cathode, a wheel gets rotary motion, and a workpiece – reciprocating. Abrasive Electrical Discharge Machining is widely applied at the flat and round polishing of hard alloys, high-speed cutting, construction and heatproof steel; polishing of profile slots, spherical surfaces; sharpening of cutting instruments [1].

Ultrasonic machining methods. Ultrasonic machining is a subtraction manufacturing process that removes material from the surface of a part through high frequency, low amplitude vibrations of a tool against the material surface in the presence of fine abrasive particles. Ultrasonic vibration machining is typically used on brittle materials as well as materials with a high hardness due to the microcracking mechanics.

There are such ultrasonic methods of machining as size ultrasonic machining and imposition of ultrasonic vibrations on a cutting tool. The ultrasonic methods of machining are based on the use of energy of ultrasonic vibrations frequency from 18 to 44 kHz with intensity more than 10 W/cm^2. The source of ultrasonic is magnetostriction and piezoceramic transformers that work from an ultrasonic generator.

There are such varieties of ultrasonic machining as:

– a free abrasive machining, that is used for the removal of small nicks-and-burrs (less than 0.1 mm) and polishing of small details (by mass 10-20g);

– machining of details made from hard fragile materials by means of abrasive slurry;

– cleaning and greasing of working surface abrasive wheel during the finishing polishing;

– use of ultrasonic vibrations of small amplitude of cutting edge and abrasive cutting tools for intensification of cutting of badly machining materials;

– use of force ultrasonic vibrations of tools for a plastic deformation during surface-strengthening machining [6, p.552].

Beam machining methods. There are such beam methods of machining as laser and electron-beam.

Material is melted and evaporated under the action of energy of beam streams or high-energy streams during use of beam machining methods.

An electron-beam machining (EBM) is a process where high-velocity electrons concentrated into a narrow beam are directed toward the work piece, creating heat and vaporizing the material. EBM can be used for very accurate cutting or boring of a wide variety of metals. An electron-beam machining (EBM) is based on removal of substance under the action of the focused electrons – evaporation or sublimation of substance from a point, an electronic beam acts on which. An electron-beam processing makes possible to process electroconductive and isolating materials with any physical properties [5, p.854].

Laser beam machining (LBM) of materials is done by means of light beam that emanates by an optical quantum generator (a laser). Laser beam machining is applied during cutting sheets of metal made of titanic alloys, non-rusting steels and compositions, and also for welding these materials. This process uses thermal energy to remove material from metallic or nonmetallic surfaces. The laser is focused onto the surface to be worked and the thermal energy of the laser is transferred to the surface, heating and melting or vaporizing the material. Laser beam machining is best suited for brittle materials with low conductivity, but can be used on most materials [2, p.609].

Electrochemical machining methods (ECM). An electropolishing is a machining at small closeness of current and stationary electrolyte. A workpiece is connected to the anode, and a cathode is the metal-plate made from lead, copper or steel. Electropolishing is used before realization of galvanic processes, for the removal of the tempered layer after cutting.

Electrochemical machining is done at small intervals between electrodes and intensive movement of electrolyte. ECM can cut small or odd-shaped angles, intricate contours or cavities in hard and exotic metals, such as titanium aluminides, Inconel, Waspaloy, and highnickel, cobalt, and rhenium alloys [8]. Both external and internal geometries can be machined. ECM is often characterized as "reverse electroplating", in that it removes material instead of adding it. A high current is passed between an electrode and the part, through an electrolytic material removal process having a negatively charged electrode (cathode), a conductive fluid (electrolyte), and a conductive workpiece (anode); however, in ECM there is no tool wear [7, p.198].

This type of machining is used for implementation of such operations:

– calibration, contour machining, removal of nicks-and-burrs, rounding of edges and marking that is done at stationary electrodes;

– copying, broaching, calibration and sharpening that is done at gradual motion of electrode;

– machining of flat and shaped surfaces, circular cutting, that is done at the rotation of cathode;

– machining of the external and internal surfaces, machining of direct and spiral ditches that is done at the rotation of anode;

– cutting by rod and cutting by a tubular-contour method, that is done at difficult motion of electrodes.

Combined machining methods are based on parallel or sequential application of several physical and chemical methods or in conjunction with cutting [3, p.425].

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DIE QUANTITATIVE AUSWERTUNG DER ERHALTUNG VON 137CS IN DEN PILZEN DES WALDÖKOSYSTEMS POLISSJA

Das Problem der radioaktiven Verseuchung ist eine brennende Frage nach der Katastrophe in Tschernobyl, die die schädlichen Auswirkungen von Umwelt- und wirtschaftlicher Situationen in der Ukraine verursacht. Es sei darauf hingewiesen, dass nach dem Unfall radioaktive Verseuchung der Wälder in achtzehn Regionen der Ukraine gefunden wurde. In nördlicher Region Zhytomyr ist die stärkste radioaktive Spur zu vermehren besonders in den Narodytschi und Ovruch Bezirke.

In Böden von Waldökosystemen wird 137Cs in erster Linie in dem oberen Waldboden gehalten, weil sie reich an organischen Stoffen sind. Radiozäsium, das in den oberen Bodenschichten und Waldstreuschicht konzentriert ist, beteiligt im System in den biologischen Prozessen. Es könne biologisch aktive oder immobilisierte sein. Eine besondere Rolle im Prozess der Immobilisierung gehört zu denPilzen.

Um Gesetzmäßigkeit der Entwicklung von Pilzen in Böden zu verstehen ist wichtig ihre Rolle in den Waldökosystemen zu bestimmen und der Umfang der Aktivitäten zu bewerten. Morphogenese, die Entwicklung und der Vertrieb von Biomassen Pilzmyzel, bestimmt die physiologische Funktion von Pilzen, ihre Fähigkeit Produkte Neusynthese zu akkumulieren. Pilze sind die Naben der verschiedenen chemischen Elemente, einschließlich Radionuklide. Außerdem beteiligen die Pilze den Kreislauf von 137Cs in den Waldökosystemen und beeinflussen die Zunahme der Waldvegetation. Man soll betonen dass, die Esskörper von Pilzen als Gegenstand der Forschung radioökologisch recht gut untersucht werden, während ihre Vegetationskörper - Myzel, die nach Forschung Olsen (1994) mehr als 90% der Biomasse aus einem einzigen Körper, kaum untersucht werden. Daher ist das Thema der Studie dieser Arbeit das Myzel von Pilzen der Waldökosystemen im Norden der Ukraine und vor allem ihrer radioaktive Verschmutzung und zwar die quantitative Bewertung von 137Cs in Pilzen Polissja.

Bodenproben für Untersuchungen wurden auf dem Gebiet des Staates Unternehmen Forstwirtschaft“ ausgewählt. Die Probenahme wurden an verschiedenen Stellen auf dem Untersuchungsgebiet, homogene Beschaffenheit der Gelände, Vegetation und agrotechnischen Bedingungen durchgeführt. Das Bodenprofil wurde nach dem Index und der Tiefe in vier Horizonten unterteilt: Waldhorizont (A0) - 0-2 cm, Humushorizont (Ah) - 2-6 cm, Humus (A) - 6-13 cm und Podzolhorizont (A2) - 13- 21 cm und diese.

Als Ergebnis der Untersuchungen wurde bestätigt, dass die Waldbestände die Erhaltungsstabilität von Radionukliden in dem kleinen Kreislauf gewährleistet, so es

die vertikale Migration von 137Cs verhindern lässt. Im Bodenprofil fördert die Bildung von Waldunterlage das Deponieren von Cäsium in den oberen Bodenschichten, als Folge bremst seine Ausbreitung im Ökosystem. Mit der Tiefe sinkt natürlich der Bodenaktivität.

Offensichtlich wird der Hauptteil des Radiocäsiums der oberen Erdschichten in organischen, organisch-mineralischen und mineralischen Fraktionen des Bodens sowie in den Bodenorganismen konzentriert, insbesondere in Pilzen.

Die Gesamtmenge des radioaktiven Cäsiums ist in dem Pilzmyzel gering und ist nur in dem oberen Bodenhorizont konzentriert.

Radiozäsium, das in den oberen Bodenschichten und Waldstreuschicht konzentriert ist, beteiligt im System in den biologischen Prozessen. Es könne biologisch aktive oder immobilisierte sein.

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HYDRAULIC PUMP MODULES

Hydraulic modules with adjustable feed. This type of pumping stations is equipped with hydraulic pumps and Uken distributors. They are intended for individual and group feeding of hydraulic actuators of presses and forging complexes, rolling mills, arc steelmaking and ore-thermal furnaces, casting machines, hydraulic manipulators and other industrial equipment.

The design of the pump module includes a pump unit, a hydraulic tank and a connection block. The pump module consists of one to four (depending on the

customer's requirements for the maximum flow rate of the working fluid) of axial-piston pumps driven by electric motors. Each pump has a built-in regulator which provides almost constant pressure when the pump capacity varies within the specified working volume.

The hydraulic tank is autonomous and is designed to power all installed pumps at the same time. The tank is equipped with a filtration system for working fluid with a device for controlling the level of contamination of the filter element and, if necessary, it is equipped with a cooling system controlling the temperature regime of the hydraulic system operation according to the liquid temperature indicator built into the liquid level indicator in the tank.

The connection block is designed for supplying hydraulic energy from pumps to hydraulic actuators. The connection block is a collector, one per pair of axial-piston pumps. Each collector is equipped with a safety valve that protects the water lines from exceeding the pressure, and two non-return valves to which the pressure lines from the hydraulic pumps are connected. In sections of the collector, channels are made that integrate the flows from the hydraulic pumps, with their output through the system of holes on the lateral flat surface, on which the adapter plate is mounted with further installation of the hydraulic distributors of the hydraulic actuators. A pressure gauge with a switch is installed on one of the manifolds to control the pressure in the drain line (neutral position) or in the pressure lines of each of the collectors (extreme position of the switch).

The block principle of the pump module design creates the possibility of distributing the working fluid both relay and proportional type in any combination, up to 4 distributors per pair of pumps. This provides the possibility of redundancy, as well as the promptness of maintenance and repair or replacement of failed components of the system.

The design of the pump module is basic and can be further developed and supplemented with the necessary components, taking into account the technical requirements of the particular customer.

Pumping hydroelectric power station with electric drive NEI-12-20I100T1 is designed for solving problems of lifting, leveling, fixing and lowering of large large-tonnage objects according to a given algorithm.

It is designed to provide hydraulic energy for lifting systems of building structures, heavy equipment, ships. The executive mechanisms of lifting systems, depending on the purpose, can be combined in pairs and fed from an individual pumping hydroelectric station NEE12-20I100T1.

The pumping stations and the lifting system are generally controlled by a programmable controller with a liquid crystal tactile panel. The use of a two-axis inclinometer automatically adjusts and maintains the horizon of the object to be lifted, even in the event of uneven subsidence under the actuators of the hoisting and deformation system of the lifting object itself.

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DISTRIBUTION OF SPECIFIC ACTIVITY OF CESIUM-137 IN THE COMPONENTS OF MOSS-LICHEN COVER

As a result of the Chernobyl accident about 3.5 million hectares of forests suffered from radioactive contamination. Polissia forests were the most affected. Pollution in Zhytomyr region reached to 60%. Even 30 years after disaster the components of forest phytocenosis contain a significant amount of radionuclides.

Mosses and lichens in comparison with other representatives of forest biota are characterized by high cumulative ability. Along with mushrooms, they have the highest specific activity, followed by herbaceous plants, shrubs, bushes and undergrowth. Due to the highly developed surface, moss cover has a significant sorption capacity which in combination with low metabolism leads to a strong fixation of highly dispersed radioactive particles. Lichens have ten times greater sorption surface per unit of weight than vascular plants. They produce specific lichen acids which can contribute to the accumulation of radionuclides. Most researchers believe that the main way of radionuclides transfer into mosses and lichens is by air; but some believe that there is that radionuclides can transit from soil with water-soluble forms by rising soil moisture through capillaries.

Moss species *Dicranum polysetum* and lichen *Cladonia rangiferina* that are wide spread in Ukrainian Polissia forests, were the objects of our study. Sampling was carried out by the routing method on the territory of Borutyno forestry. The density of soil radioactive contamination by ^{137}Cs was about130 kBq/m^2.

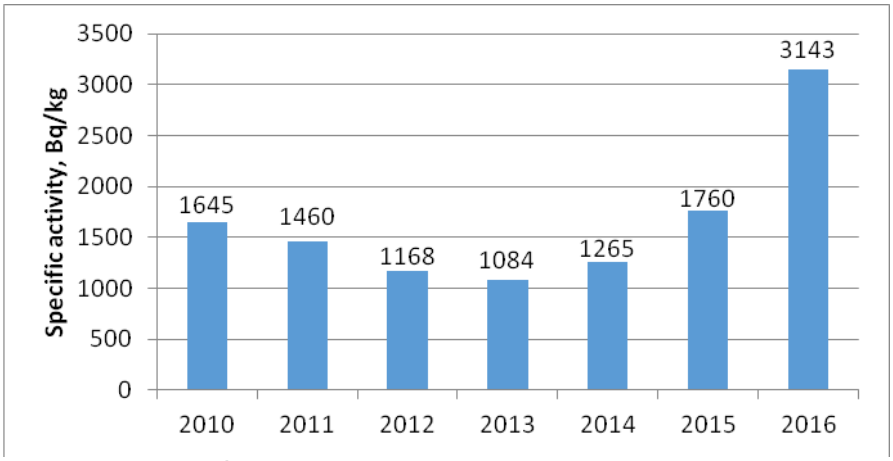

Fig.1. The dynamics of ^{137}Cs specific activity in the annual growth of *Cladonia rangiferina*

The dynamics of ^{137}Cs specific activity in seven-year old lichen thalli was analyzed. The highest value of specific activity was detected in the growth of the

current year - 3143 Bq/kg. Since 2010, there was a decrease in activity from 1645 to 1084 Bq/kg. The minimum was reached in 2013, which roughly equals to the average value in thalli. Since 2014, the activity starts to increase from the value of 1265 Bq/kg and reaches its peak in 2016 in the top of lichen. High values of specific activity in the top of lichen was repeatedly noted by researchers both in the period of atmospheric precipitations and when soil was the main source of radionuclide intake. This regularity is determined by the biological properties of lichens.

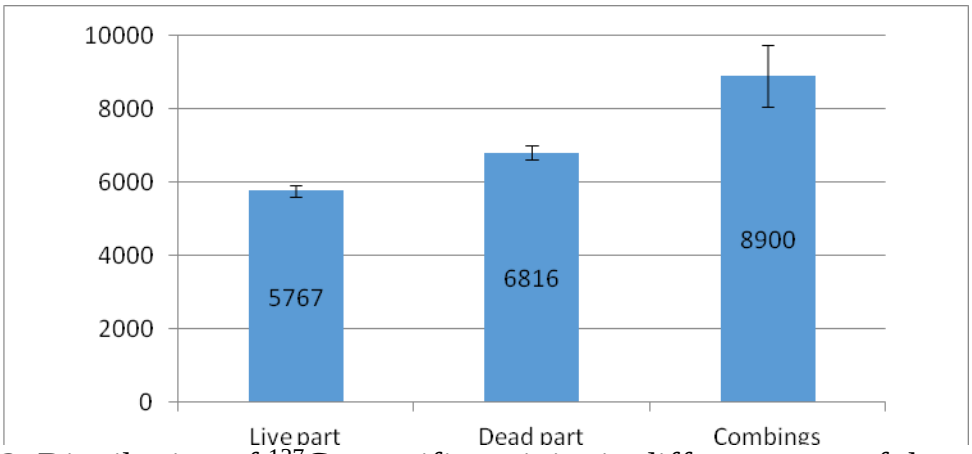

Fig.2. Distribution of ^{137}Cs specific activity in different parts of the moss

Moss samples were divided into apical (live), middle (dead) and lower (flocks) parts. According to the values of average specific activity, the lowest concentration of ^{137}Cs was detected in the apical part (5767±151,4 Bq/kg). The value of ^{137}Cs specific activity in the middle part of moss was 6816±202,4 Bq/kg. The lower part (flocks) was the most radioactive part– 8900±846,3 Bq/kg.

Comparing the values of ^{137}Cs specific activity a significant heterogeneity of radionuclide distribution in lichen and mosses can be observed. *Dicranum polysetum* (7161 Bq/kg) demonstrated high ability to accumulate ^{137}Cs compared to *Cladonia rangiferina* (1646 Bq/kg). The values of transfer factor (TF) in these species are 55,08 of 12.66, respectively. In general, ^{137}Cs specific activity in moss cover exceeded the same index in soil by 3 times (2261 Bq/kg). Thus, moss-lichen cover is a significant fraction of the total radioactivity in forest phytocenoses.

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CERAMIC BEARINGS

Rolling bearings are known to mankind for a long time. It is believed that the first experience of the application of rolling elements used to reduce friction by builders of the Egyptian pyramids. Leonardo da Vinci's also used bearings in his drawings of the helicopter. In the 17th century Galileo proposed the use of bearings with separator. Rolling bearings are the best way to reduce friction because they are used wherever friction is present from the indoor fan to aeronautics, from movies to cars and machines.

Bearings are made of steel corresponding to expected characteristics. Nevertheless, there are working conditions where conventional metal bearings can not provide the appropriate specifications. Therefore, it was decided to use other materials. Such material became the ceramics (Si3N4). Conventionally, ceramic bearings can be divided into three groups:

- *Mixed* when only rolling elements are made of ceramic, inner and outer ring are made of steel and a separator is made of synthetic materials with a low coefficient of friction.
- *Fully ceramic* when rolling elements and rings are made of silicon nitride.
- *Bulk* that are used as common layers in steering bushings.

Ceramic bearings feature many advantages compared with metal ones:

- High corrosion resistance makes it possible to work in harsh environments without corrosion.
- Lightweight, ceramic bearings are 40% lighter than metal reducing centrifugal force at high speeds.
- They have more strength to help smaller wear of layers during rotation.
- Chemical resistance, high dielectric properties and lack of magnetism allow to work in the petrochemical and nuclear industries and in installations with high electrical insulation as well.

Actually, ceramic bearings have disadvantages: fragility, high cost and low range. These properties allow you to use ceramic bearings in high-speed spindle units, gas and jet turbines, in precise navigation devices in the aerospace industry, for medical equipment and other industries.

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ENERGY EFFICIENCY: POSSIBLE SOLUTIONS FOR UKRAINE

The study deals with the problem of efficient use of energy. Some ways of decreasing energy wastes in Ukraine are suggested.

Energy efficiency means using less energy and transition to renewable sources of energy with providing good quality services [1]. The most energy efficient countries in the world are Germany, Ireland, Denmark, the UK, Norway, France, Austria, Italy, Mexico and Australia. That is why learning the experience of foreign countries in this field can be useful for Ukrainians [2].

According to European experts, Ukrainian consumers and businesses spend energy in a very irrational way. Energy consumption in our country is in 3,8 times higher than in most European countries. It has to be reduced on 55 – 75%. Another problem is that Ukraine uses too much fossil fuel, which makes 80% of all energy [3]. As a result, greenhouse gas emission here makes it one of the highest in the world. Rapid increase in the cost of electricity in our country motivates Ukrainians to search for possible solutions for reducing energy consumption, increasing efficiency and using alternative sources of energy more. All these factors reveal the relevance of our research.

The objective of the research is to demonstrate some ways of increasing energy efficiency in Ukraine.

For carrying out this research mostly Internet resources were used such as sites of international organizations and companies [1 – 4].

The research we have carried out let us outline some ways of reducing energy consumption in Ukraine. Finding solutions of energy problems in Ukraine is possible by uniting efforts of the government, scientists, businesses, educators and the citizens.

On the level of the government, energy efficiency policy should be implemented and monitored by the Ministry of Energy and Coal Industry of Ukraine. The Verkhovna Rada has to make all the required legislation changes. The State Agency of Energy Efficiency and Energy Saving of Ukraine should work with businesses introducing energy efficiency programs for commercial and municipal enterprises. Clear energy policy has to be introduced and controlled. Energy consumption audit has to be carried out and afterwards proper measures should be taken.

Scientists should make their contribution into finding solutions for energy efficiency. The Institute of Renewable Energy of National Academy of Science of Ukraine has been carrying out a number of studies of energy efficiency issues. They have developed some practical ways of renewable energy sources usage. It is also necessary to turn to sustainable energy use in transport industry (electric vehicles, alternative fuel stations, etc.)

Companies implementing green technologies should have some tax benefits. Ukraine Energy Efficiency Program (UKEEP) was created by the European Bank for Reconstruction and Development (EBRD), it helps Ukrainian private companies find money in order to invest in energy efficiency or renewable energy projects [3].

Aid from the world organizations (European Bank for Reconstruction and Development, European Union Development Program, United States Agency for International Development etc.) should be used properly and wisely. Both Ukrainian government and international organizations should grant financing of projects on energy efficiency, and provide low-percent bank loans on them. A good example of such projects is "Improving energy efficiency and promoting renewable energy in the agro-food and other small and medium enterprises (SMEs) in Ukraine", which was initiated by the United Nations Industrial Development Organization (UNIDO) and the Global Environment Facility (GEF).

Businesses and companies have to change old energy consuming equipment on the modern energy efficient one. They have to produce energy efficient home appliances and devices with proper marking (giving their customers all information about the energy consumed). They must also work on reducing the number of wastes and building recycling plants.

Citizens of the country have to be encouraged to sort the rubbish in order to provide paper, glass, metals, plastic etc. for recycling. In order to use less energy for heating thermal isolation of buildings must be done by individuals and companies. Ukrainians can cut energy consumption at home by using energy efficient home appliances and devices. Using LED lamps for lightning is also a great solution and allows cutting energy consumption on lightning in 10 times. Moreover, energy saving can be helpful at home when you turn off all the electric appliances when they are not used and increase use of natural light during the day.

Providing consulting services on energy efficiency is also very important. Universities, schools and other educational institutions should include energy efficiency courses in their curriculum in order to develop the new thinking in the young generation.

As a conclusion, energy efficiency is a key to saving the Earth for future generations as well as promoting economic development of Ukraine. All the ways of reducing energy consumption and increasing energy efficiency described in the presentation are to be used in Ukraine. This can bring multiple benefits: development of the national economy, reducing energy costs, saving money and enhancing quality of life, reduction of greenhouse gas emissions, improving national security etc.

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ANIMALS THREATENED WITH EXTINCTION

Million of years ago, there were three hundred or more different species of dinosaurs. Then, about 65 million years ago, something happened, and now there are no dinosaurs. At about the same time, 70 per cent of all species in the world became extinct. Most of the species in the sea disappeared 250 million years ago [1, c.1].

Scientists state that many species of plants, animals, birds and insects disappear from the face of our planet 1000 times faster than the natural level. This means that we lose 10 to 130 species every day. To date, more than 40 per cent of all living species on the Earth are threatened with extinction [2].

The greatest danger threatening amphibians: the risk is 41% of the species. For comparison, the risk among the birds is 13% of species. The greatest losses were reported in the Southeast Asia. There, the animals most likely lose their traditional habitat through cutting down the jungle for agricultural purposes. Paradoxically, one of the aims of cutting down the jungle is planting of the crop which produces environmentally friendly biodiesel [3].

Disappearance of such a large number of animals will inevitably lead to environmental disaster. If this will last, then the number of endangered species will be calculated not in hundreds or thousands, but in millions.

There is the reason for optimism, as environmentalists claim. According to intensive scientific collaboration some kinds of total destruction are maintained. For example, it was succeeded to breed in captivity and restore natural habitat for California condor, black-footed ferret (the USA) and Przhevalskii horse (Mongolia). Particular restrictions helped to rapid humpback whales growth and their exclusion from the Red Book [3].

The main cause of extinction of animals is human activity. Man does not hesitate destroying the natural habitat of animals. Plowing the soil, cutting down forests, building factories and roads, a person deprives animals of their habitat and reduces the amount of fodder resources, which leads to a sharp reduction in the population size. Wastes of industry fall into rivers, seas and oceans, which leads to

the extinction of hundreds, and even thousands of marine animals. Some species are hunted because of their valuable parts of the body, for example, horns, skin, and fangs.

In all countries of the world there are certain laws on protection from the extermination of wild animals that regulate rational hunting and fishing, Ukraine has laws “On the protection of the natural environment”, “On the protection and use of wildlife”, “On wildlife”, etc. [4].

At the moment there is the so-called Red Book of the International Union for Conservation of Nature, adopted in 1948, where all rare animals and plants are recorded. In Ukraine there is a similar Red Book. In the first edition (1980) 85 species and subspecies of animals were introduced, in the second (1994) - 297 species, and in the third (2009) - 542. Unfortunately, every year the list of rare animal species increases [5].

What can we do? How to keep animals from completely disappearing? I think we should open more reserves and national parks, where the animals could live in their natural environment. In these areas, it is necessary to prohibit hunting, deforestation, construction of buildings, paving roads, etc. It is also necessary to organize feeding of animals.

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LINEAMENT ANALYSIS EFFICIENCY FOR QUALITY MANAGEMENT AT DEPOSITS OF NONMETALLIC BUILDING MATERIALS

The last decades are marked with active implementation of data on remote sensing, including especially space survey materials, in the practice of earth sciences.

The question of determining the most effective system of a deposit development in certain geological conditions was always important in mining. The

study of lineament analysis efficiency is necessary to optimize the management of mining non-metallic minerals.

The function of geostructural indicators should be taken as the objective function of optimal process management that will ensure effective extraction of non-metallic building materials

Let's consider the basic content and objectives of the lineament analysis. The term "lineament" is used to describe linear objects allocated by images of closed areas. Lineament and geodynamic analysis is a complex of geological, geomorphologic, remote sensing and other methods of mapping the fields of tectonic fractures and geodynamic activity. The analysis is to obtain the original model of lineament field by decoding materials of aerospace surveys. Decoding lineaments consists of the following sequence:

1. The process starts with the selection of the area to be studied;. Geographical or UTM coordinates of the area are used to retrieve DEM (Digital Elevation Model) data.
2. The next step consists of determination of the lineaments in the area under study. A combination of topographic maps, aero and sat-photos, and the DEM is used.
3. The next step is the integration of the lineament data with the available geophysical and geochemical information. Further, all this information is differentiated and integrated into one layer of information using a correlation model. All useful information in a one-layer map is called "prospective map"
4. Using a combination of software, such as SURFER, ENVI, MapInfo, etc., we proceed with the graphical modelling of the integrated data. The prospective map shows all the potential targets in the area. Next, the preliminary target areas are compared with the claim maps (if they exist) and with the available geological and assessment work data to make a final proposal of the potential areas.

Therefore, taking into account mentioned above, we can conclude that the use of lineament analysis, in addition to theoretical interest, is of great practical importance in the control of mineral deposits quality. It allows reducing significantly the costs and time for identification and analysis of structural and tectonic structure, which will enable to choose the best and more cost-effective way of mining.

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UTILIZATION METHODS OF SOLID HOUSEHOLD WASTE

The problem of household waste being potentially dangerous both for people health and the environment is considered in the article. The methods being used for neutralizing solid waste are given. The scale of the problem has been described.

Key words: ecological problem, solid household waste, utilization, landfills, composting, incineration.

At present waste is one of the major up-to-date ecological problems being potentially dangerous for people health as well as for environment. In many countries the problem of misunderstanding all the consequences of the problem dealing with solid household waste may arise. Unfortunately, as the result of the above misunderstanding, there are no strict regulations as well as prerequisite legal acts regulating the problems concerning wastes and litter [1].

Nowadays pollution is very harmful to environment. It is mainly caused by people improper activities. Harm from factories and processing enterprises operation results to huge damage. The problem of accumulating and recycling wastes endangering environment needs its solution as wastes are being spread out, accumulating in large quantities and exerting negative impact on setting. Proper waste recycling is a huge step towards improving the environment.

For the last decades many countries of the world suffer from increased quantity of solid household waste as urban trash that makes up 150 – 300 kg/year in average per capita. Annual increase in the number of solid household waste makes up not less than 3% and in some countries nearly 10% [3]. The solution of the problem can't be restricted by finding the only way of recycling. The main task of each method is to fulfill the task, not allowing the spread of harmful bacteria and microorganisms. At the same time, it is necessary to minimize harmful substances being released in the course of recycling [2]. The commonly used methods of neutralizing solid waste are landfills, composting and incineration.

Let us consider these methods in detail. Throwing daily waste/garbage in the landfills is the method being most widly-spresd today. This process of waste disposal focuses on burying the waste in the land. Landfills are commonly found in developing countries. There is a process used that eliminates the odors and dangers of waste before it is placed into the ground. While it is true this is the most popular form of waste disposal, it is certainly far from the only procedure and one that may also bring with it an assortment of space.

This method is becoming less popular these days due to lack of space available as well as methane and other landfill gases, that may cause numerous contamination problems. Landfills give rise to air and water pollution which severely affects the

environment and can prove fatal to the lives of humans and animals. Many areas are reconsidering the use of landfills [4].

Composting is another most frequently used waste disposal or treatment method which is the controlled aerobic decomposition of organic waste materials by the action of small invertebrates and microorganisms. The most common composting techniques include static pile composting, vermi-composting, windrow composting and in-vessel composting [5]Incineration or combustion is a type disposal method in which municipal solid wastes are burned at high temperatures so as to convert them into residue and gaseous products. The greatest advantage of this method is in its ability to reduce the volume of solid waste from 20 to 30 % of the original volume, decrease both space they take up and stress on landfills. This process is also known as thermal treatment where solid waste materials are converted by incinerators into heat, gas, steam and ash [6,7]. On the basis of the above mentioned the conclusion should be made that researching the processes taking place in biosphere and the impact of household human activity show, that only creating ecologically non-waste and small-scale productions could prevent resources impoverishment and environment degradation. People economic activity should be build on the principal of nature ecosystems economically expending substance and energy and where some organisms waste serve as habitat for others, i.e. circulation of substances is taking place.

Despite huge scale of the problem of waste exporting it is being solved. Each inhabitant of the planet should start dealing with the pollution problem. Only integrated approach to this global problem involving the states, local authorities and people of the planet could minimize consequences of waste harmful effects on the ecosystem.

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UDC 574:630.8

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ASSESSMENT OF ^{137}CS RADIOACTIVE CONTAMINATION OF WILD MEDICINAL PLANTS IN FORESTS OF ZHYTOMYR REGION

Due to radioactive contamination after the Chernobyl accident there is still a big amount of 137Cs which is accumulated by plants. Forests absorbed large amount of radionuclides and they still remain critical landscapes in terms of radioactive contamination. Many wild herbs that grow in the forests are used by local people for medical application. Long-term studies indicate that plants species have inherent specificity to accumulate radionuclides. That is why, each plant species in the territory with high density of soil radiation contamination can accumulate radionuclides in different manner. The accumulation of radionuclides by tree species is determined by many factors: the type of site conditions, characteristics of silvicultural plantations, peculiarities of radioactive contamination, radionuclides migration in forest ecosystems, biological characteristics of tree species.

The aim of our study was to evaluate the ^{137}Cs radioactive contamination of certain species of wild woody herbs. Due to the fact that the population of Zhytomyr region uses wild woody herbs for medicinal purposes, such prevailing in the region species as oak (Quercusrobur L.), buckthorn fragile (Frangulaalnus Mill.) and pine (Pinussylvestris L.) were selected as research objects. Bark samples of every tree species, as well as pine needles, were selected in the 6-fold repetition. Sample site is located within SE "Ovruch LH" in the 31st block of Borutynske forestry. Studies were conducted in 2016 in fresh pine forests (B_2) at a density of soil radioactive contamination of 130 kBq / m^2 (3.5 Ci / km^2). Measuring ^{137}Cs specific activity in samples was carried out in modern ZSTU Radioecology Laboratory with Gamma spectrometer GDM-10 20 PLUS.

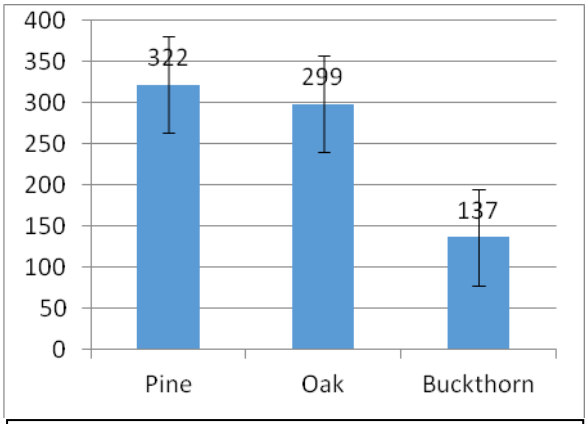

Figure 1 Concentration of ^{137}Cs in bark of various species of medicinal trees, Bk / kg/

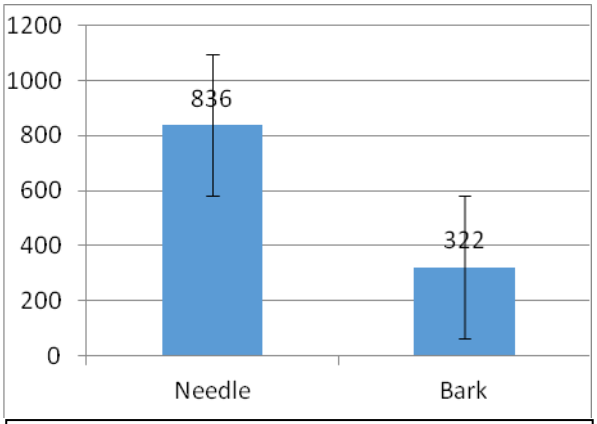

Figure 2 Concentrations of ^{137}Cs in bark and pine needles, Bk / kg.

Figure 1 shows the average ^{137}Cs specific activity in three selected species of wild medicinal trees. Pine bark is characterized by the largest quantities of 137Cs

specific activity among investigated medicinal tree species - 137.4 ± 322 Bq / kg, which is not much more than 299 oak bark ± 51,8Bk / kg. Buckthorn bark was the least polluted - 137Cs137 ± 21,7Bk/kg, which is 2.5 times lower than the concentration of radionuclides in the bark of pine and 2 times less than in the bark of oak. Figure 2 shows a comparison of ^{137}Cs specific activity in the bark and needles of pine. Figure 2 shows the average ^{137}Cs specific activity in needles - 836 ± 262,1 Bq / kg, which is 2.6 times more than ^{137}Cs contamination in the bark - 137.4 ± 322 Bq / kg. Data analysis shows features of ^{137}Cs accumulation by different organs and tissues of woody plants. That maximum ^{137}Cs accumulation is observed in needles – photosynthetic organs of pine which are characterized by 2-3 times higher content of ^{137}Cs than in a bark pine.

Comparing obtaining ^{137}Cs specific activity with normative values, we can see that the excess of permissible levels of ^{137}Cs radioactive contamination is observed only in pine needles (^{137}Cs am not> 500Bk / kg). The average ^{137}Cs concentration in needles exceeds the standard value by 0.5 times; in some samples of pine needles ^{137}Cs concentration values exceed allowable standard value by 3 times. In general, the conclusion can be drawn that oak bark (^{137}Cs am not> 600 Bq / kg), buckthorn (^{137}Cs am not> 600 Bq / kg) and pine (^{137}Cs am not> 500Bk/kg) can be used as a medicinal plants. Storage and use of needles is advisable to prohibit or restrict with the obligatory radiological control. These recommendations should be used taking into account contamination density 3,5 Ci/km^2 and the type of forest vegetation conditions B_2.

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THE INSTRUMENTAL AND TECHNOLOGICAL PROVISION OF MAKING OF ELEMENTS WITH THE COMPLEX SHAPE OF SURFACE CONNECTION

Recently EC-profile connection (profile connections with equiaxial circuit transmitted the moment) has been found in various kinds of equipment. In foreign

engineering building practice, EC-profile connections are used in gearboxes and guitars of semi-automatic lathes which are produced by companies «Pittler», «Fischer», «Schaublin», «Bamessberger», in the building car engines of «Volvo», press-forging equipment and tool-in-use systems [1].

In engineering, the following profile connections are commonly used: profiles with three faces EC-3, profiles with three cut faces EC_c-3, profiles with four cut faces EC_c-4 and with five faces EC-5 and EC_c-5.

Non-splined connections have operational advantages which are determined by high spinning toughness, wearability, endurance strength, on load centering, low level of noise and vibration, the possibility of reducing the weight by 20-40% and also the size of machine transmitting elements. These connections are more durable, reliable, have less metal intensity and their production is less time-consuming than of slotted and splined. From economic point of view, EC-connection is more beneficial and provides low producing and composing rates of prime cost.

Issues in calculating of EC-profile connection elements concerning static force, toughness and vibration strength are not completely resolved and usually it leads to oversizing of shaft cross-section and other parameters. Normal size row of profile shaft and ports with balance circuit of EC-3 type has range from 13 to 100 mm. As the basis for the calculation of the shaft a scheme is taken accepted in engineering practice in the design of machine parts:

1) project calculation EC-3 of profile shafts – equiaxial circuit edge on static force formula;
2) checking calculation of EC-3 profile shafts – toughness on bending, static force and endurance strength.

According to this method, comparative calculations of core, slotted and round shafts were performed [2]. Studies have shown that performance indicators of relevant shafts on 10 .. 45% higher than splined and 30% higher than slotted. At the same time the approaching tendency of operational indicators of EC-3 and EC-5 profile shafts on indicators of round shaft could be observed. The experiment has also shown that safety of the type profile is higher than of slotted shafts on 26%. Profile shafts of EC-3 and EC-5 type are mostly equal to slotted shaft and only slightly exceed the latter on toughness. Calculations also showed that toughness on rotation of profile shafts in 1,4…1,8 times higher that of slotted ones. In case when the same load amount influences comparative shafts profile shafts EC-3, EC-5 have less mass per length unit than splined shaft – 5%, 8%,12%; slotted shaft – 27%, 30%, 36%.

The most common method of processing of EC-profile shafts is turning on lathes. Lathes of this type are equipped with tool holders and revolver heads of various configurations. For their usage several modifications of peakless bevel incisor were made. Polishing is used as a finishing operation for shaft processing which could be held by modernized lathes of general use which are equipped with special devices. For port processing broach bits with EC-profile tooth are used, the finishing processing of which is made on round polishing and modernized lathe backed-offs. Also ports could be made by boring, milling and grinding, but one of the advanced techniques-battering.

Research of connections with complex profile surfaces is assume to continue using modern computer technology.

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RECLAMATION OF ABANDONED MINES

Reclamation of abandoned mines holds a significant place in sustainable development of the country, as well as in national security and economic development. It was found out that deterioration and further destruction of abandoned mines is a threat to secure vital activity and sustainable development of the country. This implies the search for new solutions of the problems of abandoned mines reclamation. It is necessary to develop safe, reliable and cost-effective projects for reclamation of abandoned mines; it is established in the Code of Ukraine on mineral resources, Article 54 "Liquidation and conservation of mining facilities".

The most common variants of mining waste reclamation are the following: backfill with the rocks from dumps and fill with water.

Filling mine with waste rock poses no technical difficulties. At the same time, not only dumps are eliminated and withdraw from their sites to be used for agricultural purposes, but the depth of mines also reduces. However, such reclamation is justified only for shallow mines if there is sufficient amount of waste rock and fertile soil. Reclamation of deep workings requires more complex solutions. Despite the huge dumps (up to 100 m), their number is not enough for filling deep workings (depth to 500 m) and for terrain levelling. Thus, the process will require additional volumes of waste rock and fertile soil for covering the surface area.

Mines can be almost completely filled with water, therefore artificial reservoirs can be created. But for this purpose only mines with a small depth can be used. To fill openings, such as at the mine "Progress" (m. Torez) (1340 m) or the mine named after V.M. Bazhanov (Makeevka) (1200 m), is not possible because of insufficient water supply. Also, mine flooding has no economic feasibility, because such conditions are not appropriate for fishing.

Mine reclamation can be made for:

• construction of buildings and structures;
• construction of sanitary facilities (parks, recreation areas, sports grounds);
• construction of reservoir.

The most difficult case among listed above is the construction of buildings and structures on anthropogenic relief when special measures for strengthening and consolidation of the foundation is necessary.

In settlements it is possible to organize production which requires special conditions on microclimate; the alternative construction of buildings for such production followed by dump formation for reduction of heat loss during the cold season is also feasible.

Some production spheres, such as nuclear power, need specific storage facilities. Spent nuclear fuel is rendered harmless or enriched, after which it can be reprocessed. Many states conserve waste in order to enrich them. German storage facility in a worked salt mine in Morsleben provides safe storage for wastes for three decades.

The mines "Artemsoli" (located near the town of Soledar) and Artemovskaya (near the village Bryantsevka), where the first well with a depth of 292 meters in the years 1877-1878 was drilled, were offered to use for tourism purposes. That's when it became known that this place is the bottom of the shallow bay of the ancient Perm Sea, which is about 250 million. Years ago this sea created large salt deposits.

Health centre "Salt Symphony» was opened in the salt mines recently. Due to its properties the resort is a good place for treatment allergic diseases.

To develop such reclamation measures, further study of potassium mines in Kalush, Ivano-Frankivsk and Stebnyk (Lviv region) is required.

After working some mines have continuous hollows. Liquid is not accumulated in such mines, thus it meets the parameters of gas and oil storage inside them.

Mines can be used for creating bomb shelters in case of war. In the era of nuclear weapon just mines can be used as shelters.

Thus, recreation of mines can be economically profitable. It can be done to ensure the protection of life, life safety and health improvement.

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UDC 622.1

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METHODS OF CALCULATING MINERAL RESOURCES AT THE GRANITE DEPOSIT "KAMYANA GIRKA"

In geostructural concept deposite "Kamyana Girka" is located in the northwest part of Ukrainian Shield. The minerals are weathered and immutable diverse-grained granite of Korosten intrusive complex.

Depending on the form and the conditions of the deposit occurrence, as well as the geophysical exploration system and the amount of exploratory points, goals and purpose of calculating reserves, there could be used various methods of calculation.

Method of geological blocks was used on the basis of the geological structure of the deposit, conditions of occurrence of mineral and mining features of its design.

The reserves of field are classified by categories "A", "B", "C_1"by the results of detailed exploration. The deposit is divided into5 blocks: "A-I", "B-II" "B-III" "C_1-IV", "C_1-V". Let's consider the block "B-III".

Block area of the deposit hanging wall is of 234267 m^2, and the area of the footwall of the deposit is of 302273 m^2. The average thickness of the mineral is 50,6 m, the reserves amount is 13862,5 thousand m^3. The thickness of overburden rocks is 13.3m. The volume of overburden rocks is 3443,6 thousand m^3.

To verify the calculation of the resources volume we use geological information system Golden Software SURFER. It can calculate the volume of three-dimensional subjects limited by upper and lower surfaces.

As a result, the volume of minerals at granite deposit "Kamyana Girka" is the following:

For friable overburden:
Trapezoidal Rule: 4517870.4634239 m^3;
Simpson's Rule: 4517848.6308751 m^3;
Simpson's 3/8 Rule: 4517849.4545001 m^3.
For the rock overburden:
Trapezoidal Rule: 607162.30562163 m^3;
Simpson's Rule: 607114.36484496 m^3;
Simpson's 3/8 Rule: 607114.65522404 m^3.
For minerals:
Trapezoidal Rule: 62550205.941083 m^3;
Simpson's Rule: 62550288.432091 m^3;
Simpson's 3/8 Rule: 62550285.41614 m^3.

Comparing these two methods of calculating the volume of granite reserves, we conclude that the method of geological blocks is more accurate. This method allows determining the average value of calculation parameters and limits of their reliable interpolation and extrapolation with maximum justification for this stage of block exploration.

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EFFICIENCY OF CROSS-RECUPERATIVE HEAT EXCHANGER IN SOLIDWORKS FLOWSIMULATION ENVIRONMENT

The use of renewable energy sources (RES) is constantly increasing due to the reduced negative impact on the environment and economic and energy feasibility.

In current economic and energy situation, industrial production, including construction materials, looks for ways to reduce the use of fossil fuels, such as coal, oil, natural gas. In Ukraine, the annual demand for energy resources is only 45% covered by domestic production and extraction of fossil energy sources. Energy independence can be achieved by improving the energy efficiency of manufacturing processes in the production of building materials and by using renewable energy instead of non-renewable energy resources that are imported into our country.

That's why in Ukraine and abroad 2 .. 500 kW heat generators for biomass burning are widely used in drying of building materials, agronomy, and so on. Such heat generators run on sawdust, granules, pellets, peat, wood and have different performance. For example, the company named MEPU has made its own assessment of efficiency of heat generators different fuels. The results are presented in Table 1.

Table 1. The coefficient of performance (COP) of MEPU heat generators using different fuels.

Fuel	**COP (%)**
Electricity	97,0
Gas	87,1
Wood pellets	86,0
Diesel fuel	81,6
Dry wood sawdust	80,5
Oil fuel	72,6
Coal	56,1
Wood	49,5
Peat	38,6
Raw wooden sawdust	35,1

The research shows that the energy potential of biomass in Ukraine is about 23.1 mln. tons of equivalent fuel per year. In this research work we use a biomass heat generators for heat-drying of kaolin in a rotary dryer (the size of the drum D=1.8, L=10 m). Primary kaolin humidity is 20%, the final 6%. To avoid pollution of kaolin by products of biomass combustion, it is proposed to use cross-recuperative needle-type heat exchanger for heating air (about 550 ^{o}C). Products of biomass

combustion after leaving the heat exchanger and after undergoing cleaning equipment will be released into the atmosphere.

Taking into account heat used for drying (1560 kW) and heat capacity of the drying agent we calculated the required amount of drying agent and selected "Inka" heat generator of POV 1700 Brand (1700 kW thermal power). It is assumed that the flue gases have a temperature at the inlet of heat exchanger = t_{gas} 1100 ^{o} (data based on manufacturer of heat generator), output flue gas volume is V_{gas} = 1500 m^3 / h. Based on these initial data we modeled and calculated the needle heat exchanger for heating the air in the amount V_{air} = 1350 m^3/h to temperature 550^{o}C.

Model of needle cross pipe heat exchanger with distribution grid is shown in Fig. 1a. The material used for heat exchange pipes is chromium stainless steel containing 25% of chromium. It is assumed that the heat exchanger metal body lined with fireclay bricks.

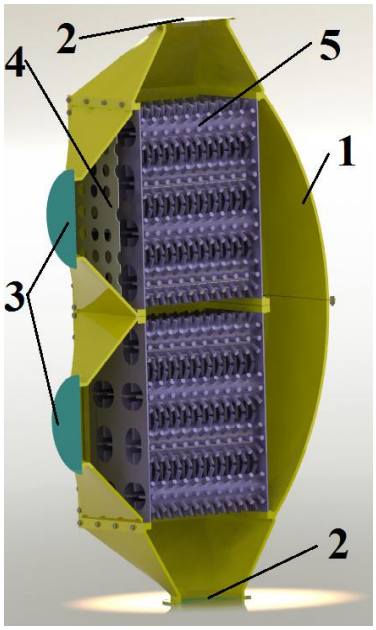
The simulation results in heat exchanger in SolidWorks FlowSimulation environment showed that the incoming airflow is not evenly distributed in heat exchange pipes (Fig 1.b). Most of the airflow passes through the heat exchange pipes, which are in the center. Therefore, to improve the efficiency of the heat exchanger it is recommended to install the distribution grid (position 4, Picture 1, a) for a more equal distribution of the incoming flow of air through the heat exchange pipes.

It is known that the efficiency of the heat exchanger can be calculated as follows:

$$\varepsilon = \frac{T_{hot}^{inlet} - T_{hot}^{outlet}}{T_{hot}^{inlet} - T_{cold}^{inlet}}$$

where T_{hot}^{inlet} - temperature of flue gas inlet, T_{hot}^{outlet} - flue gas temperature at the outlet and T_{cold}^{inlet} - air temperature at the inlet.

According to dependence (1) efficiency of the heat exchanger without distribution grids and with the establishment of distributive grating based on a number of simulation research with different air supply and combustion of biomass products was calculated. Installing distribution grid allows an average of 7-12% increase of the heat exchanger effectiveness.



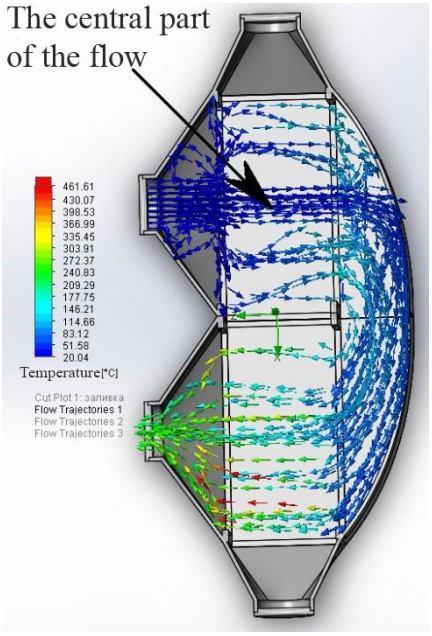


Fig 1. Cross-type needle recuperator: 1- corpus of recuperator, 2- the cover, which set the conditions and objectives of researching for input and output of combustion products, 3- the cover, which set the conditions and goals for research air input and output, 4- mesh partition to redistribute incoming air flow, 5- heat needle pipes.

On the other side installing distribution grating leads to the additional hydraulic losses. Hydraulic approximate loss is calculated as the difference between the pressure at the inlet and outlet (ΔP) by the following:

$$\xi = \frac{\Delta P}{pV^2/2}$$

where ρ - density of gas, V – velocity of gases.

To obtain the components of dependence (2) in FlowSimulation project we stated the relevant research objectives, namely, the pressure and speed of inlet and outlet air. After several researches with different air supply, it is found that after installation of distribution grating hydraulic loss increases with higher speed of the input stream. Generally, hydraulic losses increase by 5-10%.

According to the results of modeling it is determined that the recuperator heating surface must be at least 6 m2. The maximum, minimum and average values of the drying heat agent at the recuperator output are determined as well. They are pressure, temperature and flow rate, efficiency of the heat exchanger and hydraulic losses.

In general, the proposed measures (installation of grating for a more equal air distribution through the heat exchange pipes) can improve the thermal efficiency of the designed recuperator by 7-12%.

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REDUCING ENERGY CONSUMPTION: THE BEST WAYS FOR UKRAINIAN HOMES

The main ways to cut energy consumption are considered. Possible solutions for individual homes in Ukraine are suggested.

Energy consumption in Ukraine is very high. International organizations emphasize the necessity to reduce it on 55 – 75% [1]. Ukrainian government is taking measures to reduce energy consumption. One of them is increasing the average price of electricity (from UAH 0.28 per kWh in 2013 to 0.90 per kWh in 2017), which is the most stimulating way for every consumer [1]. If about 45 mln citizens of Ukraine start saving energy at home the results will be significant and beneficial for our country and our planet. This explains the relevance of our research.

The objective of the article is to develop some practical recommendations on reducing energy consumption in Ukrainian homes.

The results of our research demonstrate that in order to help the planet and pay less for electricity every Ukrainian should follow some steps. First, it is necessary to realize why the problem is relevant and what consequences we will have if energy consumption does not fall. People's awareness has to be developed by social advertising and energy saving campaigns. Schools, colleges and universities have to include this topic into their curriculum and analyze its different aspects in various courses.

Second, each of us should take practical measures to reduce electricity consumption. Here are some recommendations:

Change some of your habits. Try to make your conditions of living more natural. Be active and spend more time outside. This will not only save some electricity, but will also help you keep fit. Get used to lower temperatures inside: 18 – 20 degrees is considered the best for living. Proper insulation allows you reducing heat loss in winter and unneeded heating inside in summer [2].

Use windows and balconies wisely: blinds or curtains can help in reducing unwanted heating in summer, when it is cold open them up to let the sun shine and heat your home providing natural light.

Use more natural light instead of electric light. Remember that exposure to natural light increases happiness [3]. Take into account that small desktop lamps use less power than big overhead light.

Replace all the incandescent light bulbs with energy efficient ones (LEDs), which use up to 85% less energy [4].

Turn off all lights and electronics when they are not in use. Unplugging electric appliances helps in reducing electricity costs.

Use modern energy efficient appliances. According to experts, microwaves, multi cookers or pressure cookers, outdoor grills etc. use less electricity than electric stoves and ovens [4].Always buy energy efficient appliances (not lower than A+ or A). Think about replacing old energy consuming devices with the new ones, which can save up to 50% of energy wastes. Read and follow instructions to make your appliances cost-efficient.

In summer use air-conditioning efficiently, the difference between outdoor and indoor temperatures should be not more than 5 degrees. Turn it off at night and never leave it switched on if you are out.

Wash dishes with warm water, don't make it too hot. Do the laundry at low temperatures and full load, use the quick cycle when possible. Dry clothes by hanging them out. The same rules are good for dishwashers [6].

Use energy during off-peak hours. Ukrainian electric companies give a 50% discount on electricity used from 11 p.m. till 7 a.m. (a dual phase electric meter is needed in this case). Wash, iron, heat water in the electric boiler, use fans, electric ovens, multi cookers and charging devices at this time.

And finally, use renewable energy. For example, solar water heaters or solar lightning systems can reduce electricity bills by 50%. Buy solar chargers and solar power banks for your gadgets.

Be creative and you will find much more ways to save energy.

The conclusion can be made that the future of the planet depends on reducing energy consumption and we have to change our behavior now in order to save energy in Ukraine. Other countries have already obtained a good experience in this field which should be studied by us.

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METHODS OF MINERAL DEPOSITS ESTIMATION

Among the mining and surveying problems there is an issue concerning an estimation of mineral deposits, namely the choice of the most appropriate method of estimation. Deposit of mineral resources–is that particular amount of discovered minerals which is estimated in the place of occurrence according to geological exploration of deposits.

There are more than 20 different methods of deposits calculation. These methods are used in practice depending on the forms and the conditions of deposits occurrence, the nature of changes in the content of useful components, the system of prospecting and the density of prospecting points, as well as the goals and purposes

for the estimation of mineral deposits. The most used methods are the following: arithmetic method, method of geological blocks, method of operational blocks, method of sectioning (vertical and horizontal), method of polygons.

The choice of optimal estimation method is shown on the example of Korosten' granite deposit. Analysis was carried out with three methods:

1. Arithmetic method. Prospecting holes are drilled on the area with a potential deposit; internal and external contours are built around prospecting holes. These contours divide the area into two parts: internal contour area S1 and cross - contour area S2. Estimation of deposits was conducted separately for each of these surfaces. According to arithmetic method, the volume of block was equal to 17372, 8 m^3.

2. Method of geological blocks. Average values of power and content which are calculated not for the entire deposit but for its individual parts are called - geological blocks. According to this method, the volume of block was equal to 17282, 5 m^3.

3. Method of vertical cuts. This method is based on the use of data of the ledge surveying conducted parallel to the core lines at *l* equal intervals. This method is used to determine the volume of excavated blocks with extended, almost parallel contours. Using the method of vertical cuts, the volume of blocks was equal to V=17409, 3 m^3.

The results of accomplished investigation has shown that the most accurate estimation among mentioned above estimation methods is the method of geological blocks. The advantage of this method is in its simplicity and fast performance, as well as in the possibility of making groups and categories of deposits according to certain criteria and conditions. The least accurate method of estimation at given mining enterprise is the method of vertical cuts.

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COMPARISON OF BREATHALYZERS TYPES

Today's world is based on the development of science in general. Engineering is no less developed, in which cars, industrial or household appliances are created for human needs and so on. Many of these mechanisms require a person to observe

safety regulations. Operating a technique of increased danger, for example, a car or a machine at a factory, a person should understand that it is responsible for accidents that can happen, and therefore you should always keep yourself in both physiological and psychological tone. Therefore, being sober in this situation is a necessary requirement for someone.

There are several classifications of breathalyzers.

Classification of breathalyzers by purpose:

- Professional breathalyzers - have the maximum frequency of use (from 200 to 300 times per day). In the configuration there are additional devices that are usually used in large enterprises and in the departments of the road transport service, for example, a printer that prints the results of analysis. They have a rather low error of results - 0.01 ppm.
- Special - not used as often as their professional relatives, about 10-30 checks per day. They are often used in small industrial enterprises, in medical institutions and in road inspection.
- Club - is used in many entertaining institutions, which is understandable on the basis of the name of the group. According to their characteristics they are mixes of the first types of alcohol testers;
- Individual devices are the simplest of all existing species, they can be used about 2 times a day. They are great for people who are worried about their safety and are not shy of such self-control.

Classification of breathalyzers by method of indication:

- Switchgear
- LED Light
- Digital

Classification of breathalyzers by type of sensor:

- Semiconductor, which burn alcohol vapors
- Electrochemical. Inside the sensor an electrochemical reaction occurs. There is a special reagent that reacts only with molecules of ethanol, with other substances the reaction will not occur. This is the most reliable type of sensor.
- Photometric, in which vapors of alcohol are absorbed by infrared radiation. Are the most accurate indicators. Do not wear out with time, but are the most expensive.

The comparisons were carried out according to the type of sensor. The evaluation criteria were the cost, response rate, the need for calibration, sensitivity to alcohol (measurement accuracy), depending on the ambient temperature.

The cost

Semiconductor breathalyzer is the cheapest of all. The second place on the price policy is occupied by the electrochemical. The most expensive is a photometric breathalyzer.

Response rate

Breathalyzer with semiconductor sensor has a relatively low speed. Breathalyzer with an electrochemical sensor has a high performance index.

Photometric breathalyzer is inherent in long-term analysis. Warming up before work lasts about 20 minutes. Then, each measuring procedure takes up to 10 minutes.

The need for calibration

Breathalyzer with semiconductor sensor has low stability (requiring frequent calibration). Breathalyzer with electrochemical and photometric sensor type has high stability (do not require frequent calibration). Calibration interval of the semiconductor sensor is 6 months for breathalyzer with electrochemical and photometric sensor type - 12 months.

Sensitivity to alcohol (measurement accuracy)

Breathalyzer with semiconductor sensor has low selectivity towards ethanol. Breathalyzer with electrochemical sensor has high selectivity with towards ethanol, high sensitivity and accuracy. Breathalyzer with photometric sensor has absolute selectivity towards ethanol.

Depending on the ambient temperature

Indications of semiconductor breathalyzer and photometric sensors depend strongly on the ambient temperature. Indications of breathalyzer with electrochemical sensor are less dependent on the ambient temperature.

Conclusion

Taking into consideration all above mentioned we can state that the breathalyzer with an electrochemical sensor is the best of them. Maintaining the instrument does not depend on the ambient temperature, it has high accuracy and sensitivity to ethanol

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TECHNOLOGICAL AND ECONOMIC JUSTIFICATION OF DIMENSION STONE EXPLOITATION TECHNIQUES IN UKRAINIAN GRANITE OR SIMILAR QUARRIES

Purpose. To determine the most acceptable primary-cut techniques at high-strength dimension stone deposits for Ukrainian shield conditions in terms of production efficiency. The use of these techniques would maximize the productivity of stone companies and maintain the rock mass integrity.

Methodology. The data were collected at several dimension stone deposits in Zhytomyr region. A total of several blocks with the volume 150-200 m^3 (height 3-4 m) were investigated. Trade blocks volumes fluctuated within 1-5 m^3. The primary cut of commercial blocks was analyzed, using respectively 4 alternative techniques and several their combinations. Operating costs, time expenditures, amortization, labor costs, services costs and expenditure of energy were analyzed and considered.

Findings. The parameters to be considered in primary cut technologies selection were justified. There were determined basic extraction costs, advantages and disadvantages of each technique. The exploitation costs for 1 m^3 of dimension stone were calculated afterwards.

Originality. Main primary cut techniques were justified in terms of technological and economic benefits for dimension stone quarries in the Ukrainian shield conditions.

Practical value. Data obtained in this study could be taken into account by similar dimension stone quarries in selection of techniques employed in some basins of dimension stone quarries in Ukraine. The use of offered techniques would allow to reduce the costs on primary cut techniques selection, achieve the largest stone output and the rock mass integrity preservation.

Keywords: dimension stone; primary cut techniques; diamond wire cutting; blasting techniques; chemical oxygen generators; exploitation economics.

The main conditions for the new technology success are its simplicity and low price in comparison with other techniques that have been previously used. However, the following significant aspects must be taken into account: utilization safety, universality, adaptation capability for the rock mass characteristics etc.

Primary cut is the first stage of the dimension stone production process. To assess its efficiency it is necessary to calculate the energy consumption, consumables quantity, mechanisms amortization, human resources costs that are variable depending on the technology type. The aim of the work is to assess the unit cost value for 1 m^3 of dimension stone extraction (EUR/m^3) using different techniques.

Techniques investigations were performed at several dimension stone quarries in Zhytomyr region (Kamianobridske North gabbro deposit, Chovnivske syenite deposit, Volodarsko-Volynske gabbro deposit, Osnykivske labradorite deposit). Several blocks of 150-200 m^3 were cut and then splitted into trade blocks of 1-5 m^3. Several primary cut techniques (drilling + detonating cord + black powder; drilling + detonating cord; diamond wire sawing; chemical oxygen generators «Rocksplitter») were compared. Mechanisms` amortization, human resources costs, power resources and service costs were then taken into account. The principal costs` types and mission of them are shown in table 3.

Operating costs for each exploitation technique are calculated according to the formula 1.

$$O_c = \frac{n_w * T * s_c + \sum(c_c * T_{tot}) + \sum(n_{eq} * T_{tot} * A)}{V_{block}}, \text{EUR}/_{\text{M}^3} \quad (1)$$

where: n_w – number of workers;

– time for 1 block primary cut, год;

s_c – salary for 1 worker, EUR/h;

c_c – consumables costs, EUR/h;

T_{tot} - the total operating time of each equipment unit, h;

n_{eq} - the number of equipment units;

– amortization costs, EUR/h;

V_{block} - block volume, m^3.

Primary cut costs changes for 1 m^3 of dimension stone is shown in Fig. 1.

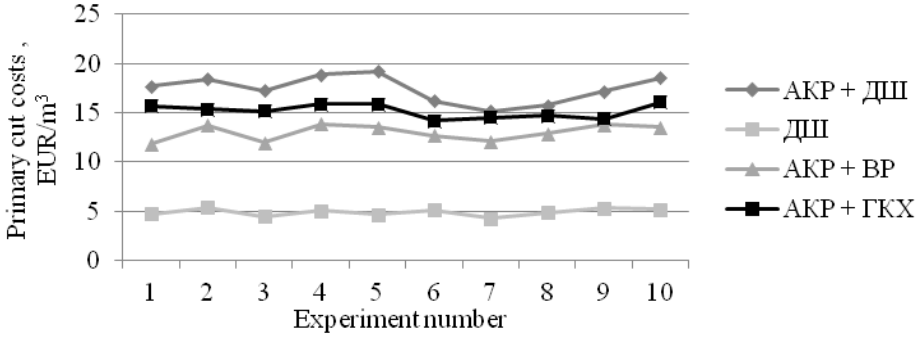

Fig. 1. Primary cut costs for 1 m^3 of dimension stone:
АКР+ДШ - diamond wire saw + detonating cord; ДШ - detonating cord;
АКР+ВР - diamond wire saw + explosives; АКР+ГКХ - diamond wire saw +
chemical oxygen generators «Rocksplitter».

Specific costs for primary cut using explosives (detonating cord) is approximately 5 EUR/m^3, while for diamond wire sawing + detonating cord the cost is 17,5 EUR/m^3 in average. The use of detonating cord (DC) is the cheapest, while diamond wire saw + detonating cord (DWS+DC) is the most expensive technique according to the chart. Diamond wire saw + chemical oxygen generators «Rocksplitter» technique (DWS+COG) is slightly cheaper, that justifies its spread at Ukrainian dimension stone companies.

Primary cut costs for DWS+DC and DC techniques are shown in Fig. 2 as a function of trade blocks value. The two lines intersection point defines a transition point in which the use of the DWS becomes more beneficial with block value decreasing in comparison with the DC technique.

The use of black powder (BP) does not provide high process automation. Hence, it is necessary to take into account the significant labor costs. In addition, the problems related to the noise, vibration and considerable separation of stone fragments limit this method use, especially in the close residential districts or motorroads allocation.

The average service life of modern diamond wires is 10-12 m^2/m in gneiss extraction. Diamond wires are not still fully competitive in comparison with detonating cord for hard rock cutting. However, there is a tendency to increase the diamond wire saw application on various technological operations [1].

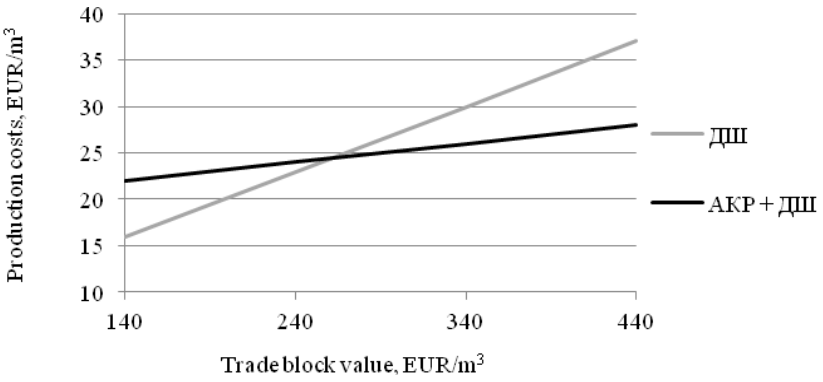

Fig. 2. Production costs change according to the trade block value

Conclusions. The explosives use is the most traditional, verified and "cheap" for dimension stone extraction. However, not only low financial costs, but also high-quality final product output should be considered, i.e. which stone volume will be really suitable for processing [1].

Comparison of the basic dimension stone exploitation techniques is shown in Tab. 1.

Table 1

Comparative analysis of the basic primary cut techniques` qualitative characteristics at dimension stone quarries

Characteristics	DC	DWS	DWS +DC	BP	BP+DWS	DWS+ COG
Surface quality	-	+	+	-	+	+
Productivity in rock mass, m^2/h	+ (7-10)	± (1-4)	+ (10)	+ (7-10)	+ (10)	+ (10)
Power consumption	-	±	±/-	-	±/-	±/-
Capital outlays	-	±	±	-	±/-	±/-
Tooling investment	-	+	+	-	+	+
Environmental impact	+	-	±	+	+	-
Waste volume (saw-cut, block surface damage), %	7-10	2-2,5	5	10-15	7-10	3-4
Mechanization level	-	±	±/-	-	±/-	±/-
Safety of works	-	±	±	-	-	±
Water consumption	-	±	±	-	±	±
Impact on the rock mass	±	-	±	+	±	-

"-" - low; «±» - average; "+" – high

Nowadays there is a need to use the techniques fitting a relatively low price and targeted for high-quality products in accordance with national and European standards in Ukraine. The low prices for technologies are often neglected in the world practice: the maximum blocks yield and minimal waste volumes are important due to the dimension stone rareness and reserves scantiness [2].

For example, Italian enterprises are sometimes forced to separate blocks of 500 m length and of 25 m^2 diameter. Production costs for such blocks could be about 500000 EUR. However, the percentage of "useful" material is obtained the highest that ultimately results in the greatest profit in the result of the trade blocks sale. Consequently, the cheapest primary cut technique is not always the best. Thus, more

sophisticated and, consequently, more expensive techniques becoming increasingly important in dimension stone sector.

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AUTOMATION OF CYLINDER-CONICAL TANK IN BREWERY

In the modern world one of the most popular alcoholic drinks is a beer. The commonest problem in Ukrainian brewing industry is control and regulation of fermentation and after-fermentation processes. Those processes occurs in CCT (here & forward – cylinder-conical tank) and most of brewing companies in our country are hiring specialists to control and regulate them. That can cause production failures and other accidents.

Our research is dedicated to improving brewery in Ukraine by making the process of fermentation, the most important part of it, reliable and qualitative.

There are two questions which our topic arises: What is the use of CCT automation? How can we improve the process of fermentation?

Answering the first question we consider following advantages:

1. Reliable and accurate options regulation.
2. Simple and fast system control.
3. High safety level.

The only disadvantage is high cost of such system and the main reason why Ukrainian brewers discard it.

Before describing our project we must consider the operation principle of CCT.

Pure wort goes through the pipes to the bottom of CCT. After the wort has been cooled completely, yeast is added to the tank. During the fermentation much heat stands out, so the wort requires constant cooling. Brewers are monitoring the concentration of carbon dioxide in the tanks during the fermentation. After the maximum level is reached, gas is pumped through the special pipes.

The controller that we use to regulate options receives data from pressure meter to control concentration of carbon dioxide in the tank. Data received from the temperature sensor is used to keep the wort and settled yeast cooled.

Ammonia vapor as a coolant circulates through the coil-pipes of cooling jackets of CCT. This type of coolant was chosen because it meets necessary requirements of temperature that it can decrease, and, therefore, the regulation process occurs more fluently.

Data received from the level meter is used to fill the vessel with the necessary wort quantity. All measured values of the options are displayed on the screen for convenient monitoring.

Final step in our research was to calculate economical profit for such expensive system as was mentioned above. Calculations that were made showed us that this kind of expenses will not be reflected in the profitability of production very much because the pay off period is not long.

All the conducted investigations have made us conclude that the designed automatic system is expediential and profitable.

UDC 622.

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INFLUENCE OF WATER PH INDEX ON TECHNOLOGICAL EQUIPMENT AT MINING BY THE HYDROMECHANICAL METHOD

In mining industry the volume of water used during minerals extraction a few times exceeds the volume of obtained rock. Technological water is contaminated not only by mechanical particles but also chemical compounds contained in rocks. The change of chemical parameters and water properties influence on the technological hydromechanical equipment.

Now, reverse water circulation is used at quarries and ore-processing plants. Technological water has a low value of pH order 3 - 3,75. The value of reverse water pH does not influence on the process of enriching but causes corrosion of equipment and pipelines, and also causes the threat of acid water leakage into adjacent water bodies with filtration water of tailings.

The aim of work is to develop recommendations on the control of pH level in technological water for increasing corrosive firmness of technological equipment and fabricated metals, as well as for reduction of negative influence on environment.

Research data showed several methods to solve the problem of negative influence of technological water pH level on technological equipment:

1) Neutralization of acid reverse water by lime. However, a reagent needs to be ground down. But this process usually does not take place at ore-processing plants and, as a result, pH level of reverse water does not exceed the value of 4-5 causing the rapid wear of pumps, pipelines and other equipment. Also there is possibility of this reagent limited supply.

2) The control of technological water pH level by ecolen. Ecolen application in tailings needs its agitation with water.

3) Methods of reverse water neutralization by soda ash. On the basis of the conducted experiments the amount of soda ash for technological water neutralization was determined. As a result, we get necessary water pH level that does not exceed 6,5-8,5.

The research data show that the most expedient method for technological water neutralization is the application of soda ash. For preparation of soda solution it is suggested to set up the equipment that will conduct and control the supply of the solution in the point of reverse water.

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IMPROVING ENVIRONMENTAL FRIENDLINESS OF PUBLIC TRANSPORT IN ZHYTOMYR BY USING ELECTROBUSES

Public transport in Zhitomir consists mainly of bus network, tram and trolleybus network. The results of the April 2016 research on passenger public transport show that 24% of passengers are transported by electric transport, 12% by road vehicles of M3category and 64% by road vehicles of M2category. In rush hours we observe road congestion in the city center, which reduces the traffic speed, causes traffic jams and increases environmental pollution. One of the solutions to these problems is the introduction of modern environmentally friendly road vehicles –

electrobuses, that would gradually replace traditional buses, with all their advantages compared to trolley buses and trams.

The research of passenger trafficking shows that the dominant number of passengers uses road vehicles of M2 category. These buses are of higher speed thanks to their maneuvering and dynamic properties compared to the trolley buses. However, the bus fare is higher and they pollute the environment.

So, the task is to exclude fuel oil road vehicles from city transport system. We consider the following options for alternative road vehicles.

1. Biofuel vehicles. The advantages include the use of renewable energy, but this option also requires proper production facilities, which are currently not available in Zhytomyr. And their construction in its turn requires substantial investment.

2. Hybrid vehicles. Their advantages over municipal electric transport include the move autonomy. Compared to the automobile transport hybrid vehicles are better because of energy preservation in unstable city traffic. However, this kind of transport does not provide absolute environmental safety as it uses ICE generator. 3.

3. Electrobuses are the most environmentally friendly road vehicles. Compared with the existing electric transport in the city, electrobuses have the advantage of independent move, i.e. they enable new routes regardless of the electric network. They also have a higher average technical speed on the routes, particularly in express motion. They are charged mostly at night when the tariff is lower.

In contrast to route vehicles equipped with internal combustion engines, electrobuses are ecological, silent and have reduced exploitation expenses, including the cost and complexity of maintenance and repair. Electrobuses are more economical compared to buses. A traditional bus spends 10 times more money on fuel per day than an electrobus does on energy. Therefore, we can conclude that the high cost of elektrobus will quickly pay off.

So, an elektrobuse is a vehicles with all the advantages of ICE vehicles. Moreover, they have lower operating costs and the lowest pollution.

It should also be noted that electrobuses have already been implemented in the city transport system of Ukraine. In 2016 Kyiv and Lviv ordered elektrobuses from the native producer concern "Electron". In Europe elektrobuses are already in use. To increase their average mileage there are specially equipped charging stops.

Taking into account European experience of electrobuses use we offer to gradually replace vehicles with internal combustion engines to elektrobuses in Zhytomyr. This will improve the standard of life in our city both economically and environmentally.

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VERBESSERUNG DER UMWELT DES ÖFFENTLICHEN VERKEHRSFAHRZEUGES DURCH AUSNUTZEN VON ELEKTROBUSSEN IN ZHYTOMYR STADT

Das öffentliche Verkehrsfahrzeug besteht in Zhytomyr hauptsächlich aus dem Busnetz, und dem Straßenbahn-Obusnetz. Die Ergebnisse der Studie im April 2016 des Personenverkehrs von öffentlichen Verkehrsmitteln demonstrieren, dass 24% der Passagiere mit dem elektrischen Straßenfahrzeug, 12% der Straßenfahrzeug Klasse M3 und 64% der Straßenfahrzeug Kategorie M2 transportiert wurden. In der Verkehrsspitze wurde die Überlastung des Straßennetzes in der Innenstadt beobachtet, es wird Reduzierung der Geschwindigkeit der Kommunikation, den Verkehrsstauungen und der zunehmende Umweltverschmutzung. Eine Lösung dieser Probleme ist die Einführung moderner umweltfreundlichen Straßenfahrzeuge, und nämlich Elektrobussen, die Busse ersetzen könnten und die Vorteile von Obussen und Straßenbahnen geerbt haben würden.

Eine Studie des Personenverkehrs, verwendet die überwiegende Zahl der Passagiere, die Straßenfahrzeugen der Klasse M2. Dies ist aufgrund der Tatsache, dass diese Busse durch das Manövrieren und dynamische Eigenschaften im Vergleich zu dem Wagen höhere Geschwindigkeitsverbindungen haben, aber dazu höhere Preise und außerdem belasten die Umwelt.

Das Problem besteht darin dass die Straßenfahrzeuge, die mit Heizöl laufen auszuschließen. Es behauptet folgenden Optionen für alternative Straßenfahrzeuge.

1. Fahrzeuge, die auf Biokraftstoff laufen. Zu den Vorteilen gehört die Nutzung erneuerbarer Energie, aber diese Option erfordert auch die Verfügbarkeit von Produktionsanlagen, die derzeit in Zhytomyr fehlen, und ihre Konstruktion erfordert bedeutende Investitionen.

2. Hybridfahrzeuge. Ihre Vorteile gegenüber dem kommunaler Elektroverkehr sind natürlich die Autonomie, aber der Vorteil im Vergleich zu der Straße die Energiekonservierung ist bei nicht nachhaltigem Stadtverkehr. Allerdings bietet diese Typ des Verkehrs keine absolute Umweltsicherheit durch die Verwendung des Verbrennungsmotors als ein Generator.

3. Elektrobussen werden durch die beste Leistung der Umwelt zwischen den Straßenfahrzeugen markiert. Im Vergleich zu dem vorhandenen elektrischen Transport in der Stadt, haben Elektrobussen einen autonomen Verkehr, die den Bau der neuen Linien, unabhängig vom Stromnetz ermöglichen. Sie haben auch eine höhere Durchschnittsgeschwindigkeit auf den technischen Routen, besonders in der verkehrsspitze. Das Laden mit Strom wird meist in der Nacht getan, mit dem Vorzugstarif.

Im Gegensatz zu den Fahrzeugen mit Verbrennungsmotoren sind die Elektrobussen ökologisch, leise und haben die reduzierten Betriebskosten, einschließlich den Selbstkosten und Komplexität der Erfüllung für Wartung und Reparatur. Es ist auch erwähnenswert, die Sparsamkeit der Elektrobussen Verglich zu Bussen. Treibstoffkosten eines Buses ist 10-mal mehr als die Stromkosten für ähnliche Elektrobusse. Daher können wir schließen, dass die hohen Kosten von Elektrobussen schnell zurück bezahlt in der Bedingung des effizienten Betriebs.

Als Ergebnis kann man sagen, dass die Elektrobussen Fahrzeuge sind, die alle Vorteile von Fahrzeugen mit Verbrennungsmotoren haben. Die niedrigere Betriebskosten und die geringsten Verschmutzung sind auch Vorteile des Verkehrs.

Es sollte auch beachtet werden, dass in den Städten der Ukraine die erste Erfahrung umgesetzten von Elektrobussen sind. Kiew und Lviv haben Auftrag von Elektrobussen dem inländischen Herstellern „Elektron“ gemacht. In Europa stehen die Elektrobussen bereits im Einsatz. Um ihre durchschnittliche Fahrleistung zu erhöhen, sind speziell ausgestattete Haltestellen.

Die Erfahrungen der europäischen Städten vorschlägt die Fahrzeuge mit Verbrennungsmotoren in Zhytomyr auf die Elektrobussen zu ersetzen. Der Ersatz von Elektrobussen wird die Umwelt und Wirtschaftssituation in unserer Stadt verbessern.

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ACCUMULATION OF ^{137}CS BY MOSS LAYER IN FRESH PINE FORESTS OF UKRAINIAN POLISSIA

As a result of the accident of Chernobyl NPP, the territory of Ukraine has undergone the contamination by radioactive isotopes, primarily ^{137}Cs. Considerable amount of radioactive emissions was accumulated by woodlands that have become a natural barrier to the spread of radioactive isotopes. The total area of radioactive contamination of the territory of Ukraine by ^{137}Cs in forests constitutes 39% of the total forest areas. [2, p. 63; 6, p. 23].

In the first years after the accident, scientists conducted a wide-ranging monitoring to assess the radiation situation in forests. Later, the researchers focused on the distribution of radioactive elements in forest ecosystems [4, p. 96; 7, p. 15]. Regularities investigation of the distribution of ^{137}Cs in different components of forest ecosystems is of great interest both in theoretical and practical aspects [3, p.134]. Mushrooms, lichens and moss accumulate ^{137}Cs by 1or 2 factors of ten more compared to its concentration in soil [4, p. 115]. Depending on the development and degree of projective coverage, the moss cover accumulates 0,08 -5,85% of the total amount of ^{137}Cs in biogeocenose. Researchers note [1,

p. 30; 5, p. 58] that the contribution of mosses to the contamination of forest ecosystems reaches 12%. Therefore, the study of mosses as the accumulator of ^{137}Cs is relevant.

The purpose of our research was to study the accumulation of ^{137}Cs by moss layer in fresh pine forests at different density of radioactive contamination of soil. The studies were conducted in 2016 in Narodychi forestry (SP №1) and Malin forestry (SP №2) in pine plantations of 95-100 years old. The density of soil radioactive contamination on sample plot №1 (quarter 58, ground 6) was 259±16 kBq/m^2, and the sample plot №2 (quarter 60, ground 8) – 5,67±0,73 kBq/m^2. Moss layer was presented by Dicranum polysetum Sw. and Pleurozium schreberi with projective cover of 85-90%. Projective cover assessment was made by using the grid of Ramensky (1m x 1m). A full cut of a moss layer was made and soil samples were taken from each square metre. The samples of moss were divided into apical portion (live), average (dead) and lower (combings). All samples were dried to air-dry state, crushed and brought to a homogeneous state. Measuring the specific activity of ^{137}Cs in the samples was performed with a scintillation gamma spectrometry device with multi-channel pulse analyzer (AI).

While studying the radioactive contamination of mosses by ^{137}Cs, it was found that the exceeding value of specific activity for Dicranum polysetum compared to Pleurozium Schreberi was observed in each sample plot. It was found that the concentration of ^{137}Cs in Dicranum polysetum on SP №1 and SP №2 constitutes 12196,5±949,3 Bq/kg and 291±16,4 Bq/kg, whereas for Pleurozium Schreberi the corresponding values are equal 6161,2±296,6 Bq/kg and 246,5±7,95 Bq/kg. The existence of significant differences between average values of specific activity of ^{137}Cs is confirmed by the single-factor analysis of variance: for SP №1 $F_{act.}=51,79\geq F_{(1;48;0,95)}=4,04$; for SP №2 $F_{act.}=4,36\geq F_{(1;37;0,95)}=4,11$. Consequently, reliable at the 95% confidence level exceeding concentration of ^{137}Cs in Dicranum polysetum compared to Pleurozium Schreberi in SP №1 and SP №2 constituted 2,0 and 1,2 times respectively.

We also analyzed the radioactive contamination of different parts (fractions) of Pleurozium Schreberi and Dicranum polysetum (Table 1).

Table 1

Average values of specific activity of ^{137}Cs in moss fractions, Bq/kg

Moss species	**Moss fraction**					
	SP №1			**SP №2**		
	live	**dead**	**combings**	**live**	**dead**	**combings**
Dicranum polysetum Sw.	12089±1106	9317±956	14770±1604	296±37	240±11	338±23
Pleurozium schreberi (Brid.) Mitt.	5220±165	4924±151	7300±407	233±7	224±10	274±10

Both for Dicranum polysetum and Pleurozium Schreberi on SP №1 and SP №2 the maximum specific activity was observed for combings – 14770±1604 Bq/kg and 338±23 Bq/kg respectively. On SP №1 the specific activity values for live and dead moss fraction compared to combings were 1.2 and 1.6 times lower; on the SP №2 the

difference was 1.1 and 1.4 times. Dead moss faction is characterized by the smallest accumulation of ^{137}Cs: for Pleurozium Schreberi specific activity constituted 7300±407 Bq/kg and 274±10 Bq/kg on SP №1 and SP №2 respectively. Excess values for the specific activity of live moss and combings fraction compared to the dead part of the SP №1 were 1.1 and 1.5 times, and the SP №2 such excess averaged 1.2 times. The results of the single-factor analysis of variance show that there is a significant difference between the average values of specific activity of ^{137}Cs different moss fractions (live part - dead part - combings) on each sample plot. On SP №1 for fractions of Pleurozium Schreberi and Dicranum polysetum $F_{act.}=14,15 \geq F_{(2;29;0,95)}=3,35$ and $F_{act.}=4,5 \geq F_{(2;18;0,95)}=3,63$; on SP №2 $F_{act.}=7,1 \geq F_{(2;14;0,95)}=3,9$ and $F_{act.}=3,96 \geq F_{(2;22;0,95)}=3,5$ respectively. It was found that the value of ^{137}Cs accumulation by moss fractions can be placed in ascending order: combings> live part> dead part.

Consequently, the results of our research, within a single type of forest-growing conditions at different density of radioactive contamination of soil, Dicranum polysetum is characterized by significantly higher levels of radioactive contamination compared to Pleurozium Schreberi (exceeding on SP №1 by 2 times, and on SP №2 by 1,2 times). Also it was found that the minimum concentration is typical for dead part of both moss species under study, and the maximum - for combings. Thus, the specific activity of ^{137}Cs in combings compared to the dead fraction for Dicranum polysetum and Pleurozium Schreberi on SP №1 was 1,6 and 1,5 times, on SP №2 - 1,4 and 1,2 times respectively.

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ADVANTAGES AND DISADVANTAGES OF WIRE SAW INSTALLATION AT BLOCK STONE QUARRY

By volume of ornamental stone reserves Ukraine occupies a leading place in the world. There are about three hundred deposits of ornamental stone on the territory of the country, the half of which is being developed. The annual production of blocks is 150-160 thousand m^3. The main source of ornamental stone is Ukrainian shield. Within its area there are about 140 deposits of granite, gabbro, labradorite with high technical and decorative properties. Generally, ornamental stone deposits can be found in all regions of Ukraine, but the most valuable types occur in Polissia - in Rivne, Zhytomyr regions, and in Zaporizhia, Zakarpattia and Khmelnytsky regions.

There are many different ways to extract minerals from massif. The most widely used methods are: by energy of explosion, by diamond wire saw, by non-explosive destructive device (NED) and by breaking off with hydrowedge.

Diamond-cut wire is the most common non-explosive method of separating rock monoliths of hard ornamental stone from the massif. This method has many advantages compared to other methods of quarrying. The advantages are: monolithic massif and blocks are not destroyed; the quality of product units (side facets are equal and opposite sides of the block are parallel) significantly improves; an opportunity to consider geotechnological features of massif and geometric parameters of working face; the depth and the height of sawing is hardly limited by the parameters of working body, on the contrary to sawing with rotatory saw reinforced with diamond segments; low impact on the environment.

Along with the advantages, this method has several disadvantages which include: high precision drilling; requires qualified personnel; constant supply of water; inability to use at high fracturing, softer inclusions and other irregularities; high cost of wire (the cost of the diamond wire on average is 80-90 dollars per meter); a large volume of drilling operations; large operating losses; working tool rejection from a given direction of drilling; rapid wear of wire due to the dynamic load at work.

For all the above, we can say that the most effective way to get high-quality monoliths is the method of sawing with diamond-cutting wire, since in the condition of correct operation, it almost does not pollute the environment if to compare with blasting. Apparently, this method requires less energy consumption as the latest generation of machines has inverter motors that change cutting speed by changing frequency. Thus, all energy consumed is directly transferred to diamond wire (drive wheel is mounted directly on the motor shaft). At the same time, the first modern wire saws for granite had mechanical change of rotation frequency which led to a rapid wear of equipment and high lost of energy (about 30% of energy spent for mechanical change of rotation frequency). The positive point of this mining method is a small cut width, which in turn can reduce exhaustion of a deposit.

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SOLVING THE PROBLEMS OF PROTECTING THE AREAS FROM WATERLOGGING AND FLOODING THROUGH EQUIPPING DAMS WITH DRAINING ELEMENT

In recent years, Ukraine has encountered an acute problem of protection against the harmful effects of water (especially flooding and waterlogging) on settlements, economic facilities and agricultural lands.

At present, a number of state targeted programmes are being implemented in Ukraine, in particular, a comprehensive program of flood protection in western Ukraine, in the basins of the Tysa, the Dniester, the Prut and the Siret rivers. In the center of Ukraine the reconstruction of hydrotechnical structures of defensive arrays of the Dnieper reservoirs is being conducted. Most dams of the Dnieper cascade reservoirs that were built to protect 197 ths. ha and the population of 600 thousand residents have been utilized for about 50 years that corresponds to their maximum period of exploitation [1]. World Bank experts claimed the investment project "Reconstruction of hydrotechnical structures of defensive arrays of the Dnieper reservoirs" to be the best for national investments in 2016 [2]. All these activities are carried out to implement the State Environmental Policy of Ukraine [3] and the Water Strategy of Ukraine. As a result of implementation of these programs in western Ukraine there has been created a set of protective flood control structures, which include 3.5 ths. km of dams, 1.2 ths. km of shore facilities, 600 pumping and compressor stations to pump excess water. But complex protective structures on rivers and reservoirs are inadequate and require significant reconstruction of existing and construction of new ones [4, 5]. Moreover, according to the national experience, to defend against the harmful effects of water with the use of engineering measures only is impossible, although they are crucial in the fight against floods. Changes in people's attitudes to the surrounding environment are necessary.

The implementation of engineering measures to protect against flooding, depending on local conditions, the nature of the river (the regime of water level, flow velocity, etc.), landscaping can be done in the following areas:

1. diking of the area by building dams;
2. regulating of the river stream to increase its capacity and lower the water level within the populated area;
3. regulating of the river flow by building flood control reservoirs and dry containers;
4. artificial increasing of the areas relief to uncovered marks.

These are the main trends of state targeted programmes in Ukraine are aimed at solving the problem of protection from the harmful effects of water [4]. However, they are associated with the implementation of substantial quantities of earthworks, construction of special protective structures on the designated lands, and therefore call for comprehensive analysis and feasibility studies, selection of the most appropriate and affordable options of protection.

In case of broad flooding area, the protective dikes are constructed. They can be uncovered and flooded. The crest level of the uncovered dam should be higher than the maximum level of flood water of estimated frequency. The width of the dam crest is taken 4.5 meters, providing the passage of operational transport. Flooded dams are arranged for temporary protection of agricultural lands only during the spring floods. During the period of growing crops and summer-autumn floods, the overflowing of water through the dam crest is not allowed.

Dams, depending on application area and floodplain topography, can protect one or two banks. Protective dams on both banks of the river are arranged under the conditions when the river flows through a settlement, and the banks are low. Such bilateral dams are built on the rivers Tysa and Siret.

The experience in the construction of protective flood control structures shows that the most economical are soil and stone-cast dams, built from local materials, which significantly reduce construction costs [5].

However, the soil dams during their prolonged moistening from the part where there is water, are subjected to washing out of the soil smallest particles that leads to natural aging of dams and reducing its reliability. In the course of their operation the soil dams can be subjected to deformation and destruction. The biggest risk here is filtering and wave forwarding, causing breakouts, landslides and other damages. A large number of bulk dams in Ukraine were built over 20 years ago and need restoration of the project profile and repair of varying difficulty [6]. About 40% of soil dams are in poor condition, about 30% are dangerous. The main reasons for this situation are:

1. sinking of dams body and foundations, large deformation, destruction of the coast;
2. thinning, erosion and (or) the destruction of slopes;
3. occurrence of cracks that appeared as a result of uneven subsidence of dams body, poor laying of soil, using soils with different properties, freezing of upper facilities, the impact of earthmoving animals;
4. mechanical, chemical and colloidal suffusion and bulging of soil, deterioration of the properties of the material and structures in the course of time;
5. destruction of slopes consolidation structures;
6. filtering through the base and body of the structures;
7. violation of normal functioning of the structures because of the delay of water passes through the conduit elements and their consequent destruction under the water overflow through the comb structures (incl. large floods);

8. deformation and destruction under the influence of anthropogenic factors.

The world and domestic practice has a series of engineering measures that can be used in the reconstruction of soil dams to protect surrounding areas from waterlogging and flooding.

In particular, to reduce the filtration when protecting the areas by means of diking, you can use a dam equipped with drainage-screen module (DSM). The special design used for the reconstruction of dikes (DSM) is placed from the side of the bottom slope of a dam, module drain is placed from the side of the slope and the screen is located behind the drain and reaches the soil surface), surface and filtration water flows are trapped and, consequently, the filtration resistance of the structure that prevents suffusion processes from the tailrace of the dam is increased [7].

The scientists of the National University of Water and Environmental Engineering suggested another engineering solution to protect the areas from waterlogging and flooding that are aimed at improving the stability of filtration facilities and avoiding the suffusion processes of the tailrace. By equipping the dikes with a drain element, the filtration water flows are captured both in the body of the dam and under it. The drain element is placed from the side of the slope bottom of the dikes. As an element of draining, geotextiles with different surface density can be used, in which the filtration rate is much higher than that of the soil in the dam body. In addition, the filter element is hydraulically linked to the drain dug in the ground from the side of the tailrace drains [8].

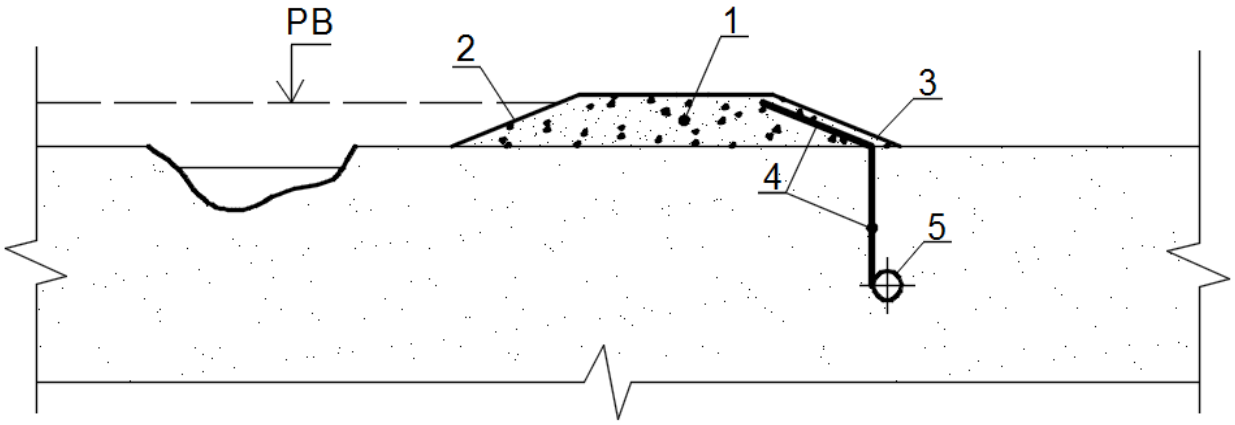

Fig.2. The dike equipped with a drain element:
1 – dike, 2, 3 – upper and bottom slopes;
4 – drain element; 5 – drain

The draining element being placed from the side of the bottom dam slope, ground water flows in the body of the dam and under it are captured by the drain, and due to the fact that its filtration rate is greater than the rate of filtration of soil of the dam body, the ground water that got into draining element is directed to the drain and, as a result of hydraulic connections, gets into it. This allows you to fully intercept the seepage that did not come out to the surface through the lower slope and the surrounding area, making suffusion processes impossible.

The suggested dike with a drain element, in most cases, provides better protection of the surrounding areas from waterlogging and flooding than conventional dam construction.

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RECYCLING SAVES THE EARTH

Today waste is a huge problem faced by humanity. With the growth of the human population on Earth is becoming more and more rubbish. However, it's very difficult to get rid of negative impacts. Not every method of getting rid of garbage is really good. The only really noteworthy way to cope with this problem is recycling.

Waste is an undesired material or substance. It may consist of the unwanted materials left over from a manufacturing process (industrial, commercial, mining or agricultural operations) or from community and household activities. Recycling is the process of making or manufacturing new products from a product that has originally served its purpose. If these used products are disposed of in an appropriate, environmentally friendly way, the process of recycling has been set in motion [2].

Recycling helps extend the life and usefulness of something that has already served its initial purpose by producing something that is useable. Recycling has a lot of benefits and importance not only to us humans but especially to our planet [1, p. 2].

Recycling can help people and save the environment as well. Its importance can be observed in many different ways. Recycling different products will help the environment. For example, we know that paper comes from trees and many trees are being cut down just to produce paper. By recycling it, we can help lessen the number of trees that are cut down.

Recycled plastic bottles are an indispensable and ubiquitous part of our lives. They are light in weight and almost unbreakable when used for their designed purpose. This is also the reason why plastics and plastic bottles account for a large part of the waste generated by our throwaway society. Plastic bottles are the most recycled plastic items but still the recycle rate is only about 24 percent [1, p. 3, 7].

Recycling helps to reduce global warming and pollution by saving energy in industrial production through recycling, the greenhouse gas emissions from factories and industrial plants are lessened and the use of fuels that emit harmful gases during production is also minimized. Recycling non-biodegradable waste (rather then burning it) will contribute a lot to help reduce air pollution and greenhouse gases that depletes the ozone layer [2].

Recycling provides ways to save money. You can sell recyclable materials to organizations that are willing to buy it. Using products that are recycled lessens expenses. Products that are made from recycled materials are less expensive than products made from new materials.

Even at home, you can recycle biodegradable waste like eggshells, vegetable and fruit peelings and use them to fertilize plants. By doing a little research and

getting creative you can save money and trips to the market while being kind to the planet.

As the population of the world increases recycling is becoming increasingly more important. Our technologically advanced societies are creating more and products and packaging that look good and are indestructible, but can take centuries to break down.

In order to combat the rise of factors that are produced by non-environmentally conscious groups, it is up to the growing numbers of individuals and companies that want to inhabit a healthier planet [2].

Many countries like Italy and Australia also offer tax advantages and subsidies to schools and companies that have recycling programs and that use alternative forms of energy to run and grow their businesses. Legislation is even in motion to promote green and sustainable living in developing countries. There are four recycling plants in Ukraine. But it's not enough for population in more than 40 million people. We recycle different things that to save money and shorten landfill sites. The schools teach children how to recycle plastic bottles, cans and paper [2].

Each of us needs to take an example to save our planet. Do not underestimate your role in such an important matter. Only through joint efforts we can succeed in saving the Earth.

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WORLD OCEAN IN DANGER

The ocean is the beginning of life of all living organisms on the Earth. It was from there came the first plants, the first microorganisms that subsequently evolved and we can see them now.

Millions of years spent in the nature of the fact to create all conditions for life. Initially, our planet was dotted with volcanoes. It was nothing of the living. As a result of the evaporation the first clouds appeared, and then the first rains. When, they began to fill in our Earth with water for many years, which will soon become the first seas and oceans. During many chemical processes, water had warmed. The primitive algae appeared. They, in turn, performed a function of photosynthesis whereby our atmosphere began to fill with oxygen. Then, the first simple organisms that exist

today had appeared. Remember the rock off the coast of the seas and oceans. This is the result of long-term skeletons protozoa deposits.

From the moment when people started to use the ocean for the extraction of resources and partly of water, they formed the opinion, that they are infinite. Unfortunately, this illusion exists today.

Fishing occurs regularly and in large quantities. This breaks the natural balance significantly. Some species of marine life are on extinction. Technological progress allowed millions of tons of water to pass through the network, capturing any fish, dolphins, whales, sharks. The story is full of cases when the ships were drowning because of too heavy a load of caught fish.

Invasive species in the ecosystem are animals or plants that did not originally live in it, but came into it thanks to people or because of a hurricane, flooding and so on. Invasive marine species cause significant damage to the ecosystem around the world. Such species as lionfish, zooplankton, pacific jellyfish and even modest starfish violate food chains and lead to the extinction of marine plants and animals. When the food chains are destroyed, the entire ecosystem can collapse. These processes occur in the oceans around the world and so far have no signs of slowing down.

Another negative effect on the ocean is the sunblock. Of course, in comparison with previous threats, a sunblock is a trifle. Meanwhile, some tanning agents are dangerous for coral reefs. A small amount of sunscreen does not seem to be a real threat, but if it is multiplied by tens of millions of swimmers who bathe in the ocean every day, there will already be a more significant amount.

What about oil? Anyone who would like to seize the oil wells as it is profitable. But did you know that oil is the result of the decomposition of dead organisms that lived millions of years ago.

Ocean pollution is no less important problem. Due to the naive illusion humans are polluting the waters of the ocean with household waste and hazardous chemical substances. Currently, the ocean fauna is the most affected. Plastic is one of the greatest and one of the worst inventions of mankind. Plastic particles resemble zooplankton, and jellyfish, turtles and fish can take them for food. A large number of durable plastic (caps and rings from the bottles) are in the stomachs of marine birds and animals.

In the world there are as many as five garbage islands that float in the ocean. Due to currents, every day they add new garbage from different continents. The largest of them is in the North Pacific current system. The concentration of plastic in it is incredibly high. Approximate dimensions of its area is from 700 000 km and more.

One of the things that complicate the protection of the ocean is due to the fact that it is difficult to understand what processes occur in its depths. We do not see the damage from catching fish by trawlers, who clean up everything on their way with their networks. We do not see the negative impact of the huge amount of waste and pollution that are dumped in the sea every day. But we are seeing the disappearance of coral reefs, seaweed and mangrove forests, which are being destroyed thanks to forward progress.

And this is just some of the problems what is happening to our oceans. Unfortunately, the authorities do not tend to focus on environmental issues because it is not economically profitable. It remains to hope that people do not reach this situation until the last moment and take decisions in a short time.

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SPHERICAL TYRES FOR SELF-DRIVING CARS

Nowadays it is difficult to imagine life without cars. Perhaps the future is not possible to imagine this part of our everyday life.One of the key elements of their design is elastic membrane installed on the rim of the wheel of the vehicle. In other words, it is a tyre. Pneumatic tyres are filled with air or any gas under pressure. Depending on the method of sealing the pneumatic tyre is produced in a chamber or a tubeless version.

The quality and condition of the tyre affects the car's operation, its stopping distance, speed, load and rolling resistance.

Load Index is a car's ability to bear the cargo, passengers and its own weight. Speed Index determines the speed limit when the tyre can operate safely.

During movement of a vehicle wheel brakes because some amount of energy is spent by the tyre for deformation as a result of spot contact displacement. This energy is subtracted from the kinetic energy. Rolling resistance can make up to 25-30% of energy consumption. However, this percentage is largely dependent on the speed of the vehicle. The index is low at high speed.

The main cause of an accident is the loss of control of the car which is directly connected with the tyres.

The company "Goodyear" presented a conceptual "smart" tyres Eagle 360 Urban for self-driving cars at the International Motor Show in Geneva. Their installation is possible only on vehicles with magnetic levitation. It is possible to achieve a new level of driving and safety and comfort for the driver and passengers due to the unique shape of tyres They have a spherical shape and can rotate in any direction. According to forecasts of the company a market of self-driving cars is to be about 85 million units annually by 2035. They conclude that the use of tyres of

unusual design will be one of the most promising innovations. They will be produced according to an individual design using a form of additive manufacturing technologies – 3D-printing, for example, their properties will be set depending on the location of the car and driving style of its owner.

Each tyre is a single mechanism with the electric motor and battery, and the voids are filled with reinforced foam plastic. They will rotate around their axis adapting to different weather conditions and road surface changes (driving on gravel or ice) and respond to them. Apart from increasing the smoothness control and maneuvering such shape of tyres also enables the car to move sideways.

The main idea of this concept is to provide tyres with artificial intelligence and functions of data exchange with the car, other road vehicles and the environment. To make driving more efficient and safer sensors will be integrated into Eagle-360 to monitor the condition of the road surface and can react to obstacles that may arise. Also, the tyres will transmit data about level of their deterioration and damage to the central control system of self-driving car information on the extent of its deterioration and damage. In addition, the tyres can receive data about traffic and location of the vehicle in real-time.

The tyre is able to choose the best course of actions and make decisions because it will be able to combine different data sources using a neural network based on algorithms of deep learning and process their parameters efficiently. Eagle 360 has self-education i.e can optimize the order of responses to the same conditions based on stored information about the actions that have been performed before thanks to the technologies of artificial intelligence.

The tyre has a capacity for a transformation i.e.the expansion and compression, since it is covered with bionic membrane made of superelastic polymer similar to human skin. Foam filler which retains its flexibility under this membrane and is strong enough to withstand the weight of the vehicle.

In case of damage of bionic membrane covering the tyre tread sensors will be able to find a puncture.When discovering the damage the tyre returns so that the puncture can not fall into the area of contact with the road surface. Moreover, the tyre has the ability to delay opening independently due to the innovative properties of the material.

Spherical Goodyear tyres have a tread pattern that resembles a natural surface structure of brain corals. Voids in tread surface are filled with the special material with properties of natural sponge. It will absorb water and then throw it through centrifugal force preventing the creation of aquaplaning effect i.e. total or partial loss of grip on wet surfaces.

A special system drives that work like human muscles by moving individual sections of the tread is located in the outer layer of the tyre. As a result of their actions tyre surface changes according to weather conditions. Detecting moisture the number of grooves increases and membrane is "smoothed" on the dry coating.

As the wheel in the shape of a ball is able to turn to 360 degrees and future technology may allow narrowing parking spaces, since cars equipped with spherical tyres need less space to maneuver.

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INFLUENCE OF THE RATIO COMPONENTS ON ^{137}CS PENETRATION INTO THE ROE DEER ORGANISM IN AUTUMN

After the Chernobyl accident in 1986 the total radioactivity of substances fallen out of the reactor into the environment is about 300 MCi. Kyiv and Zhytomyr regions are the most contaminated areas of Ukraine. By 1996, forest soils with ^{137}Cs contamination density of above 37 kBq/m^2 (1.0 Ci/km^2) occupied almost 440 thousand hectares in Zhytomyr region.

Due to the accident, a significant amount of radionuclides penetrated various parts of food chains in forest ecosystems. Food chains involving herbivores were the most severely affected. Particular attention is paid to the roe deer which serves as an indicator of radioactive contamination.

A number of studies of wild animals contamination were held in Polissia. The data show that the levels of radioactive contamination of wild animals remain high even long after the Chernobyl accident. They also established significant seasonal differences in ^{137}Cs accumulation in muscles associated with feeding behavior of animals.

Sweden was one of the first to record the excess of ^{137}Cs in meat of wild ungulate animals. It was proved that in some regions ^{137}Cs specific activity in the period of initial fallout exceeded permissible level (1500 Bq/kg at the time) in muscles of roe deer. In 1987 and 1988, the average ^{137}Cs specific activity in muscles of roe deer reached almost 12 000 Bq/kg in some regions. The increase of specific activity from 1000 – 3000 Bq/kg to 11800 Bq/kg was observed in muscles of roe deer in 1988.

Taking into consideration that hunting season coincides with the peak of roe deer muscles contamination, this can cause products contamination and lead to the increase of internal exposure of consumers of wild animal meat.

All researchers think that the features and structure of animal diet affect seasonal variations of ^{137}Cs penetration into roe deer organism. Autumn is the most representative season when studying the patterns of ^{137}Cs accumulation in roe deer organism. Roe deer diet is characterized by considerable diversity in species composition. Its structure is determined by the environmental conditions of habitats and has significant seasonal differences. In Polissia, browsable forage is a part of roe deer diet. The consumption of mushrooms, ferns, mosses, as well as lichens and forest fruits is seasonal and depends on the variety and a sufficient amount of basic feed.

Contamination of forage primarily depends on the density of soil radioactive contamination by ^{137}Cs. Comparative calculations of soil radiation contamination density by^{137}Cs in the same research area in1996 and in 2016 indicate a tendency to reduce the activity of radionuclides in soil approximately by 2 times (in 1996, the average value of soil radiation contamination density on this territory was about 221±57 kBq/m^2, and in 2016 – 116±35 kBq/m^2). It should be emphasized that according to many researchers, physical decay is the only process which withdraws radionuclides outside the ecosystem.

Analysis of the study results on radionuclides content in the components of roe deer diet in 2016 indicate that the value of ^{137}Cs concentration in shoots of plants depends on their type. Only 8 of 13 forage species make 99 % of ^{137}Cs content in roe deer diet in the forests of Ukrainian Polissia. The main contributors to diet contamination are: heather (35 % of total ^{137}Cs content diet), blueberries (14,3 %), aspen (14,3 %) and oak (shoots 10,9 %, acorns 12,2 %).

Some changes in contamination structure of roe deer diet occurred 20 years after the initial study. The increase of heather contribution by 14,1 % and acorns contribution by 10,4 % in total activity of diet was observed. The contribution of aspen shoots (by 13 %) and oak (10 %) decreased. The contribution of such components as birch, blackberry, blueberries and mushrooms into diet contamination leaves almost unchanged.

Thus, some changes in contamination structure of roe deer diet occurred 20 years after the initial study. The total contamination of roe deer diet is formed both by forage with a high content of radionuclides, and by those that are consumed in large quantities and have average ^{137}Cs specific activity. Although, there was a significant reduction in ^{137}Cs forage contamination, but the content of this radionuclide is still high in soil and in plants which, in turn, leads to contamination of roe deer body.

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RESOURCE-SAVING AT CRUSHED STONE QUARRIES

European integration of Ukraine:

Earthmoving-vehicle complex is the most common complex in quarries as the primary means for the extraction of crushed stone. Drill-explosive shattering is used to prepare rock for extraction. When crushing rocks by explosion is efficient, loaders can be used for loading rock mass instead of excavators. Operation of loaders is especially effective at low altitudes of shoulders or at lower areas of rock shortpile. Today, manufacturers are more interested in application of mobile crushing and sorting machine. Currently, the EU mobile machines successfully replace stationary crushing complexes. With regard to the production of crushed stone it is applicable only at companies with small amounts of rock processing. They can reduce the amount of overload and raw materials transportations from working face to stationary crushing and sorting plants. Therefore, it can reduce the cost of mining and decrease emissions into atmosphere.

The issues on the rationality and effectiveness of these schemes application at specific companies arise while studying the problem of finding efficient technological scheme of mobile crushing facilities.

Mobile crushing complex has several advantages compared with mineral processing workshop: complete independence from the electricity mains; great maneuverability of the complex; it occupies a small area; easy to operate; it is

operated by only 2 people (operator and his assistant); relatively low cost for maintenance works; it works on the internal combustion engine.

Mentioned above mobile complex will reduce the cost for transportation of rock mass and improve the ecological condition in quarry.

Considering the features of modern market economy, when wrong decisions on major capital investments can lead to bankruptcy, scientific study and systematization of technological schemes of open cast mining at crushed stone extracting quarries using mobile crushing systems and recommendations for their use are particularly important. That is why the question of the choice of mining equipment is important.

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PROVODING RELIABILITY OF FODDER PREPARATION AND FEEDING MACHINES

Among the large number of machines which are used in livestock there are fodder mixing machines and feed distributors which occupy an important place in farming. If to take into account the high complexity of processes in livestock and the requirements of continuity of technological cycles of preparation, dosage and feeding, it becomes evident the urgency of this issue. One of the important and urgent tasks in cattle breeding of Ukraine is to create conditions for the full-fledged feeding of the cattle. In the last years, the balancing of feed rations with the aim of obtaining high milk production and growth of meat acquires importance. Most of the livestock enterprises of the advanced countries of Western Europe and the United States have switched to the mixing system of feeding, using modern technical means for the preparation and feed distribution [1, 2].

In the last years, for the preparation and feed distribution for the cattle, self-propelled and trailed funds from supplier firms which are in Italy, Sweden, Germany, the USA, Belarus, Russia and other countries come to Ukraine [1 - 3]. It should be noted such Italian companies as “Scariboldi”, “Seko”, Norwegian “Kverneland”, Swedish “DeLaval”. The analysis shows that the production of presented analogs is

established in Poland, Russia and Belarus. The production of feed distributors of the Swedish company DeLaval Optimix has started in Poland.

Over the past decade, for loading, grinding, mixing, dosing and feeding were effectively introduced self-propelled and trailed funds. Their cost is not always available for agricultural producers in Ukraine. Today, owners and users of these machines, along with economic issues, matters of design, technical characteristics, operation and storage rules, are interested in questions of their reliability in the process of operation and questions of their servicing.

As it known, a considerable number of fodder mixing machines are used today not only with individual faults, but also with significant deviations in the adjustment parameters of the technical components and mechanisms condition. Sometimes, it is very difficult rationally set the work term and service intervals of the machine, choose methods of assessment of technical condition and ways to ensure their operability.

To solve the problems of ensuring the reliability of the "DeLaval" fodder mixing machine, a structural scheme of the reliability of the grinding-mixing mechanism [3] was developed, as a subsystem which most of all limits the reliability of the machine. The structural scheme of reliability includes not only the direct elements which provide the operation of the grinding-mixing mechanism, but also provides for the possibility of various methods of reserving. For instance, displacement of round 120^0 knives; replacement of operating parts from a set of spare parts; components restoration in case of loss of operability. Let's consider ways of operability ensuring of other subsystems of the mixer fodder machine, using experience of use, maintenance and repair, elimination of failures and machines storage for the preparation and distribution of feeds. We have formed the structural schemes of the feed loading mechanism reliability of the "DeLaval" fodder mixing machine, as subsystems, which limit the reliability of the system (Fig. 1).

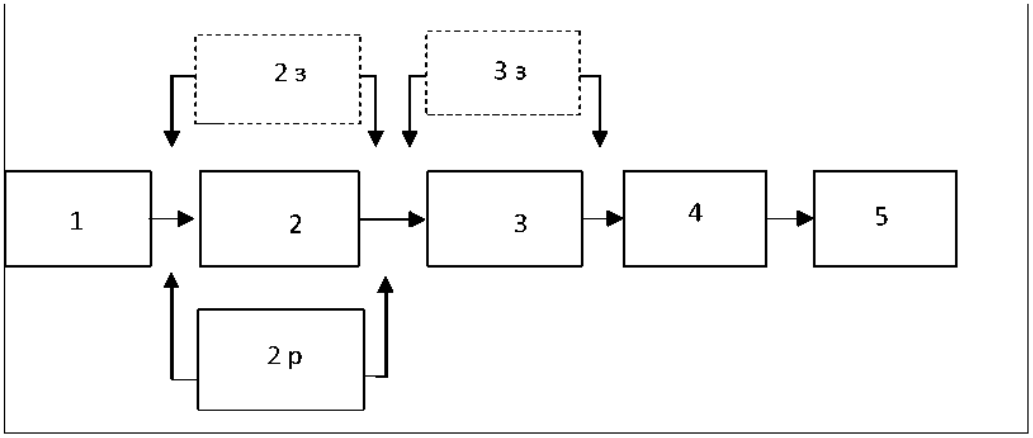

Fig. 1. Structural scheme of the reliability of the loading mechanism: 1 - drum shaft; 2 - blades; 3 - drum shaft bearings; 4 - reducer; 5 - boom of the drum.

The analysis of the loading mechanism reliability is presented in Fig. 1. The structural scheme shows that only two elements provided by spare parts - drum shaft bearings and drum blades. In addition, for the blades of the drum, as a way to ensure the operability, is provided sharpening. That is, to implement the structural scheme, it

is required the use of recovery operations, the introduction of an unloaded reserve for elements that limit reliability.

Thus, the analysis of the peculiarities of operating conditions has been carried out. Elements that limit the reliability of feed loading mechanisms have been identified. The presented structural schemes of the mixer mechanisms reliability allow us to consider ways of ensuring their operability by using possible ways of reservations. Promising in this direction could be researches aimed at using graph theory to optimize the structure of complex systems from the standpoint of reliability.

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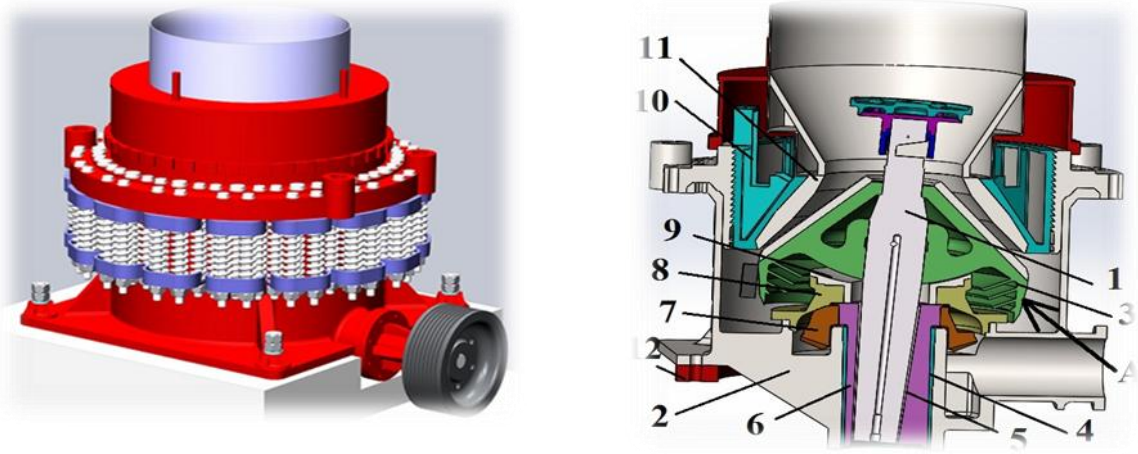
DYNAMIC STUDY AND BALANCES CONE CRUSHER SMALL CRUSHING ENVIRONMENT IN SOLIDWORKS MOTION

For coarse, medium and small crushing in nonmetallic industry, mainly used cone and jaw crasher. The problem of cone crushers is that unbalanced construction creates a large force, so it is advisable to structurally balance on the construction stage crusher to reduce the impact on the foundation and other equipment.

By definition, the balance is characteristic mechanism, which should not depend on the operating mechanism of external forces. Fully considered a balanced mechanism in which the main vector and main moment of inertia forces are zero. If the external forces are reactive, then the equation will only balance the inertial components as defined by the parameters of inertial mechanism - the masses,

moments of inertia and the law of motion. In this case, the inertial components will depend on the size-mass characteristics crushing cone 1 (Figure 1, B), the frequency of rotation and geometrical parameters in building installations crusher 2 (Figure 1, B).

Considering today requirements for shortening the implementation stage design work requirements with simultaneous improvement of their quality, are important issues for effective construction technologies based on the use of CAD / CAE-systems. Therefore, in this paper is relatively dynamic balancing forces and moments cone crusher KMD-1750 model (Figure 1 a) in the module Motion software SolidWorks.



a) b)

Fig.1. Solid state 3D model cone crusher KMD-1750 (a) and adapted its model to study the dynamic module in Motion (b) 1 - cone movement; 2 - the crusher housing; 3 - the case of movable cone;
4 - intermediate sleeve; 5 - tapered bushing; 6 - eccentric; 7 - bevel gear drive cone; 8 - bearing cup; 9 - thrust bearing; 10 - fixed cone; 11 - real armor cone; 12 - flange for gathering the dynamic loads.

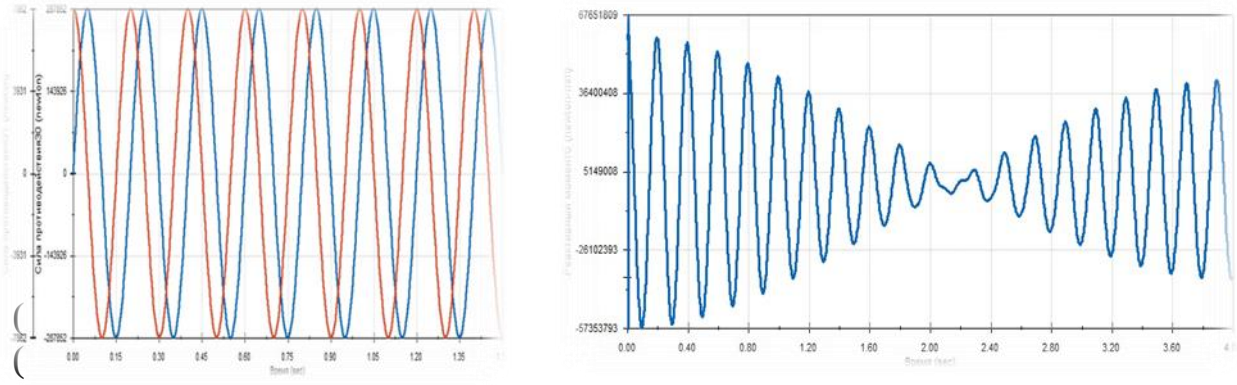
Features of the adapted model.

Due to the fact that the crusher consists of 350 parts 120 configuration for calculating required significant hardware resources and considerable computer time. To improve the efficiency of research crusher model was adapted for dynamic analysis environment Motion. The main difference between the adapted model over the original is still the majority of parts were settled through the appropriate commands to the context menu items of wood construction. Left was only the parts that are connected with moving parts, and some other visualization construction.

To reduce the amount of information the flange 12 brought to a state of **"Recorded"** and all other components / parts brought into the state of **"liberated".** Conjugation between the parts that do not perform movements relative to each other, interface changed to **"Reported".** All other configuration removed or canceled. Left only interface **"concentric"** between the intermediate sleeve 4 and eccentric 5. This is because the fixed coupling parts usually contain redundant connections that can be interpreted incorrectly system, which in turn can reduce the accuracy of the study.

For ease of determination counter reaction housing in accordance with the recommendations that are contained in the literature (Alyamovskyy AA " Engineering calculations in SolidWorks Simulation"), the design was further introduced flange 12 (Fig.1.), Which is connected with the body via two configuration, namely: coincidence between basic vertical planes and alignment. This should ensure that minimal problems «Collect» dynamic forces occurring in the system.

Between the housing and movable cone 3 thrust bearing 9 formed 3D for the following parameters: material parts - Steel (Greasy); friction parameters - ν_k = 10.16 mm / s, μ_k = 0.05; elastic parameters - set to "impact" for which rigidity is 1000000.00 N / mm, maximum damping - 49.91566312 N / (mm / s); maximum penetration - 0.1 mm.



(a) (b)

Fig.2. The results of the study of dynamic balancing power crushers in (a) and in points (b).

Setting research analysis module movement in Motion: the study - 1.5 seconds; the number of frames per second - 100; type integrator - GSTIFF; maximum integrator step size - 0.01.

After analyzing the team through «Results and Plots» dependency diagrams of the forces of reaction time (Figure 2, a). After receiving value unbalanced force 287,852 N dependence on m = P / (ω ^ 2 R) defined the approximate mass to constitutes 316 kg (compared cone the hull mass 5850.87 kg). After fixing a balancing mass (from structural considerations Balancing mass was slightly reduced) on the housing cone and after a study received reaction force constitutes 7862 N. But at the same time there is a significant imbalance in moments. To investigate the optimum placement distance balancing mass relative to the moments of intersection of the main central axis of inertia moment and the axis of rotation of movable cone was provided mobility balancing mass along the axis of the cone shell moving without changing radial distance from the axis of the cone. Additionally was created linear motor, which has moving balancing mass during rotation of the cone. The engine was moving at a constant speed, and movement performed by 400 mm by 4 seconds. Results of the study depends reactive moment of time relative to the flange shown in Figure 2, b.

The result of research moment of reactive showed that the 2.20 second of reactive size of moment practically zero. With proportions determine what time of 2.2 seconds corresponds to moving of 220 mm. However constructively balancing to raise size can not be calculated, on the other hand on the basis of the study found that the more appropriate is the placement of the balancing mass on the housing of movable cone and not on the bevel gears drive crusher. Realization A. A. Alyamovskoho modified algorithm for dynamic balancing of crusher cone crushers reduce the size of imbalances 287 852 N to 7862 N. As a result of this work shows the features of realization dynamic balancing cone crusher KMD-1750 in the environment motion and reasonable change design parts crusher to balance construction.

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POLLUTANTS OF THE SEA OF AZOV

The Sea of Azov is semi-enclosed sea of the Atlantic Ocean in the East of Europe. It is the shallowest sea in the world: the depth does not exceed 13.5 m, the average depth of about 7.4 m [2].

This sea is gentle, warm, calm and shallow. It attracts thousands of tourists every summer. The fishermen like to fish in its gentle waters. The favourite species of fish are bullheads, flatfish, pikeperch and many others. The people like this sea very much and harm the flora and fauna of it at the same time.

The first and most important factor that contributes to pollution of the Sea of Azov is flowing into the reservoir of the river, which receives industrial waste and household water. At the same time, this sea is one of the most productive seas in the world, but these days it almost lost its main purpose – fishing. In recent years, the concentration of rhodanite in the reservoir exceeds norms by 12 times, and the content of phenols increased by 7 times [2].

The main pollutant is "Azovstal", which is annually dumped into the sea more than 850 million cubic meters of waste, which is 99% of the total discharge of pollutants. In particular, December 1, 2014, the plant dumped into the sea 86118.3 m^3 of wastewater. The effluent is observed exceeding the maximum permissible concentration (MPC) of nitrogen ammonium to 2.74 times, the total iron 4 times, copper - 2.26 times, zinc - 1.76, oil products - 2.26 times. Close contaminant is Mariupol Sea trading port. Worried environmentalists steady growth in volume of

sulfur overloaded in Ukrainian seaports. In the port of Mariupol overload of sulfur in 1998 - 2000 years increased by more than 2.5 times and reached 2 million [2].

With regard to waste, in areas of the coast of the coast system, purification and supply of purified water are in very poor condition, because some of them were built about a century ago. In some residential areas sewerage systems, followed by the purification of waste water, non-existent, so the sea is polluted through the river water.

Besides, not less important factor having an impact on the pollution of the reservoir, are the oil and the oil itself. As a result of maritime traffic and activity in the ports of the Sea of Azov dumped thousands of tons of fuel oil, sulfur and oil. This leads to unprecedented contamination of the bottom of the reservoir, offshore islands, as well as the death of the huge number of fish, mammals and birds, many of which are listed as endangered.

It is necessary to apply a set of measures to smooth make worse ecological status of the Sea of Azov. These measures are dependent not only on the large industrial enterprises, but also from each person in particular. The range of these measures should include:

- priority change in the development of the seaside (enhancing control over the activities of transport and shipping ports, reduction of hazardous cargo on board ships in the Sea of Azov, the structure of innovative wastewater treatment plants);
- significant decrease of irrevocable water consumption and increased river flows;
- adjustments in agricultural activities along the coast (minimization of crops that require chemical additives for growing (pesticides);
- significant increase in land and water areas that require additional protection in order to preserve the gene pool and the Eco Fund [1].

It is obvious that nowadays the Sea of Azov is in great danger. If in the nearest future not to take certain measures, the sea will perish, flora and fauna will die. It is necessary to reduce the catch of fish, or to prohibit it for not less than five years, as well as to reduce the amount of emissions and clean them with newer and more powerful equipment.

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UDC [662.63] (477.54)=111

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RESOURCE PERSPECTIVES FOR BIOMETHANOGENESIS TECHNOLOGIES INTRODUCTION IN KHARKIV REGION

Biomethanogenesis is the process of biomass organic compounds transformation into biogas by means of methane generating aerobic microorganisms. The coefficient of biomass energy transformation into the methane at this process reaches 80%. The process of biomethanegenesis is being accomplished due to methane generating microorganisms being identified from 30 to 50 kinds. Such a symbiotic group due to its ability to change its fermentation ways functions as self-regulated system maintaining optimal values of pH, redox and thermodynamic potential in reactor.

Biogas generating is effective method of pus and biomass of other origin utilization providing ecological equilibrium. By means of bioconversion it is possible to decrease negative effect of livestock wastes on the environment as well as to get various products being alternative energy source, organic fertilizer, forage additives. Most effective and perspective from the point of view of energy-saving andsafety environment safety is complex livestock and plant growing wastes processing, applying biotechnological method - methane fermentation, introducing of which enables to decrease contamination of environment.

The *purpose* of the article is to research technologies of a biomethanogenesis in Kharkiv region.

Major advantage of biogas is in its ability to be a renewable energy source. Its production may be for so long as existence of life itself on the Earth. According to statistic data for recent years the volumes of agricultural crops having been grown as well as the number of farm animals increased. That also testifies the increase of organic wastes of farm production that can be used for production of biogas. Kharkiv region is one of the largest ones in the country as for the volumes of farm crops growing and farm animals raising. Thus, it is expedient to introduce technologies of biomethanogenesis enabling to solve the problem of organic wastes utilization in region. According to statistics data obtained in 2015 total number of livestock made up: for cattle -196000 heads, pigs – 300000 heads, ship and goats – 74000 heads, poultry -7485 heads. In total -8055000 heads of farm animals. The output of biogas from pus being formed for a year on livestock farms of region complexes makes up 186374,384 m^3. The most profitable trends in the course of biogas producing is poultry farming and pig-raising [1, c. 56].

Plant residues of farm crops can also be used in technologies of biomethanegenesis whe producing biogas. Gross yield of basic products of plant-growing in region makes up: for wheat - 2198,6 thousand t, barley- 438,5 thousand t, corn 1427,9 thousand t, sunflower - 1172,2 thousand t, potato -1029,0 thousand t. Having analyzed the results and checked calculations the conclusion was made, according to which the greatest biogas output is being produced by such farm crops as wheat - 1374038,4 m^3. Biogas output in m^3 of the whole volume of vegetable residues of basic farm crops , being grown in region, makes up 2080595,5303 m^3 [2, c. 225-228; 3, c. 141].

Sludge does not possess smell, being peculiar to outlet fermentation mass. As the result of thermal treatment malignant bacteria and larvae of pests perish. The optimal term of fermentation may bring to disposal of the majority of bacteria makes up 30 days. Less time of fermentation can result in incomplete sterilization of substrate. After treatment in the biogas device it is allowed to take sludge out on the fields as fertilizer as it is then of no bacteriological danger any more. Percentage of sludge, being formed in the course pus use in biomethanegenesis processes, makes up 97%.

In conclusion it should be mentioned that production of biogas by means of methane fermentation of wastes is one of possible ways to solve power and ecological problems in countryside. Analysing statistical data for 2015 year on Kharkiv region the inference can be made, that it is expedient to introduce technologies of biomethanogenesis. The advantages of obtaining biogas are obvious, as the process of biomethanogenezsis meet the needs in energy, valuable organic fertilizer and contributes to environmental protection. Ecological safety in its use as well as biogas calorie content in combination with simplicity of technology for its getting receipt and enormous amount of recyclable wastes make up positive 406 factor for further development and dissemination of biogas industry.

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CASTING ALLOYS OF THE Al-Si SYSTEM

It is known that with increasing fineness of the structural components of the alloys the mechanical properties of the obtained products are increased. It is noted that a sufficiently large parts, components engineering products, produced by the foundry, due to inherent in this method advantages compared with other technologies for the manufacturing of parts, the most significant of which is the relative simplicity of the technology, however, allows to obtain a complex configuration details, which are almost impossible to produce by other methods, while ensuring the required technical documentation characteristics. These details, in particular, are cast parts, which are parts of the components, mechanisms and machinery transport machinery. However, in the industry widespread aluminum die casting alloys has received. In the manufacture of cast parts one of the main ways of improving quality is a modification, the essence of which consists in the introduction into the molten metal substances, which serve either as crystallization centers, or block the growth of emerging crystalline formations. To date, the "chopping" the possibilities of applying the means of modification, has reached its limit. And in recent years for this purpose there are more effective modifiers in the form of nanopowders of refractory high-strength chemical compounds (nitrides, carbides, oxides, borides, and others), the application of which leads to a significant enhancement of the mechanical properties of molded products. The paper presents examples of the application of nanopowders in the manufacture of aluminum alloys castings vehicles, as well as their use during welding, a process which is almost identical with the casting [12, p.63; 13].

Aluminium alloys with silicon as the major alloying element form a class of material providing the most significant part of all casting manufactured materials. Al-Si alloys are widely used in different fields of industry. Mechanical properties of casting alloys of the Al-Si system are presented in the Table 1.

Table 1

Mechanical properties of the Al-Si system casting alloys

Alloy	**Ultimate tensile strength (UTS), MPa**	**Specific strength (UTS/ ρ), m^2/s^2**	**Density (ρ),kg/m^3**
AlSi12	150–160	1,0–4,0	50,0
AlSi13	180	1,5	60,0
AlSi9Mg	160–250	0,5–1,5	60,0–90,0
AlSi10Mg	150–240	1,5–3,0	50,0–70,0
AlSi8MgBe	180–340	1,0–6,0	70,0–90,0
AlSi7Mg	140–300	1,0–5,0	45,0–70,0
A-S5U3G	120–210	0,5–2,0	65,0–75,0

These alloys have a wide range of applications in the automotive and aerospace industries due to an excellent combination of castability and mechanical properties, as well as good corrosion resistance and wear resistivity. Various additives are usually used to modify industrial alloys [11].

In the production of cast parts, particular importance is given to such a type of melt processing as modification [1; 6; 7], the essence of which is the introduction into the liquid metal of small quantities of substances that serve as centers of crystallization or block the growth of the emerging crystalline formations. In a number of cases, as a result, both processes take place in the following sequence: nucleation of crystallization centers → blockage of crystal growth. A significant amount of substances and methods of performing this process is used, but the essence of all of them is the introduction into the liquid metal of particles serving the first mechanism – either independent crystallization centers ("direct" heterogeneous nucleation) or forming them as a result of interaction with the melt, and the second mechanism – blocking the growth of crystalline formations arising in the solidifying melt. As a result of the modification, either macromolecular or structural components at the micro level are crushed (or a combination of both processes), including a change in the geometry of the intermetallic phase separations from the needle-shaped phase, causing stress concentration and crack development to become globular or close to it, which prevents the risk of cracks. The result of modification of metal compositions is the improvement of technological properties at the stage of production of cast products, as well as an increase in the strength and plastic characteristics of finished products.

The "grinding" possibilities of the modifying agents used, which are reduced to the introduction of modifiers in the form of ligatures into the liquid metal (an intermediate alloy consisting of a base component identical to the main component of the alloy to be modified + a modifying additive) have reached their limit.

And in recent years more effective modifiers have been used for this purpose in the form of nanopowders (NP) of refractory high-strength chemical compounds (nitrides, carbides, oxides, borides, etc.) [3; 5; 9]. Nanopowders are crystalline or amorphous formations with particle sizes not exceeding 100 nm (1 nm = 10-9 m), which have unique physic, chemical and mechanical properties that differ significantly from the properties of materials of the same chemical composition in the bulk state, and these properties can be transferred to a certain extent by products obtained from the number of atoms in their surface layer and in the volume is commensurable [2; 8].

As atoms on the surface of nanoparticles have neighbors only on one side, their equilibrium is violated and structural relaxation occurs, which leads to a displacement of the interatomic distance in a layer 2-3 nm in thickness.

Therefore, the surface layers of the nanoparticles are stretched and the inner layers are compressed, since the excess Laplace pressure [10] on them ($P = 2\gamma/r$, where γ is the surface tension, r is the radius of the nanoparticle) reaches hundreds of kilobars, which leads to substantial distortion of the crystalline lattice and, as a result, to the fact that this affects the activation energy of most processes in which they

participate, changing their usual course and sequence [8], which affects the characteristics of products manufactured with their use.

The application of nanopowders (NP) for the modification of the studied industrial alloys during casting into chill molds showed that all their types lead to an increase in mechanical properties. Thus, as a result of introducing into the liquid alloy AlSi12 after modification with a triple modifier:

a) NP vanadium carbide VC increases σ_v in comparison with the modification with the standard triple modifier (25% NaF + 62.5% NaCl + 12.5% KCl) to 228 MPa (in 3.2%), δ – up to 12.9% (in 4.4 times);

b) a mixture of NP 25% BN + 75% B_4C increases σ_v to 231 MPa (in 4.5%), δ – up to 13.5% (in 4.7 times).

Modification of the alloy AlSi9Mg with the NP of titanium carbonitride TiCN gives σ_v = 246 MPa, δ = 11.0%, and the NP of boron carbide B_4C – σ_v = 235 MPa, δ = 12.8% (according to GOST (State Standardization System) it is required $\sigma_v \geq 235$ MPa, $\delta \geq 3.0\%$).

The introduction of AlSi7Mg alloy after the triple modifier:

a) NP vanadium carbide VC gives σ_v = 234 MPa, δ = 14.5%;

b) the NP of boron carbide B_4C is 194 MPa and 9.8%;

c) a mixture of 25% NP VC and 75% B_4C – 280 MPa and 13.8% (according to GOST – $\sigma_v \geq 210$ MPa, $\delta \geq 2.0\%$).

On the alloy AlSi 11 when modifying with a triple modifier, σ_v = 227 MPa, δ = 2.9%, and the additional introduction NP of TiCN improves these characteristics accordingly to 284 MPa (in 2.5%) and to 4.1% (in 1.4 times) at the required GOST $\sigma_v \geq 210$ MPa and $\delta \geq 1{,}0\%$.

During the modifying of AlSi7Mg alloy with the triple modifier σ_v = 205 MPa, δ = 3,6%, and as a result of the additional injection, the NP of VCN σ_v increases to 217 MPa (in 5.6%), and δ – up to 6.8% (in 1.9 times), NP spenzircon (mixture of oxides ZrO_2, Nb_2O_5, TiO_2) – up to 246 MPa (in 19.3%) and up to 5.8% (in 1.6 times). When the modification of the AlSi7Mg alloy is carried by potassium fluorozirconate K_2ZrF_6, σ_v is 246 MPa, δ – 17.1%, and the additional introduction of:

a) Al-Ti and NP of TiCN increases these characteristics to 256 MPa (in 4.1%) and up to 25.3% (in 1.5 times);

b) NP of B_4C – up to 264 MPa (in 7.3%) and up to 22.5% (in 1.3 times). According to GOST it is required $\sigma_v \geq 160$ MPa and $\delta \geq 0{,}5\%$ [4].

Thus, the use of nanopowder technologies in the production of parts using metallurgical technologies is shown their high efficiency as a grinding agent for the structure of products, which provides an increase in the level of mechanical properties of cast and welded products from aluminum alloys.

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INNOVATIVE PROCESSES IN FOUNDRY PRODUCTION

The number of innovative processes increases every year in the foundry industry. This article deals with new methods for refining metal and production of porous metallic materials.

A new method for refining metal has been developed lately. The essence of this method is that the metal and salt are melted separately. The molten salt, the specific gravity of which is less than the specific weight of the metal in 1.5-10.5 times, is subjected to vibration and molten metal is poured into it. By the way, the less specific gravity of salt and metal, and the less the contact surface of salt and metal, the more intense the vibration of the molten salt is carried.

Such combination of new features with known ones makes it possible to reduce the laboriousness of the metal refining process, to obtain a more pure metal, to improve the quality of metal, to reduce energy costs and the cost of metal cleaning [3].

The method is carried out as follows. The salt, for example, the barium salt, is melted, and the metal, for example, aluminum or an aluminum alloy, is melted separately. Moreover, the molten salt should have a specific gravity less than the specific weight of the metal, which corresponds to the use of barium salt and aluminum. Molten salt is subjected to vibration and molten metal is poured into it. Molten salt, having a smaller specific weight than the metal, passes through the metal melt, cleaning the metal from nonmetallic inclusions. Vibration of molten salt increases the efficiency of metal cleaning from non-metallic inclusions. After passing through the metal, the salt melt accumulates on the surface of the metal, the melt vibration is stopped, the salt is drained from the metal, and the purified liquid metal is used for casting. This process can be repeated, which leads to a complete purification of the metal from nonmetallic inclusions. After that, the salt is cooled, dissolved in water and the nonmetallic materials transferred from the metal are removed from the solution, the water is evaporated, the purified salt is dried, and then it is melted and reused for the above process. The amount, shape and composition of nonmetallic inclusions removed from the metal are determined from the non-metallic materials extracted from the solution.

The choice of the vibration intensity of the molten salt depends on the difference in the specific gravities of the salt melt and the metal to be cleaned, as well as on the contact surface of the molten salt with the molten metal, the required degree of metal purification from nonmetallic inclusions. The smaller difference in the specific gravities of salt and metal, and the less contact surface of salt and metal are, the more pure metal is required, the greater vibration intensity of the molten salt is needed. The specific gravity of the salt melt should be in 1.5-10.5 times less than the molten metal poured into the molten salt.

In practice this method is carried out as follows. The water-soluble barium salt is melted in a crucible furnace and aluminum is melted separately in another crucible furnace. The volume of the molten material is the same; the capacity of the crucibles is greater than the double volume of salt and metal. The temperature of the molten materials is raised to 800 ° C., then a vibrator attached to the crucible with the molten salt is added and the molten aluminum poured into the molten salt. After passage of the salt through the metal and the accumulation of molten salt on the surface of the metal, the vibrator is turned off and the molten salt is poured along with the molten metal into the crucible in which the aluminum is melted. Then, the molten salt is drained from the molten metal, and the metal is used to fill the castings. After cooling, the salt is dissolved in water, nonmetallic materials are removed from the solution, analyzed them, the water is evaporated, the salt obtained from the solution is dried, melted again, and used for the purification of aluminum from nonmetallic inclusions [4].

With the help of this method, the amount of nonmetallic inclusions in the metal is in 2-3 times less, the duration of the metal refining process is in 3.5-5 times less, the electric power consumption for the process is in 1.5-2.6 times less, the tensile strength of the purified metal is in 1.2-1.5 times higher than when the metal is refined with the help of other methods.

The proposed method can be used not only for refining aluminum alloys, but also alloys containing copper, iron, tin, lead, nickel, chromium, silver, gold, platinum and other components [2].

A new method for the production of porous metallic materials and products has been developed lately. The technical result of the proposed method is simplification, reduction of labor input, obtaining porous castings with heat-insulating properties, due to the use of inexpensive, non-deficient gas-producing substances.

The technical result in a method for producing a porous casting comprising material melting, adding to the form of a gassing substance, and casting a melt into a mold, an organic substance is achieved by using a gassing agent, which is added to the mold prior to the formation of the melt crust, which is poured into the mold with overheating in 50-150 degrees. In this case, according to the invention, black soil, humus, peat, silt, rosin, crushed paper, wood, plant residues, powdered hydrocarbons, carbonates is used as a gassing organic substance.

Porous castings, containing voids in the form of gas shells and channels of various shapes, can be obtained from various metallic and nonmetallic materials (cast iron, steel, copper, aluminum alloys, silica, high-alumina, glass compounds, and plastics). The shape, dimensions, weight of hollow castings can be as required. The quantity and composition of the gassing substances added to the mold are determined on the basis of the requirements of the degree of emptying of the material to be filled into the mold, the composition of the molten material, the temperature and viscosity of it when it enters the mold, the cooling rate of the cast material in the mold [5].

Application of inexpensive, non-deficient gas-producing substances such as: black soil, humus, peat, silt, rosin, crushed paper, wood, plant residues, powdered hydrocarbons, carbonates makes the proposed method economical and allows using waste or low-value materials for the process [1]. The choice of the temperature of the

molten material, at which the melt enters the mold, is made taking into account the fact that the amount of heat of the melt entering the mold should be sufficient to decompose the gassing substances and form the necessary quantity of gases. Before the formation of the crust of the material that solidifies in the form of a material, the temperature of the melt entering the mold should be 50-150 degrees higher than for the conditions for obtaining a dense cast of the same material. Under the influence of the heat of the melt entering the mold, the decomposing gassing substances form gases and vapors that pass through the solidifying material and form pores and voids in the casting. The amount of evolved gases must be such that not all gases leave the casting, and some remain in the form of bubbles in the casting and form numerous gas shells and voids of the required dimensions and in the right places in the solidified material. Depending on the thickness of the walls of the casting, the mass, temperature, viscosity of the melt, the amount of heat required for the decomposition of the gas-melt material, the composition of the gassing substance, the quantity and its placement in the mold is selected. The gaseous substances can be added to the molding mixture, making it a lining of the mold, which is destroyed when the casting or a permanent mold (metal, refractory) is knocked out.

The porous castings, having a large number of voids, acquire heat-insulating properties and have high strength (at a lower mass, less specific weight compared to the same dense castings). These cast products can be used instead of dense, heavy, expensive refractory molds in heat exchangers, recuperators, regenerators. They can protect from the cold the buildings and structures, so it is possible to use them to make the walls of industrial facilities, the details of energy devices [4].

This method is applicable for the production of porous castings of steel, copper, aluminum, lead alloys, molten cupola slag, glass, and plastic. The composition and amount of gassing substances can be varied within wide limits depending on the technical requirements for the porosity of the castings.

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APPLICATION OF DIGITAL PROGRAM 3DM ANALYST MINE MAPPING SUITE IN ACCURATE MINE MODELLING

The development of automated methods of planning and organization of mining operation is connected with the creation of mathematical models of quarry. In our time modern methods of 3-D quarry surface modelling with accurate representation of bank contours and other elements of mining are widely introduced. With rapid development of technology, these methods improve and become simpler to implement.

Construction of three-dimensional models of quarry and individual objects has always been a topical issue. Modern computer and digital equipment gives us the ability to perform this kind of task, making no field measurements. It takes only ten minutes to build a three-dimensional image with new digital system 3DM Analyst Mine Mapping Suite.

The software performs the following tasks:

- geological and geotechnical analysis;
- resources modelling;
- calculation of the volume of stocks;
- measurement of the wear of the teeth of technical transport.

The advantages of this program:

-the ability to capture large areas of a quarry by photographing them;

-the ability to obtain data from up to 3 km away or from the air when there is no safe access to the area being mapped;

-the speed at which the data can be generated if to compare with other techniques;

-the level of accuracy and specification of the data generated if to compare with other techniques;

-the fact that acquiring the data does not interfere with mining activities;

-the ability to acquire data in different climactic conditions.

Using modern digital camera with a large focal length gives us the opportunity to make a detailed model (Digital Terrain Model) and three-dimensional image of the object. Given the distance between two any camera positions our software is able to generate correctly-scaled data even without any control points or surveyed camera positions; with at least three known locations — control points and/or camera positions — the data can also be registered in a real-world system, even when it is impossible to place control points in or near the area of interest.

3DM Analyst Mine Mapping Suite has established itself as a valuable program in the field of data mining. It is of particular interest to block and crushed stone quarries, because its specifications allow performing the work with required

accuracy. Due to 3DM Analyst Mine Mapping Suite, the works on paper panel run faster and, thereby the productivity increases.

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INSTRUMENTAL AND TECHNOLOGICAL PROVIDING OF FINISH TREATMENT OF DETAILS OF HARD-PROCESSING MATERIALS WITH HEATING OF THE PROCESSED SURFACES

On treatment, a cutting process intensifies with heating. However, at this method treatment through the necessity of heating of purveyance becomes complicated. It is therefore expedient to apply it at cutting of hard-processing materials, for example, of magnetic, chromic alloys and others like that. On treatment of such materials, there are considerable forces of cutting and vibration, which results in the intensive wear of cutting instrument and low quality of the treated surface. In this case, as a result, of the understated modes of cutting and small firmness of instrument the productivity of treatment is very low.

On treatment of hardness descriptions (border of durability, hardness) of the processed material decrease with heating, and that is why tension of process of chip formation and specific loading diminishes on an instrument, and quality of the treated surface rises. By the change of temperature of heating, it is possible to influence on the degree of flowage, friction, wear of instrument, and on other parameters of cutting. However, properties of instrumental material change at heating. Therefore, efficiency of this method of treatment depends on the degree of durability of the processed material as compared to instrumental [1].

Heating of purveyances is conducted in a number of different ways: in heat-treatment furnace or electric stoves, by the currents of high-purity, voltaic arc, induction currents, infrared rays and method of friction [3].

To attain the noted optimum temperature of cutting is possible without heating due to the increase of parameters of the cutting mode. Although, in this case without regard to the temperature of cutting, firmness of instrument will be low. It is explained by the fact that at heating all purveyance is heated, and without heating - only his skims. Therefore, while heating an effect from the decline of durability of the processed material will be higher than without heating.

The investigation offers to use the industrial heat gun. Heat gun apply on a production and in different repair shops. The basic differences of such heat guns are high temperature and speed of heating.

Depending on the type of works and sphere of the use it is possible to classify according to the following categories: heating of material, agglutination of two details, grant the solid of true-to-shape, drying of superficial layer, delete of material under the temperature and so on.

Construction of industrial heat guns is largely homogeneous; a heat element is connected to a ceramic insulator placed in a plastic frame, which withstands high temperatures.

An electric motor executes the function of air handling on a heat element. The power of electric motor directly influences the temperature of stream, which is 600 – 800 °C. Power of industrial heat gun is determined totally from power of spiral (heat element) and ventilator and can be 500 – 2500 W.

An important index of an industrial heat gun is an element of adjusting of air temperature, which is heated, and adjusting of volume of air that is forced. The presence of the electronic support system of the set temperature is provided by control of overheat of detail and diminishes the level of damage of heat gun. Moreover, in this case the presence of display system is necessary, that provides control of parameters of air blast which processes a detail.

An area of heating on treatment surface must be not less than working parts of tools and the process of heating takes place in to perpendicular direction of two heat guns fastened on the special device. In the course of investigation a basic task is providing of increase of parameters of roughness of surface, diminishing of strength of material, and increasing of efficiency of treatment of material, only in the limited area of treatment [2].

A flat detail is exposed to heating of the necessary temperature. Heat guns are directed in front of an instrument on distance not less than working area of an instrument and in perpendicular direction. This setting provides warming up of detail to the level of favorable terms where a temperature is 450-550 °C. Due to this chart the simultaneous and even warming up of material in the entire area on the depth of the processed surface and absent large temperature drops. The component frame does not suffer from the considerable changes of strength descriptions and the necessary quality of surface is provided.

Thus, the offered chart provides the increase of efficiency of treatment of flat surfaces of hard-processing materials with the simultaneous improvement of quality of the processed surface.

Further research is foreseen with the use of different type of steel.

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ECOLOGICAL STATE OF BIODIVERSITY IN OLD-BERDIANSK FORESTRY

The conditions for biodiversity of Old-Berdiansk forestry conservation, researching it as well as its ecological state are given in the article. The typology of forest plantations is considered.

Keywords: biodiversity, forestry, typology, ecological condition.

The reasons causing ecological problems are nature conservation and the environment protection. That is why its principal method is forming and development of natural forest reserves and protected areas such as forestry. To determine the current status and further development of the biodiversity of our country, region, district it needs to analyze and control each natural object.

Old-Berdiansk forestry researching started in 1950 by scientific expedition led by AL Bellegarde. The expedition studied forests, subordinated to Melitopol forestry enterprise, to which Old-Berdiansk forestry belongs. The research focused on the study of soil, flora and fauna, the climatic characteristics of the territory and served as the basis for substantiating forestry-growing conditions for artificial forests in steppe zone of Ukraine. That is, soil scientific, hydro-climatic, biological and silvicultural researches were being conducted. They fully examined forest reserve and later such studies had never been conducted.

When researching the properties of forest areas generally adopted ecological, bio-geo-coenosis and geo-botanical methods as well as statistical, mathematical and evaluation methods were used. Evaluation of recreational potential of Northwest Azov plantations was conducted on the database of draft project organization and development of "Melitopol forestry" enterprise. Old-Berdiansk forestry" of Zaporizhia Regional Forestry and Hunting [6], evaluation description, field studies of certain sections of the area were being researched according to modified methodology using software.

The *purpose* of the article is to research ecological biodiversity state in Old-Berdiansk forestry as a silvicultural landscape in the steppe.

Old-Berdiansk forestry is a man-made forest,that is why it is considered the silvicultural anthropogenic landscape.

Massive Old-Berdiansk forest is the green oasis in arid Pryazovska Steppe. Being anthropogenic by origin it has not become isolated from the environment and from its very planting it started close interchanging of matter and energy with the adjacent natural systems. Along its border natural coexistence of forest, steppe and water objects is being realized [1].

Modern landscape topological structure of Old-Berdiansk forestry was described on the basis of valuation description analyzing plantations of trees within the boundaries of quarters as of 01.01.2009 [6] and its field research. Landscape and topological features of Old –Berdiansk forest massif are preconditioned by its spatial location on the left bank of the Molochnaia river valley at the very confluence of the river Arabka. Landscape structure of the territory is being complicated by river-valley landscapes (floodplain; first, second, third, fourth, fifth and sixth above the floodplain terraces, stagnant lakes, wetlands, coastal landscapes) as well as minor relief changes in topographic surfaces (gully, hollows, hills and erosional forms).

Old-Berdiansk forestry is the part of regional recreational silvicultural systems of Northwest Azov, being the reserve for the recreational activities development in the steppe zone of Ukraine. Forest bio-geo-coenosis possessing their ecological properties form the basis for further formation and development of forestry biodiversity. Determining of the ecological state in forest areas is essential for optimizing as well as efficient use of the territory and biodiversity development.

Based on the existing forests division into groups and protection categories, their functional value as well as practice, having already been set, in forestry holding and use for the next auditing period, the following business entities have been formed:

- forests of environmental protection purpose with restricted mode of use on the plain;
- recreation and health forests with special mode of use on the plain;
- protecting forests with special mode of use on the plain.

The main tree species in Old-Berdiansk forestry are: ordinary honey locust *(Gleditsia triacantho s),* oak *(Quercus robur) and* white acacia *(Robinia pseudoacacia).* In addition, there are some cultures of pine *(Pinus sylvestris)* and Crimean *(Pinus nigra pallasiana),* field maple *(Acer campestre)* in small numbers and maple *(Acer platanoides),* birch *(Betula)* as well as some other species: Juniperus virginiana *(Juniperus virginiana),* the average spirea *(Spiraea media).* Hornbeam elm *(Ulmus minor arpinifolia)* grows in impurity, Virginia bird cherry *(Prunus virginiana),* Japanese Sophora *(Styphnolobium japonicum),* maclura orange *(Maclura* pomifera), Indian Rose *(Rschsa chinensis),* Phellodendron amurense *(Phellodendron amurense),* Forsythia *(Forsythia),* Ailant *(Ailanthus)* and 14 species of willow *(Salix* L.). From the bushes there grow yellow acacia *(Caragana arborescens),* smoke tree *(Cotinus),* Tartar maple *(Acer tataricum),* on lawns - blackthorn *(Prunus spinosa).*

According to the typology of Pogrebniak P.S. within Old-Berdiansk forestry produce 11 forest types are being distinguished, among which fresh eroded grove

(53.5%) dominates and dry eroded black maple grove; much less area is under dry maple-oak-lime grove (up to 10.8%) [4].

Sanitary state of forests in forestry now is considered to be satisfactory, being confirmed by the amount of dry-resistant and damaged wood. In the course of last revision period, the outbreaks of mass reproduction of pests were not observed [6].

Such animals as moose *(Alces* alces), roe *(Capreolus* Gray) squirrel *(Sciurus),*marten *(Martes),*badgers *(Meles),* wild boars *(Sus* scrofa), hares *(Lepus),* foxes *(Vulpes vulpes)* live here. Among birds – long-eared owls (Asio otus), waxwings *(Bombicilla),* bullfinches *(Pyrrhula pyrrhula),* yellow head beads *(Regulus* regulus) - the smallest bird in our country. But nowadays many varieties of birds are no longer there, red-footed falcon *(Falco vespertinus),* falcon - balaban *(Falco cherrug),* common buzzard *(Buteo buteo),* steppe eagle (Aquila nipalensis), pallid harrier (Circus macrourus). This is the result of environmental crisis.

Hunting is banned in the Old-Berdiansk Forestry, so we can safely say that the situation is satisfactory as well as fauna state. Prohibition of hunting gave the ground for animals to freely multiply, grow and enrich forestry biodiversity. In recent years, there were not found any cases of leptospirosis among animals [6].

Since 1919 scabies (carkoptoz, demodicosis), having been imported from Europe, gained widespread in Ukraine [5]. In the Old-Berdiansk forestry foxes *(Vulpes* vulpes) often fall ill. In spite of the fact that not a single case of infecting by tularemia or Siberian ulcer among hunting animals or livestock was detected, such a risk still exists. More often muskrat *(Ondatra zibethicus)* and brown hare *(Lepus europaeus)* suffer from tularemia. Siberian ulcer frequently affects boar *(Sus scrofa),* roe *(Capreolus capreolus)* and other ungulate animals. The cause for this is in availability of certain number of cells of the above mentioned diseases on the territory of Zaporizhia and adjacent regions.

In conclusion it should be mentioned that the area of forest and floodplain is represented by flood-type terraced terrain including six channels of terraces of the rivers Molochnaia and Arabka. Within the floodplain and floodplain terraces and in connection with sufficient soil moisturizing and environmental insensitivity to saline soils hardwood plantations are predominant. Within the second terrace at above the floodplain the share of coniferous plants increases, within the high terraces deciduous drought-resistant plantations and coniferous pine plantations, juniper and arborvitae plantations are predominant. At the beginning of 21st century almost all forest plants don’t correspond to their place of habitat and need complex researching and improvement.

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A TRANSFORMING VEHICLE

The aim of the project is to create a vehicle that will be used as a car and a motorcycle. At this stage of development studies include knowledge of such sciences as mechanics, aerodynamics, hydraulics and materials technology.

Exploitation of the vehicle will take place on the road, highway and off-road or in narrow alleys where conventional car does not fit because of their size and the bike passes easily. It is important that the vehicle which a person buys a person could be used anywhere.

In this case we consider a hybrid combining basic properties of motor vehicles and motorcycles owing to changes in body shape and size and its ability to switch between the two modes: car and motorcycle respectively.

In general the design consists of several modules responsible for changing certain characteristics or together with others and form new characteristics.

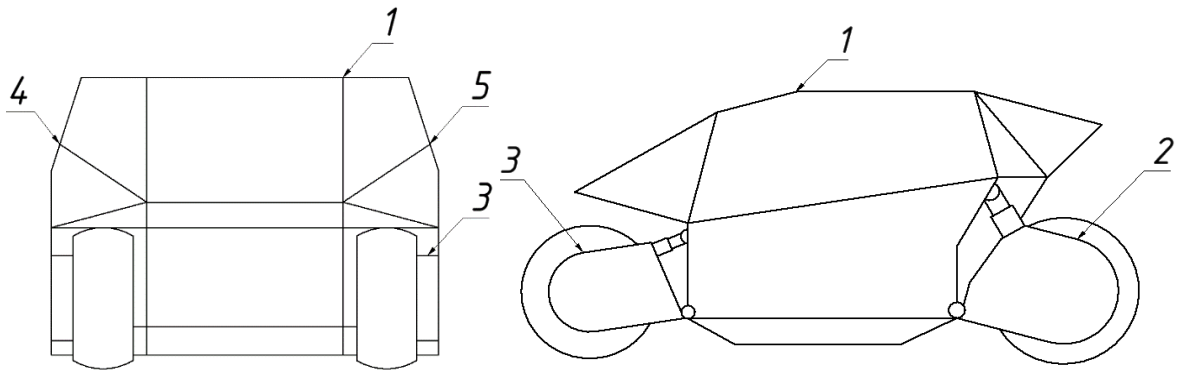

Fig.1. The scheme of an automobile.

The main of the modules is the housing (1) which will change the width of the road or in case of presence only a driver according to the speed. Thus, the smaller the area of surface resisting the wind the better the aerodynamic properties of the car and it can accelerate faster. The bottom of the convex shape is the strongest part of the body because it is a bearing element. It consists of three parts: two main parts(4) and (5) and another binder which is part of the expansion of the housing. Connecting link using hydraulic system hides equally in the other two parts.

To ensure the rigidity it is necessary to provide small gaps between the walls, on which links slide relatively to each other and provide secure fixation in both positions. Housing along the perimeter is composed as "accordion", and flexible glass is engaged in the sideways of the housing. The transition between configurations can take place on the move and in astandby mode as well. On the move it is possible only on a straight road through the wheels turning inside the housing at an angle in the range of 1-5 degrees depending on the speed. In this case the load on the hydraulic system is minimum. In the standby mode sliding levers beneath the housing are used raising the vehicle above the ground to avoid tyre axial friction against the road surface. The hydraulic system is the main force acting in this case.

The driving elements of the hybrid are modules of suspendering rear (2) and front (3) parts. The car will move, turn, withstand cornering load and modify clearance with their help. Front module is responsible for turning the front wheels and the change of clearance. The rear modules are responsible for the movement of the vehicle, clearance and have the ability to turn in a small sector to change the width of the car on the move. Two electric motors are installed being a driving force of the hybrid. To counteract the cornering centrifugal force pneumatic suspension will be tilting car sideways shifting the mass center closer to the turning of the external sector. The value of the tilt will be different between phase of the car and the motorcycle.

This study combines the best properties of the car and the motorcycle as well. It enhances human movement even without leaving the car.

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RECREATIONAL COMPLEX OF ZHYTOMYR AREA

Formation of state strategy for development of recreational facilities in Ukraine and recreational nature use is an urgent problem because of the need of mass recreation of the country's population. This strategy is the basis for constructive interaction between the governmental bodies of Ukraine and their subjects to ensure the integrated use of naturally-recreational resources and potential of economic activities (Table.).

Recreational objects of Ukraine and Polissia

	Ukraine		Polissia	
Recreational objects	Quantity	%	Quantity	%
Sanatoriums, resorts, boarding houses with treatment	4337	55,3	35	17,9
Children sanatoriums	202	2,5	15	7,7
Sanatorium-dispensaries	568	7,3	4	2
Holiday houses and boarding houses	342	4,3	4	2
Recreation centers	2236	28,5	134	68,9
Camping sites	165	2,1	3	1,5
Total	7850	100	195	100

Zhytomyr area – is a region with unique and unrepeatable beauty of nature and an abundance of recreational facilities. The ratio of reserved areas is 2 - 4%. This area is one among the regions of Ukraine with the largest number of park-memorials of landscape art. Nature reserve fund of Zhytomyr region includes: 1 natural reserve, 10 wildlife preserves of national importance, 76 public local wildlife preserves, 2 natural memorials, 18 state natural memorials, 1 botanical garden and 31 park-memorials of landscape art.

Polissia natural reserve is the largest reserve in Ukraine with the territory of 20104 hectares. It occupies the area within Olevskyi and Ovruch districts. All wildlife preserves of national importance are situated in Zhytomyr region in the territory affected after Chernobyl accident. First of all, state wildlife preserves are established in the territory with huge variety of plant and animal species which are listed in the Red Book of Ukraine. Among them are such state forest preserves as "Tuhanivskyi" (186 hectares) in Novograd Volynskyi district, state forest preserve "Poiaskivskyi" (113 ha) in Olevsk district, botanical wildlife preserve "Gorodnytskyi" (305 ha) in Novograd -Volynskyi district, landscape wildlife preserve "Plotnytsia"

(464 ha) in Olevsk district, general state zoological wildlife preserve "Kaziava" (1633 ha) in Novograd Volynskyi district, geological preserve “Stone Village” (15 ha) of Zamyslovetske forestry in Bilokorovychy state forestry, landscape wildlife preserve "Poligon" (2293.3 hectares) in Korosten district.

In order to preserve, study and enrich the diversity of plants for their most effective cultural and scientific use, Zhytomyr Botanical Garden was established in Zhytomyr region in 1933.

Slovechansko-Ovruch ridge is one of the most beautiful landscape recreational resources in Zhytomyr Polissia. Its absolute height above sea level is about 300 - 320 m., with the territory of 750 km2. You can see beautiful rocks with crystalline minerals there, as well as 80 m deep canyons with small rivers, and dense forest on the top of the rocks. Denyshi village, which is called "Polissia Switzerland", is widely known not only as a resort with treatment facilities, but among climbers and tourists.

We should focus on recreational opportunities of the forest area, as far as the area of forests in Zhytomyr region is more than 1 mln hectares.

In order to improve the development of recreational complex, we should:

 conduct full environmentally-economic assessment and certification of recreational resources;

 make transition from partial and separate researches of specific problems of recreational infrastructure development and recreational use of nature resources on a departmental basis to complex researches and working out relevant programs on a region scale;

 comply with the uniformed state standard techniques in the field of treatment and rehabilitation methodology;

 ensure a full funding of scientific researches.

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USING SOLAR POWER: POSSIBILITIES FOR UKRAINE

The main ways of using solar energy are considered. This study reveals the potential of solar power development in Ukraine. Advantages of solar power as an alternative source of energy are emphasized.

Solar power is energy coming from the sun. It is vitally important because without it life on Earth would end. Moreover, this kind of energy is free and available in the vast amounts. In fact, the number of its applications has increased significantly in recent years.

Ukraine’s geographical location and a lot of sun especially in the south makes it necessary to study the ways of using sun energy in the world. Experience of foreign

countries can be useful for Ukrainians. Rapid increase in cost of electricity in our country motivates us to use alternative sources of energy more. All these factors reveal the relevance of our research.

The objective of the research is to demonstrate some ways of using solar energy efficiently and reveal the potential of using it in Ukraine.

The Internet resources such as sites of international companies (Evergreeen Solar, Activ Solar, NREL, Martifer Solar, Ashden, Rengy Development, Solar park, Solar energy plus and others) have been used.

The most widely spread in different countries are the rooftop or building integrated solar cells and solar panels. Solar cells, also called photovoltaic (PV), are devices that convert sunlight energy directly into electrical energy. Their work is based on the principle that photons (particles of light) knock electrons free from atoms and this generates the flow of electricity [1]. Nowadays there are cells of three generations with semiconductors made from different materials (silicon alloys, cadmium telluride, conductive plastic etc.). Many solar cells linked together make up a solar panel. There are large utility-scale power stations based on PV systems that produce hundreds of megawatts. Solar panels produce power that is consumed by the company or family and excess power is sold by connecting to the utility grid.

There is also a variety of solar thermal power plants: a parabolic trough, a solar power tower system, solar dish system etc. Solar thermal power generation systems collect and concentrate sunlight to produce the high temperature heat needed to generate electricity. All solar thermal power systems have solar energy collectors with two main components: reflector and receiver. Reflectors (mirrors) capture and focus sunlight onto a receiver. In most types of systems, a heat-transfer fluid is heated and circulated in the receiver and used to produce steam. The steam is converted into mechanical energy in a turbine, which powers a generator to produce electricity [4].

A parabolic trough is a type of solar thermal collector that is straight in one dimension and curved as a parabola in the other two, lined with a polished metal mirror. There is often a tube, which contains a fluid which is heated to a high temperature by the energy of the sunlight. The hot fluid can be used for many purposes. Often, it is piped to a heat engine, which uses the heat energy to drive machinery or to generate electricity [2].

A solar power tower system uses a large field of flat, sun-tracking mirrors called heliostats to reflect and concentrate sunlight onto a receiver on the top of a tower. Sunlight can be concentrated as much as 1,500 times. Some power towers use water as the heat-transfer fluid [4].

Solar dish systems use a mirrored dish similar to a very large satellite dish. The mirrored dish is usually composed of many smaller flat mirrors formed into a dish shape. The dish-shaped surface directs and concentrates sunlight onto a thermal receiver, which absorbs and collects the heat and transfers it to an engine generator [4].

Today researchers from different countries are successfully working on projects for producing solar fuel, a synthetic chemical fuel produced directly or indirectly from solar energy through photochemical, thermochemical or electrochemical reaction. Sunlight is used as an energy source and can catalyze chemical reactions that use water and CO2 to produce liquid or gaseous fuels (for example, hydrogen, methane, various alcohols and hydrocarbons).

Speaking about Ukraine, experts state that it has favourable geographical location for using solar energy technologies. According to research data the amount of solar energy reaching the earth's surface per 1 sq. square meter in Ukraine is higher than in Germany, which is a leader in efficient use of sun energy. There is a number of companies introducing sun technologies in Ukraine: Activ Solar (Odeska obl. and the Crimea), Martifer Solar, Rengy Development (Trostianets and Sharhorod), Energoinvest (Vinnytska obl.), Novosvit, Vinsolar, Eurosolar, Solar park, Solar energy plus and others.

The main advantages of using solar energy in Ukraine are: providing clean power for homes, communities and businesses, reducing the need for fossil fuel generation, cutting global carbon emissions and greenhouse gases, enabling businesses and families to save money, creating new jobs, economic development.

As a conclusion, all the ways of using solar energy described in the article are to be used in Ukraine. This will promote economic growth of the country and will help to care about the environment more efficiently.

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COMPARATIVE CHARACTERISTICS OF 137CS ACCUMULATION BY PLANT SPECIES OF HEATHER AND ROSE FAMILIES

As a result of the Chernobyl accident in 1986 the total radioactivity of the substances fallen out of the reactor into the environment is about 300 MCi. The most contaminated areas of Ukraine are Kiev and Zhytomyr regions. By 1996 forest soils with 137Cs contamination density of more than 37 kBq / m2 (1.0 Ci / km2) occupied more than 439,879 hectares in Zhytomyr region. 30 years after the Chernobyl accident radiation situation slightly changed, mainly due to the physical decay of radionuclides. But radiological problems in the region remain relevant.

As a result of the accident, strong penetration of radionuclides into various parts of forest ecosystem food chains occurred. Such species of rose and heather families as cowberry, blueberry, blackberry and raspberry occupy a special place in trophic chain among producers. These plants form living above-soil cover and undergrowth of forest ecosystems; besides, these forest berries are consumed by man.

Blueberry (Vacciniummyrtillus L.) is a deciduous bush up to 0.5 meters high. Cowberry (V.vitis-idaea L.) is a stunted evergreen bush. These species are the representatives of heather family (Ericaceae). They are growing under the canopy of forest trees forming a living above-soil cover. Blackberry (Rubusnessensis) and raspberry (R.idáeus) are bushes of about 3 m high. These plants are the representatives of rose family (Rosaceae) which grow in forests, clearings and riverbanks, thus they form undergrowth. Contamination of plants depends primarily on 137Cs radiation contamination density of soil. Comparison analysis in the same research area in 1996 and in 2016 shows the decrease of this index by 2 times approximately. In 1996 the average value of 137Cs radiation contamination density of soil was about 221 ± 57 kBq / m2, and in 2016 - 116 ± 35 kBq / m2. 137Cs specific activity in cranberry shoots was 2739 ± 290 Bq / kg, blueberry shoots - 1310 ± 269 Bq / kg, blackberry shoots - 179 ± 16 Bq / kg and raspberry shoots - 9Bq / ± 23 Bq / kg. The accumulation coefficients equaled to 23.61, 11.29, 1.54, 0.19 ((Bq / kg) / (kBq / m2)) respectively. The decrease of 137Cs penetration from soil into phytomass was also observed when to compare with the results of 1996. The difference in values of accumulation coefficient for cranberry was by 4 times; for blueberry and blackberry the difference was by 11 times; and for raspberry it was by 300 times. Such considerable differences can not be explained only by physical decay of radionuclides. The main reason, in our opinion, is the vertical migration of isotopes through soil profile, which occurred as a result of changes of radioactive contamination of sucking roots zone of different plants species.

Therefore, based on current research data, we can conclude that the changes in the radiation situation occurred 30 years after the Chernobyl accident due to natural decay of 137Cs radionuclides (T1 / 2 = 30 years) and vertical migration of radionuclides in soil.

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LAGER DER VERKLEIDUNGSSTEINEN GABBRO IN ZHYTOMYRER GEBIET UND DIE ZWECKMÄSSIGE NUTZUNG

Zhytomyrer Gebiet ist in der Ukraine reich an den Vorräten von natürlichen Verkleidungssteinen, ist der Führer nicht nur in der Ukraine, sondern auch in Europa. Die Gesamtvorräte von natürlichen Verkleidungssteinen werden von fast 440 Millionen M^3 geschätzt. Der Vorräteanteil aller Lager der Ukraine sind: Dolomit – 83,3%, Granodiorit – 100%, Granit – 14,3%, Gabbro – 84,1%, Labradorite – 93,3%. In Zhytomyrer Gebiet haben die Benutzer das Recht 90 Lager von natürlichen Verkleidungssteinen mit einer breiten Palette von Farben und dekorativen Eigenschaften zu ausbeuten, mit den Gesamtvorräten von mehr als 140 Millionen. M^3. Heutzutage sind mehr als 70 Lager, wie in Volodarsk-Volynsker, Korostyschiwer, Chernyakhivsker, Maliner, Korostener, Zhytomyrer konzentriert sind. Im Gebiet wurden es in 2015 4466,4 tausend M^3 der Blöcke von natürlichen Verkleidungssteinen produziert. Das beträgt 143,9 % des 2014 Jahres und 66,7% die Herstellung dieser Produkte in der Ukraine.

Gabbro ist der zweite dekorative Stein nach Granit nach dem Umfangen der Gewinnung in der Ukraine. Dankbar der hohen Qualität und der dekorative Eigenschaften dieses Materials nimmt er in den letzten Jahren Interesse zu. Die Vorräte Gabbro, Granit und Labradorit betragen 147 730 tausend M^3 in Zhytomyrer und 28 931,5 tausend M^3 Zakarpatener Gebiet. Vorkommen von Gabbro befinden sich fast in der Hälfte der Regionen des Landes: in Zhytomyr, Riwne, Kirowograd, Nikolaev, Dnipropetrowsk, Tscherkasse, Donezk, Zaporizhya, Vinnytsa und Kiew. Die Vorräte Gabbro offen auf dem Territorium der Ukraine 43 931 tausend M^3, davon entwickelt etwa 30 804 tausend M^3. Lager in der Ukraine – Golovinsk, Korostyschivsk, Bystryyivsk, Bukiwsk, Bukynsk, Dobrynsk, Sliptschynsk, Tortschynsk, Yampolsk, Kamyanobridsk, Yulkiyivsk, Kysorytsk, Lugove, Schadursk, Yakymivsk, Irschytsk, Adamivsk, Gatskivsk, Deribasivsk, Olexandrivsk, North Slobitsk, Rudnya-Schlyachova, Pysarivsk, Volodymyrsk, Gubenkivsk, Ivanivsk, Isakivsk, Blau Stein, Teofipolsk, Scherschnivsk.

Die rationale Nutzung des Inneres ein System der wissenschaftlichen Forderungen, die eine produktionstechnische und organisational Charakter, haben deren Ausführung gewährleistet eine vollständige und komplexe Nutzung von Ressourcen des Inneres für die Versorgung der geistlichen und materiellen Bedürfnisse der Gesellschaft. Die rationale Nutzung des Inneres fordert das vollständige erwerben der Bodenschätze in ihrer geologischen Konturen, dass versorgt die Senkung der Verluste der Mineralien mit enthaltenen bedeckenden und

unterlegenen leereren Gestein mit der Anwendung der progressive Technologien und ihrer ständige Vervollkommnung bei dem Ausnahme von anderen Mineralien. Die Anwendung von modernen Technologien und Techniken versorgt die maximale Rückgewinnung von Konditionsrohstoffen. Bei dem Herausbekommen der Felsengestein wird die Technologie des Sprengens angewendet die die Zerkleinern des Gebirgsmassivs und die Verringerung des Schotters nicht zulässt.

Bei der Ausarbeitung des Lagers, wird das Herausnehmen von oben nach unten geführt und damit die minimalen Verluste der Mineralien gewährleistet; der Gestein, der in der Zukunft angewendet wird, wird in den speziellen Deponien zusammengelegt; die Teilen der verschiedenen Größen ziehen an der Ausarbeitung heran und nach der Mischung mit hochwertigen Rohstoffen bekommt man das Handelsprodukt.

Die komplexe Ausarbeitung der Lager wird eingeführt, falls mehrere Mineralien gleichzeitig erwerben werden und wird keine Abfalltechnologie versorgt. Die rationale Nutzung des Lagers, geförderter mineralischen Rohstoffe und Abfälle der Bergbauherstellung hilft der Vergrößerung der Effektivität und wird ein wichtiger Faktor des Umweltschutzes.

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Session work №2

MODERN RESEARCH IN THE FIELD OF INFORMATION COMPUTER TECHNOLOGIES

UDC 612.914

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HOW TO CREATE ARTIFICIAL INTELLIGENCE

The aim of this study was to instruct for creating artificial intelligence, including those who are not familiar with programming. The purpose of this study was defined during the conversation with a friend about his dreams. It was the desire to create the perfect artificial intelligence, whether it's mobile or model program has advanced on the path of the programmer a lot of people. Robots with AI will perform more complex actions: such as daily work, military affairs, entertainment features and others. The problem is that in tons of educational material and the harsh reality of customers, it is the desire has been replaced by a simple desire for self-development. The required material was investigated and based on it has been created a short step by step guide.

Based on this, the person can create from a simple game bot to AI of future standard.

-Chapter 1. Mathematics above all!

When we talk about the creation of at least a simple bot, our eyes are filled with glitter, and in our minds flit hundreds of ideas, that he should be able to do. However, when it comes to implementation, it appears that the key to unlocking the real pattern of behavior is mathematics. Yes, the AI is much more difficult to write applications - some knowledge of design software you do not have enough.

Mathematics - this the scientific springboard on which to build your future programming. Without knowledge and understanding of this theory all the ideas quickly be broken on the interaction with a person because the artificial intelligence

is actually no more than a set of formulas. Get comfortable with table lookup, graph theory, big data, and machine learning and others.

-Chapter 2. Language Selection

When a little arrogance knocked literature student, you can begin to practice. Rushes to LISP, or other functional languages is not necessary - the first is to get used to the principles of AI design. To quickly explore and further development, then it is perfectly suitable Python is a widely used high-level programming language that easy to work with it; most commonly used for scientific purposes, it's convenient for solving mathematical problems with it; you will find plenty of libraries for it, that will facilitate your work.

-Chapter 3. Experiments on AI

Now we go directly to the AI theory. They can be divided into 3 categories:

• Weak AI - Bots, which we see in computer games, or simple improvised assistants like Siri. They either perform highly specialized tasks or are minor, such a complex, unpredictable and any interaction puts them in a deadlock.

• Strong AI - this machine intelligence is comparable to the human brain. To date, there are no real representatives of this class, but the computers like Watson and Deep Blue are very close to achieving this goal.

• Perfect AI - future brain machine that will exceed our ability. It is about the dangers of such developments warn Stephen Hawking, Elon Musk and movie franchise, "Terminator".

Of course, you should start with the most simple bots. To do this, remember the good old game "Tic Tac Toe" using a 3x3 field and try to find out for themselves the basic algorithms of action: the probability of winning if error-free, the most successful places in the field for the location of the figures, the need to reduce the game to a draw, and so on.

Having played a few dozen games, and analyzing their own actions, you should be able to allocate all the important aspects and rewrite them into machine code. If not, keep thinking.

By the way, if you still took up the Python language, you can create a fairly simple robot can be turned to manuals on the Internet. For other languages, such as C++ or the Java, you will also not be difficult to find a material step by step. Sensing that the creation of AI there is nothing supernatural, you can safely proceed to personal experiment.

-Chapter 4: Moving on

Now, when it moved from the dead point, you will probably want to create something more serious. This will help a number of the following resources: Diffbot; Google Cloud Prediction API; Mallet, etc. As you have seen, even from the names, this API, which is enabled with no waste of time to create some semblance of a serious AI.

If you don't know, API is a set of subroutine definitions, protocols, and tools for building application software. In general terms, it's a set of clearly defined methods of communication between various software components. A good API

makes it easier to develop a computer program by providing all the building blocks, which are then put together by the programmer.

-Chapter 5. Working

Now that you have quite a clear idea of how to create and AI than with the use, it is time to display our skills to the next level.

Firstly, you must learn to work with the appropriate libraries of selected programming language. For Python we are considering Scikit-learn, NLTK, SciPy, PyBrain and Numpy. Secondly, will not dispense from the development of functional programming. And most importantly, you can now read the literature on AI with full understanding of the case: Artificial Intelligence for Games by Ian Millington; Game Programming Patterns by Robert Naystorm; AI Algorithms, Data Structures, and Idioms in Prolog, Lisp, and Java by George Luger, William Stbalfild; Computational Cognitive Neuroscience by Randall O'Reilly, Yuko Munakata; Artificial Intelligence: A Modern Approach by Stuart Russell, Peter Norvig.

And yes, all or almost all of the literature on this topic is presented in a foreign language, so if you want to engage in the creation of AI professionally - you need to pull up your English to the technical level. However, this is true for any field of programming, is not it?

The rest of your future development will depend only on the practice and the desire to complicate algorithms. But be careful: perhaps the perfect artificial intelligence is dangerous for mankind?

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ARCHITECTURAL PATTERNS IN SOFTWARE DEVELOPMENT

The modern word is inundated with various programming tools and technologies. Considering this diversity, programmers are able to develop great, complicated and highly functional software. Hence the necessity of structuring big projects has occurred. In order to solve this problem software architectural patterns were created.

An architectural pattern is a general, reusable solution to a commonly occurring problem in software architecture within a given context. There is a wide range of architectural patterns, which are classified into many groups. However, there are three of these patterns, which are considered the most popular: MVC, MVP,

MVVM. The patterns mentioned above are commonly used in web, mobile and desktop applications. They will be discussed in more detail.

MVC, MVP and MVVM are layered style patterns. Their main idea is to decouple project structure into three main components: business logic of the application, user interface (UI) layer and the application layer, which holds the interaction between the app's logic and the UI.

The implementation of these patterns gives such benefits as:

- Ability to develop the interface and logic simultaneously;
- Increased testability;
- Code's reusability;
- Manageability. The UI might be changed without influencing the app's logic.

Although these patterns share the basic idea, each of them has its specific peculiarity.

MVC stands for Model-View-Controller, this pattern may be called the classic architectural pattern, since it is the most widely used. The components of MVC perform their individual duties.

Model. The Model component represents entities of project subject area. It also defines rules for transactions with database or any other external storage.

View. The View itself represents the set of user interface controls on the screen. It is the only layer, which interacts with the user directly. MVC concept implies View as a component, which is able to connect Model straightforwardly, request any Model's data and transform it to interface.

Controller. The Controller is responsible for processing the user's request. It normally serves as a mediator between Model and View. This component gets user's data via View, send it to Model and post new data back to the UI layer. One Controller can interact with several Views and define the appearance of the Views.

MVC is considered to be complex, thus developers need to spend enough time to understand the whole idea. Although the pattern's concept describes decoupling, it does not allow developers of the Model ignore the structure of the Views. It may be found difficult to debug MVC architecture application in order to event-driven nature of the UI code.

The MVC pattern is native architectural decision for Android and IOS mobile development. It is also frequently implemented in web applications; therefore, there are many MVC web frameworks such as Angular.js, ASP.NET MVC, and Ruby on Rails.

The other pattern is MVP (Model-View-Presenter). It is the descendant of MVC design. The Model handles the same responsibilities as in MVC.

Here the View also describes the interface and displays the Model's data; however, unlike the MVC's View component, it interacts nothing but the presenter.

The presenter can be imagined as a transformed Controller. It creates the liaison between View and Model, redirect user's input from View to Model and pass

processed data back to the View. The View and the presenter are completely separated and communicate to each other by an interface.

The disadvantages of MVP are similar to the disadvantages of MVC pattern.

Although the MVP pattern performs decoupling more efficiently than MVC, it is not commonly used in the web development. This pattern has implementation for Windows Forms, Silverlight and ASP.NET Web Forms in .NET environment and in different Java, PHP frameworks.

MVVM is the newest pattern among considered above. It divides an application into three components: Model-View-ViewModel. It supports two-way data binding between View and ViewModel, which allows automatic propagation of changes inside the state of ViewModel to the View.

Typically, the Model performs the same duties as Models in MVC and MVP do. The View receives data through the data binding system and display it to the user by the UI controls.

The ViewModel is responsible for defining methods and functions that assist in maintaining the View's state, triggering events in the View and manipulating the Model as a respond to changing of the View.

Thanks to data binding system, MVVM provides automatic connection between the View and the ViewModel, but pattern's creator John Gossman himself points out possible problems of data binding. He states that the system in large applications can result in considerable memory consumption.

The MVVM pattern is used by Windows Presentation Foundation, Silverlight and implemented in Java frameworks for Android. There are also frameworks for web development like KnockoutJS.

Choosing the architecture of the future application, developers ought to set tasks clearly and estimate the given capabilities of used technologies. Traditionally, web developers use MVC pattern, desktop applications provide MVP and MVVM solutions and mobile developers implement different patterns, though MVC is preferable and the classic one for mobile applications.

The architectural patterns are designed to help programmers create pure, cohesive and maintainable solutions but it is still up to developers whether to use provided advantages or not.

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SMART HOME MODERN TECHNOLOGIES

We live in era of discoveries in the technological world. New technologies and the Internet penetrate our life, they help us with our work, studying, hobbies, household chores etc. The modern world is full of gadgets, services, mobile solutions called upon to make communication, free time more efficient and productive. Smart home is a modern technology that makes our life easier. It is the technology that helps to automate simple and routine things.

Smart home allows us to make interaction with other technologies in our home easier and more comfortable. When you get home your smart house will already be waiting for you: lighting has already been put on, music of your mood is playing and ready-made coffee is waiting for you. Devices that create a network of smart home, are able to automate ordinary household chores. A couple of another examples: In the morning alarm clock rings, curtains open, lights and radio turns on, and breakfast is also being prepared. And all this is done without your participation. A smart house consists of many devices. This technology has a "heart" that controls everything, sensors keep track of the parameters of your home and "smart" things like bulbs, lamps, household appliances, furniture with an integrated "smart" component and much more.

A large number of solutions for home automation have already been produced for the consumer market by large manufacturers and brands. For example, smart bulbs and lamps have already been presented on the market. First idea of light bulbs for a smart home was presented by Philips. Philips HUE lamps were one of the first devices to create a smart home. As early as in 2012, these devices could track the location of people and animals in the room, automatically adjust to the current task (the person sat in a chair and lamp lit), accompany the person from the room to the room (the light puts on in front of you and goes out behind you).For these tasks, the lamps were connected to the network using a special controller, which had to be connected to your router [2].

Now there are a lot of devices for a smart home; starting from sensors, finishing with smart home appliances.

Even the large IKEA brand represented furniture with smart stuff, and now the company has announced a line of Trådfri smart devices. LED bulbs, remote controls, motion sensors, dimmers, floor and ceiling lamps, and special LED panels that can be installed in cupboard [1].

Companies like Apple and Google have already integrated the gadget support for smart home into their platform - Apple Home Kit and Google Home, respectively. Now every user has the opportunity to turn his house into a complete automated system.

For enthusiasts, there are open platforms, such as Arduino, Raspberry Pi and many others. These platforms allow you to create your smart devices and their management system. These platforms have open source code, which makes it possible to use ready-made developments to realize your own goals, and these platforms have a low entry threshold for new users because they have a large number of lessons starting from the basics. If you are interested in creating such systems, you can always try yourself using one of these platforms. If you want to develop something new in this area Arduino and Raspberry Pi will be the best choice for your ideas.

Now a smart home can help you to save time on doing daily tasks and make their fulfillment more interesting. This is a technology that is no longer remains fantastic but is available to everyone.

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UDC 681

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THE ANALYSIS AND THE EFFICIENCY INCREASE OF PAPER AND CARDBOARD PRODUCTION TECHNOLOGICAL PROCESS

Cardboard is a solid sheet or ribbon-like material with mass more than 250 g/m2. According to the accepted classification in Ukraine cardboard is divided into groups: containerboard, printing and office, electrical, civil, structural, roofing and waterproof, cushioning, filtering, textile, footwear.

The material for manufacturing cardboard is predominantly semi-finished products with the intermediate product for the production of paper: brown wood, polycellulose, hard sulphate pulp and waste paper. Cardboard is made of prepared mass with the help of machines (plane and cylinder) in the form of continuous dried cardboard tape.

The assortment of cardboard takes an important place in the economy of modern production. It is produced to pack the various food products, as well as to manufacture the objects of everyday life. Therefore, the development of global paper industry is relatively rapid. Its products are updated regularly every 2 years, and it occurs every 12-15 years. The world average consumption of paper and paperboard

per capita per year now is more than 52 kg, in Europe it is 250 kg, in the USA it is 365 kg, while in Ukraine it is 38 kg only. The power of the domestic paper industry is almost 1.0 million tons of paper and cardboard per year. It allows to produce more than 30 kg of cardboard and paper products per capita.

The given-paper considers the automation technological process at production containerboard using multi-cylinder flat grid machine.

The analysis and the efficiency increase of paper and cardboard production technological process is done. Temperature control, condition and weight of the waste paper, temperature in the drying process, the condensate level and the engines, dampers and other execlutive mechanisms are considered.

The machine headbox is the main unit of the board. The speed of the mass flow flowing from the headbox, is highly recommended to be stabilized with high accuracy, since it has to do with the speed of the grid machines using the ratio, which affects the quality of the cardboard canvases in a wet condition. The rate of mass flow that flows from release slit of the headbox, depends on the level of mass in the chamber and air pressure in the air cushion. If the air pressure in the air cushion is stabilized, the rate of mass flow through release gap will depend on the level of the masses. The weight management of waste, the water consumption and the masses, the temperature in the drying part and the level of condensation are performed due to the sensors. The proposed system of automatic control can be implemented based on analog or digital automation

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INTERNET THREATS AND SOFTWARE FOR THEIR BLOCKING

The goal of this study was to investigate teenagers' involvement into internet activities, threats, which they can face, and technological ways of preventing the threats.

Information technologies have rapidly entered various areas of modern life, extending communication, spatial and temporal boundaries, opened new opportunities for communication, education, work, leisure and creative self-fulfillment. Along with adults, children became active Internet users. There are many online resources for development, education and entertainment of children. The Internet has become an active assistant for children and teenagers with homework, projects, movie watching and communication. Internet activities of children are studied by sociologists, educators, IT technologists and others. According to the latest public opinion surveys the greatest amount of time spent by a child on the Internet (52%) accounts for social networking, the lowest (9%) - for search of information for studies [1].

Though online activities become an effective educational and communicational tool, children can facet here such threats such as:

- criminals on the Internet establishing contact with kids in chat rooms, via instant messaging, emails or the forums;
- viruses, worms and "Trojans" - computer programs that can harm a computer and data stored on it. These programs can also use the recipient's computer to spread their copies on other users' computers
- phishing - the activity of defrauding an online account holder of financial information by posing as a legitimate company;
- internet fraud - used by hackers technique, which is that a false email includes a link that leads the user to a fraudulent site for passwords, credit card numbers and other sensitive information, which can then be used to harm for the user [2];
- gambling – playing games for money;
- online piracy - the illegal copying and distribution (both for business and personal purposes) materials protected by copyright, such as music, movies, games or applications - without permission.
- trolling - placing messages intended to foment conflict between users in forums, chat rooms, in comments to entries in blogs;
- materials of pornographic, insensitive content, materials of suicidal direction.

An open Internet is unsafe for children, and parenting in this digital age is difficult. Taking it into consideration IT companies provide parents with a wide range of tools to control unwanted content and a safe Internet for their families. The software they develop can block web sites in more than 70 categories, including pornography, gambling, drugs, violence/hate/racism, malware/spyware, phishing, force safe search on all major search engines, set time restrictions to block web access during designated times

Very helpful in this respect is designing by leading IT companies of new equipment for preventing harmful effect of the above-mentioned threats. The software available makes parental control possible and effective.

Due to them parents can help their kids stay safe online by setting up child accounts for them and adding them to your family at account.microsoft.com/family. This can make adults sure that their kids d onot see any websites, apps, or games that are inappropriate for their age. Adults can view reports of their online activity, and help them establish good habits by setting up limits on how long and when they can be spending time with their screens [3].

Another way is creating a Supervised User accounts on the Chrome browser that allows to set limits for the websites children can visit, as well as to keep a log of their online habits. For Android tablet it is a similar feature called a Restricted User account.

Another useful setting is a Screen Time. As the name suggests, this is a way to control how long a child can use the PC on any given day. Once you have turned on the Set limits for when your child can use devices option you will be able to click on the grid below to set certain times each day that the account will allow access. The granular method means you can adjust it so that they have more, or less, time on the weekends, and what hour of the evening they have to stop in the week.

Web Browsing setting is a content filter that once enabled will protect a child from inappropriate sites and media. It also allows adding a further level of control by choosing the *Only websites on the allowed list* option, where parents can then enter which sites they are allowed to visit, and ones that are forbidden [3]

This setting filters the content that the child can access in the Windows store. The general setting blocks adult content, while the child can buy, then download or stream apps, games and media appropriate for: option allows you to set the specific age of content from a drop down menu [2].

The results of the investigation done show that development of software is an effective tool against internet threats.

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UDC 62-9

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COMPARISON OF UNMANNED AERIAL VEHICLES

An unmanned aerial vehicle (UAV), commonly known as a drone, is an aircraft without a human pilot aboard [1]. Over the last 30 years, the number of UAVs in the world has grown exponentially. Most of the applications are used in the military sector and the civilian sector. And of course, in the DIY (do it yourself) sector where there are thousands if not millions of users developing all kinds of software and hardware platforms for UAV's. In 2016 the Federal Aviation Administration predicted the growth of the number of civilian drones to 15 billion by 2020. There's widespread interest in UAVs. In fact, there were 15,000 drones sold in the US alone every month. The sphere of apply usage includes agriculture, photography, inspection, construction, border patrols and producing movies. So, nowadays almost everyone can have a drone at home. And it raises a problem of choice. Which drone to choose?

To find out which UAV is the most optimal for professional and everyday usage we will compare the features of three different drone`s models: DJIN Phantom 2 Vision+, Parrot AP Drone, Blade 350 QX2. All submitted models are intended for taking aerial photography and shooting video, also delivering small payloads.

1. Flight time

“Flight Time” refers to the amount of time a drone is able to fly on a single charge [2]. There are several factors that determine a particular drone’s flight time (battery size, weight, and flying maneuvers). The flight time measurement gives the amount of time the drone will fly with no additional weight added, so if additional weight is added, the flight time decreases. DJIN Phantom 2 Vision+ has 25 minutes of flight time; Parrot AP Drone – 12 minutes; Blade 350 QX2 – 10 minutes.

2. Operating range

Operating range means the maximum distance the drone will travel from the transmitter without losing connection [3]. You can operate DJIN Phantom 2 Vision+ on the distance of 610 meters, Parrot AP Drone – only 50 meters and Blade 350 QX2 – 800 meters.

3. Payload capacity

“Payload capacity” is the weight of the cargo the drone can carry [3]. It is one of the most important characteristics due to direct purposes of this type of drones. The ability of lifting heavy loads gives you an opportunity to improve your drone`s options by adding better digital camera to it, for example. Also you can use a drone directly for transporting cargoes. DJIN Phantom 2 Vision+ can carry around 300 grams; Blade 350 QX2 – around 250 grams; Parrot AP Drone lifts around 180 grams.

4. GPS sensors

GPS sensors are usually only found in expensive drone models, and are really useful [2]. They allow you to use features like “Flight planning”, “Return Home”, “Automatic landing”. The GPS sensor is presented only in DJIN Phantom 2 Vision+ so only this drone has these functions.

5. Camera specs

All of chosen UAVs have onboard cameras. For Camera comparing, we have chosen three characteristics: the number of effective pixels, video resolution and FOV (the field of view).

Consider the number of pixels the sensor uses specifically to capture image information [3]. It will generally be lower than the number of total pixels for the camera. The first two models have the same quantity of pixels – 14 Megapixels, and the third one - Blade 350 QX2 has only 2 Megapixels.

The display quality of the built-in camera's video image [3]. Drones tend to have high-definition cameras which will display in either 1080p or 720p. There are very few drones that offer 4K resolution. All of above mentioned three drones have equal video resolution – 1080p.

The field of view is a measurement of the subject area for the drone's built-in camera[3]. A wider field of view means the drone camera sees more. All of the chosen UAVs have different angles of view: DJIN Phantom 2 Vision+ has 110º/85º; Parrot AP Drone – 92º; Blade 350 QX2 – 120º.

Also all of these models are equipped with Stabilization gimbal that holds camera steady.

6. Price

The chosen drones belong to different price categories. The most expensive is Blade 350QX2 – 1099, 99$. The second is DJI Phantom 2 Vision+ with price 649$. And Parrot AP Drone costs only 190$.

Taking into consideration all above mentioned we can state that it's preferable to choose DJI Phantom 2 Vision+. It has better Camera specs and sufficient Payload capacity, which are ones of the most important characteristics because of purpose of these UAVs. Moreover, it has GPS sensors, which allow you to use such necessary functions as “Flight planning”, “Return Home” and “Automatic landing”. Overall, the DJI Phantom 2 Vision+ is the best drone available for consumers. It comes with everything you need to fly, and it performs phenomenally.

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NANOTECHNOLOGIES OF FUTURE

Research in the field of nanotechnology has increased over the last decade.The idea of nanotechnology appeared in 1980s in studies of E. Drexler who worked at the laboratory of artificial intelligence at Massachusetts Technical Intstitute.

Nanotechnology is the biggest achievement of modern science associated with scientific and technological revolution of the third millennium. The term “nanotechnology” began to be used by the Americans in the 1980s. The term “nano” means tiny or billionth (10^{-9}). In 1905 the Swiss physicist Albert Einstein published a study which showed that the size of sugar molecules equals to about one nanometer (1 nm = 10^{-9}). Let's imagine that a nanometer:

- It is a million times smaller than the length of the spine.
- Thickness of a sheet of paper is about 100,000 nanometers.
- The diameter of a red blood cell is 7000-8000 nanome.

Nanotechnology is widely used in nanoelectronics nanotubes. Carbon nanotubes are ideal candidates for the role of elements for electronic schemes due to the unique physical properties and structural features.Main potential of nanotubes in

nanoelectronics is the ability to create submicron elements for electronic circuits – nanotransistors, nanodiods, nanocatods. American company Nantero introduced a new type of computer memory which also uses nanotehnologies.

In the near future, nanotechnology will become one of the driving forces of innovation in medicine and pharmacy. Growing number of publications and patents in nanotechnology has been increasing for 10 years almost 6 and 12 times, respectively. In 2004 the global turnover of nanomedicines was estimated as 6 billion dollars. Over 50% of pharmaceutical manufacturing companies working in the direction of nanomedicine use NI to develop delivery systems APIs to organs and target tissues (80% of turnover in the global nanomedicine).

Nanotechnologies have great potential . They can make our life easier, protect human being from bacteria and viruses, achieve great success in automation solving the problems that a person is no table to perform. By 2020 the global nanotechnology market will grow up to $ 75.8 billion.

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UDC 681.3

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KEY TRENDS OF SMART HOME DEVELOPMENT

In today's world technology is advancing with a fast pace, radically changing our lives. A lot of companies which produce various household appliances and gadgets implement some kind of artificial intelligence technologies in them. Moreover, these devices can be linked into a single network. This enables them to "communicate" with each other and with the host, thus forming a system of "smart house".

Of course, such systems are a far cry from real smart homes from science fiction shows, where systems of artificial intelligence behave like a human, fully in charge of the house and are able to create Virtual Reality. But this is only the beginning.

In the past the concept of "smart home" often meant a system of remote control of light, heating and washing machine. Today this concept has become much wider. Nowadays there are "smart" materials, programs for smartphones that allow you to control appliances at a distance. They can do cleaning for you and many more. We have identified three main technologies that can change our houses and become their integral part in the future.

1. Smart materials for smart homes.

All surfaces in the homes of the future will be made of "smart materials". They will have many different functions. For example, the walls will be able to prevent leaks of Wi-Fi signals. So no one will be able to hack your home network or make use of your Wi-Fi network. French researchers from the *Institut Polytechnique de Grenoble* have created wallpaper, which can help prevent from electromagnetic pollution and "stealing" your Wi-Fi. Special paper blocks the Wi-Fi signal, thus not allowing it to go beyond the walls of particular rooms or houses.

The windows of our houses will also become multifunctional. New technologies are gradually turning them into huge transparent screens. This technology was presented at CES 2012. *Samsung* Professionals have developed a *Smart Window* – the window, which, as the journalists said – resemble "a giant virtual translucent tablets".

Another hi-tech development in this area is *Gravity Space floor*, which is able to recognize people by their weight. This floor represents a big screen on which, for example, may appear a hologram of a virtual ball, if you want to play football.

2. Smart appliances of a smart home.

Appliances at the smart home will also be multifunctional. For example, on the screen of a refrigerator human will be able to look for recipes, leave notes and many more. In 2013, *Samsung* unveiled the *T9000* refrigerator, which runs on the *Android* system. On the screen of the fridge one can not only find recipes, but also view Google calendar, make notes in Evernote, listen to music and even send tweets.

Generally speaking, home appliances will be intelligent and they can be managed not only with help of a touch screen, but also by receiving voice commands. One of the recent artificial intelligence technologies for the home is "*Cleopatra*". With its help the house can recognize quite a lot of voice commands such as "Turn on the lights in the living room", "Reduce the temperature to 18 degrees" and so on. In addition, with built-in motion sensors and a built-in sensor in the owner's wrist watch, the house will be able to recognize when the owner is approaching home and unlock the doors automatically. Also, for example, "*Cleopatra*" can notify about missed calls, remind you about various events, etc.

Today majority of appliance manufacturers supply their products with remote control systems through which we can turn on or off a particular appliance by simply pressing a button on the smartphone screen. Pretty soon these technologies will allow your smartphone to control all appliances in the home: starting with coffee machine and ending with the door lock.

3. Intelligent robot assistants.

If vacuum cleaner robots already are becoming routine, assistant robots that are able to do all the housework for you, are yet to become a reality. Moreover, such General-purpose assistant robots like in the movie "*I, robot*" are still very far. But this does not mean that in the nearest future our smart home will have such a multi-purpose robotic assistant. Some examples of assistant robots are the following: *Hector* is able to remind elderly people to take pills; *Rumba* robot itself cleans up the floor, and *the Mint* robot washes; *Mirra* robot cleans the pool.

Regarding humanoid robot assistants, they are still a far cry. The only already working humanoid assistant robot is *Asimo* from *Honda*. The truth is that the list of capabilities is rather limited. Nevertheless, this robot cannot be bought, but only rented.

Of course most of us will say that the technology of "smart home", even in developed countries, will not receive a wide distribution soon; and Ukraine is far behind. Now in Ukraine there are some companies which offer advanced experience in systems of this type. So maybe very soon you will be able to enjoy the benefits of "smart home".

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USING SIMULATED ANNEALING IN ANT COLONY OPTIMISATION ALGORITHMS

An algorithm of simulated annealing is a general algorithmic method of solving a global optimization task, especially discrete and combinatorial optimization, where procedure of searching of global solution imitates a physical process of annealing.

Basic principles of simulated annealing algorithm may be explained with help of the next physical analogy. Fig.1. shows a ball in the box. Inner surface of the box fits the shape of target function. When heavily shaking the box horizontally a ball can move from any point to any other. Gradually decreasing shaking power will reach the point enough for moving the ball from A point to B point but not enough for moving the ball from B to A. Keeping on decreasing shaking power to zero will cause keeping the ball in B point, which is the point of global minimum. In simulated annealing algorithms an analogue of shaking power is the probability of moving to a state with higher value of target function. During working of the algorithm the probability of moving to another state decreases according to the chosen rule.

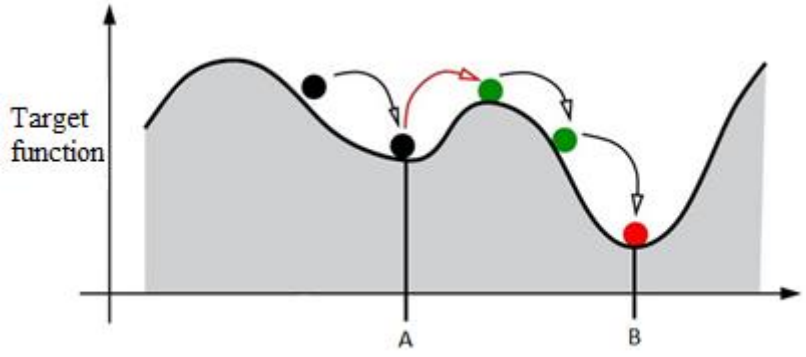

Fig.1. Principle of simulated annealing method

Algorithm of simulated annealing in the process of searching the best solution allows probable moving to the state with worse (in case of minimization — with higher) value of target function. This property allows coming out from the local optimums.

The algorithm doesn't guarantee function minimum to be found, however as a rule, the initial value improves. After combining simulated annealing method with ACO (ant colony optimization) algorithm we can use this property for improvement of certain parts of path found with help of ACO algorithm.

ACO algorithm is on of the effective polynomial algorithms for solving a travelling salesman's problem and for solving tasks of searching routes on graphs. The idea of this approach is based on the behavior of ants seeking a path between their colony and a source of food.

The algorithm is based on behavior of ant colony, i.e. marking of appropriate path with high quantity of pheromone. The work begins from placing ants in nodes of graph (cities). Then ants begin their movement. Its direction is determined by the probability method and the formula:

$$P_i = \frac{l_i^q \cdot f_i^p}{\sum_{k=0}^{N} l_k^q \cdot f_k^p}$$

where:

P_i — probability of using an "i" way,

— desirability of "i" way(typically $1/d_i$, where "d" is distance),

— amount of pheromone on "i" way,

q — a parameter to control the influence of ,

p — a parameter to control the influence of and

q+p=1

The result isn't precise and may be even one of the worst. But thanks to probability of the solution, reiteration of the algorithm may return quite precise result.

In the natural world, ants of some species (initially) wander randomly, and upon finding food return to their colony while laying down pheromone trails. If other ants find such a path, they are likely not to keep travelling at random, but instead to follow the trail, returning and reinforcing it if they eventually find food.

Over time, however, the pheromone trail starts to evaporate, thus reducing its attractive strength. The more time it takes for an ant to travel down the path and back again, the more time the pheromones have to evaporate. A short path, by comparison, gets marched over more frequently, and thus the pheromone density becomes higher on shorter paths than longer ones. Pheromone evaporation also has the advantage of avoiding the convergence to a locally optimal solution. If there were no evaporation at all, the paths chosen by the first ants would tend to be excessively attractive to the following ones. In that case, the exploration of the solution space would be constrained.

The overall result is that when one ant finds a good (i.e., short) path from the colony to a food source, other ants are more likely to follow that path, and positive

feedback eventually leads to all the ants following a single path. The idea of the ant colony algorithm is to mimic this behavior with "simulated ants" walking around the graph representing the problem to solve.

What can be done for optimization? We can use parallelization. This approach lets increase significantly the speed of getting a final result. There are a few ways of parallelization of ant colony algorithm:

- Global single populated. It means there is one single population on the CPU main core and the calculation of target function is parallelized on several cores.

- Single populated. Path searching for each ant takes place on a separate core in the same way as counting of it's length and refreshing of pheromones on it.

- Multi populated. There are multiple independent populations on each core and ants of each population search their ways. After each ant of population has founded the way, refreshing of pheromones begins on paths of this population.

Ants of the same core are generally called a colony. After each colony has finished their work it is possible to calculate the best solution of each colony and share information about the shortest path and amount of pheromone on graph edges between other colonies. In addition we can try to share this information not at each step but after a certain period of time.

Innovative is the fact that ants within every separate colony may have different amount of pheromones. For example, in the first colony the amount of pheromone that each ant has may be 1, in the second colony each ant may have 2 pheromones and so on. The purpose of the thesis is analyses of influence of this experiment on the algorithm. Also after some interval of iterations the genetic algorithms may be applied to our previous decision and we may begin to shuffle ants among colonies that have diverse amount of pheromones.

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ANALYSIS OF REAL TIME ELECTRONIC VOTING SYSTEMS

As technology has moved forward in several aspects of our lives, the increase in use of mechanics and electronics has also emerged. The use of mechanics in the area of voting was introduced as early as the 1890s with the invention of the Herman Hollerith punch card machinery for the US census, and later developed into electronic voting. Electronic voting, or e-voting, is a term encompassing several different types of voting, embracing both electronic means of casting a vote and electronic means of counting votes.

As the area of voting has evolved from public voting, in the early US, to the use of paper ballots with mark choices, the area of electronic voting has also evolved. Electronic voting has changed from the use of punch cards to the use of optical scan systems and specialized electronic voting kiosks (including direct recording electronic voting systems). Electronic voting can also involve remote transmission of ballots via telephones or private computer networks, and the latest development is voting over the Internet.

Electronic voting technology at polling stations can speed up the counting of ballots and provide improved accessibility for disabled voters. A voting system providing remote voting via the Internet could improve the accessibility and provide an even more convenient voting process. It might also lead to greater voter turnout in elections, as well as phase out existing cumbersome (and insecure) processes of absentee voting.

The promises of accuracy, security and precision have driven electronic voting systems forward. However, the worries of corrupt or manipulative software have held back widespread adoption of several systems. Especially Internet voting schemes are discussed and criticized. There are many threats and issues with attacks and fraudulent behavior, including network attacks compromised computers and corrupt system components.

In recent years electronic voting has become a very popular and hot research topic. The electronic mean of counting paper ballots has existed for a while now, but the focus now is more on how to cast electronic ballots. Voting via direct recording machines or the Internet could also decrease the use of paper ballots and the manual work of preparation (no need of printing ballots in different languages, etc.) The correctness of these systems is also critical, as there is no room for errors in the electronic recording or counting of ballots.

Electronic voting exists in different forms already, including tallying votes by computer, using electronic equipment in polling stations and voting over the Internet

from the voter's own computer or mobile device. There are several types of modern electronic voting systems: optical scan systems, systems to electronically cast ballots, end-to-end verifiable voting systems, Internet voting systems, which have their own nuances, advantages and disadvantages.

The use of electronic means to cast a vote has many advantages. Using an electronic voting machine at the precinct would reduce the use of paper ballots, as the machine that displays the ballot electronically. It would also make it easier to prepare special ballots for other languages or visually impaired voters programmed into the system, instead of printing out several options. The newest development in the area of e-voting is using the Internet for remote voting. By making the voters able to vote from their homes computer one of the goals is to improve the accessibility for disabled voters, as they don't have to actually go to the polling station. The overall participation would probably also increase because of the more comfort of voting from home, and it would maybe be more appealing to the youth doing the voting electronically.

As we see the use of computers for voting has many advantages, but a system for electronic voting requires means to preserve every aspect of a traditional voting scenario when it comes to security aspects like authentication, secrecy and anonymity. The system has to prevent attacks, errors and any electronic fraud.

As all information systems, an e-voting system is also vulnerable against computer attacks. Although Internet voting may improve several election factors, there are concerns that the benefits are outweighed by the issues of many potential security threats. The security flaws often concern the voter's home computers, and that these are the weakest link because people do not keep their personal computers secure.

Electronic voting systems have many functions, including encryption, randomization, communication and security systems. Cryptography can be used to protect the communication between the user's browser and the election server, to ensure privacy, and for verification purposes. The technology of cryptography is relied upon to ensure integrity and confidentiality of network traffic.

The advantages and benefits of real-time electronic voting systems could be outweighed by the issues of the many potential security threats. There are critical security threats to electronic voting systems, but developed secure cryptographic methods and techniques (symmetric encryption, hash functions, public key encryption, digital signatures, digital certificates and so on) can provide secrecy, integrity and proofs of correctness, countering many of these potential attacks.

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ONLINE LEARNING PLATFORMS: A RETROSPECTIVE AND PROSPECTS

The paper is devoted to the online education platforms that play an important role in today education. Some retrospective and future trends of their development are presented. The kinds of online platforms and their essential features are also under consideration.

Nowadays online education is becoming more and more popular all around the world. As we know, technology has changed the way we do our day-to-day activities, such booking tickets, banking, networking etc. Another factor influencing the development of this type of learning is changing the way we work. To make a successful career young people have to keep up with all innovations via online learning. As a result, there are many platforms with courses which help millions of people improve skills or even gain new ones. What is more, if you are not able to get a degree or qualification that you like or you have not any opportunity to go to another city or study at a prestigious university, online education is really useful.

Online platform is a specially developed platform which uses Internet technology for the design and development of teaching and learning purposes. [4, c.5]

"A learning platform is an integrated set of interactive online services that provide trainers, learners, and others involved in education with information, tools and resources to support and enhance educational delivery and management".

The best-known online platform is Coursera. There you can find courses in various areas of knowledge. The project offers the courses in Physics, Engineering sciences, Humanities and Arts, Medicine, Biology, Mathematics, Computer Science, Economics and Business. In addition, there are many other online platforms, such as:

- ✓ Prometheus
- ✓ edX
- ✓ Udacity,
- ✓ MIT OCW,
- ✓ Stanford online.
- ✓ Course Buffet

The platforms function as an online classroom where instructors can hold discussions, upload readings, show videos and play audio, carry out learning activities, make announcements and assess and grade student work. They store and deliver materials developed in a variety of different formats — everything from MS Office documents to videos and third-party applications. They support synchronous (at the same time) and asynchronous (not at the same time) interactions between faculty and students and students and students [2, c. 50]. Online learning management

systems can be hosted locally or remotely, “in the cloud” (Moodle Rooms or Blackboard).

In fact, since 1728 the concept of distance education has remained the same: only communication channels have changed. Almost three hundred years ago Mr. Caleb Philips became the first organizer of the distance education system, placing an announcement in the Boston newspaper about recruiting students from the suburbs for quick writing and accounting courses [3, c. 10]. Lessons were sent by regular mail once a week. Favourable conditions for development of distance or online education was the regular postal services. Phillips's ad itself looked like this:

.. All citizens who wish to receive these skills,

 can be trained as well,

 as if they lived in Boston,

 with the help of several lessons,

 weekly mailed ..

Not long time ago all online training used to be very simple: here is a lecturer, he reads papers, sometimes drinks water, and we record the video and upload it onto the YouTube. Nowadays new key players in online education are developing their own LMS - Learning Management Systems. And these systems have to be constantly updated. Essentially all LMSs have “standard” or typical and uniform features, including:

- Analytics (with varying degrees of quality)
- Apps
- Assignment submission
- Discussion forum
- File upload/ download capacity
- Grading
- Instant messages
- Online calendar
- Online news and announcement (institution and course level)
- Online quiz
- Wiki
- Widgets that allow connections to social media [1, c. 44]

It should be mentioned that online education platforms even offer people to get a certificate of completion. So if you want to continue your study or get a specialized training, these certified centers of online education could provide you with all necessary learning materials, test your knowledge and skills and issue a certificate.

In conclusion, we would like to say that online education platforms are a great source of various means for study encouraging the motivation and well-balance development for learners. The future trends of online education will be connected with development of new software and applications for testing practical skills, diversification of learning facilities and even assistance in employment.

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THE GENETIC ALGORITHM. THE ISLAND MODEL OF GENETIC ALGORITHM

The genetic algorithm (GA) is an evolutionary search algorithm which is used for solving optimization problems. GA is based on Ch. Darwin's principles of natural selection. GA is a stochastic method. These algorithms are successfully applied in various fields (economics, physics, engineering sciences, etc.). Different versions of GA are created and a number of test functions are developed.

The idea of using analogue of evolution mechanisms lies in the basis of genetic algorithms for finding solutions. As it is known, the basic concepts of the evolution theory are heredity and natural selection. The same mechanisms are used in GA for finding the solution.

The work of GA can be described in such stages. At the beginning the population is initialized in a random way. The population has such characteristics as quantity, number of genes in every individual and their category. Individuals of a population are estimated according to the selected criterion and the result of the estimation determines their fitness. The higher the fitness of an individual is the greater the chance is that it will participate in the crossing. When crossing two individuals "the exchange of genetic information" takes place. This means that relevant genes exchange their bits. This operation is called crossingover. Mutation is all the same as reproduction. There is some a part of mutants m, which is a parameter of genetic algorithm and at the stage of mutations pm individuals should be selected, and then they should be changed according to predetermined operations of mutation.

The descendents received as a result of crossing make the next generation instead of the previous one, and everything is repeated from the very beginning, but this time for the newly created generation.

Basic principles of GA are enclosed in the following chart (Fig. 1)

1. Generate initial population of n chromosomes.
2. Calculate suitability of each chromosome.
3. Choose a pair of parent chromosome using one of the selection methods.
4. Cross over two parents with probability of pc, producing two offspring.
5. Conduct the mutation of descendants with probability pm.
6. Repeat steps 3-5 until a new generation of a new population containing n chromosomes is generated.
7. Repeat steps 2-6 until the criterion of the process completion is reached.

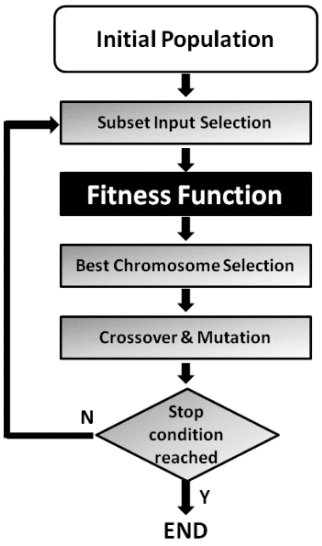

Fig. 1. Scheme of a simple genetic algorithm

At the end of the work the best adapted individual in a population, or rather its genes will represent the solution of the problem, found with GA. Mechanisms underlying the GA can not guarantee finding the best solution, but they are likely to find one of the best decisions.

The island model is the most common model of parallel GA. Its essence is that the population composed of a very large number of individuals is divided into subpopulations of the same size. Each subpopulation is processed with a separate processor with the help of one of the varieties of GA nonparallelism. Sometimes, for example, in five generations the subpopulations will exchange a few individuals. Such migration allows subpopulations to share genetic material.

Introducing migration into the island model allows us to find various dominant individuals in subpopulations. It helps maintain diversity in the population. Each subpopulation can be regarded as an island. During migration subpopulations share their dominant genetic material. Under intensive migration of a large number of individuals mixing of genetic material takes place. Thus local differences between the

islands are eliminated. Very rare migrations do not allow us to prevent premature algorithm convergence in small subpopulations.

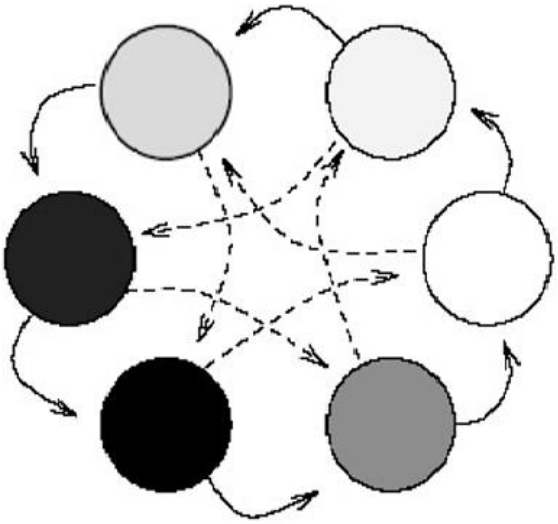

Fig. 2. Island model

In the model migration from each island can occur only at a certain distance, i.e. 2-5 islands depending on the amount of subpopulations. Thus, each island is almost isolated. The number of islands, to which individuals of every subpopulation can migrate, is called isolation distance. It should be noted that mutual migrations are impossible (Fig. 2).

In the island GA model various combinations of the ways of selection and formation of the next generation can be simulated. It also enables the use of different GA operators combinations in different populations.

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UDC 681

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THE DEVELOPMENT OF WELDING COMPLEX FOR ELEMENT DESIGN

Nowadays the problem of increasing the efficiency of production is one of the most important tasks of industrial development. It is becoming of higher priority alongside with the problem of improving the technical level. It is due to the fact, that mechanical engineering and device production are the major industries in Ukraine and the most dynamically developing. The use of integrated automation and robotization is one of the directions to solve this problem according to the rapidly changing market demands, updating and expanding the range of products.

The worldwide use of industrial robots in manufacturing rapidly increased in 2014. The increase composed namely 11% (1.5 million units). At the same time, the level of use of industrial robots in Ukraine was much lower than in other countries. It causes the need for modernization and robotization of production in order to increase its efficiency and competitiveness. Moreover, it determines the urgency of development and introduction the high-performance robotic systems (RS) and robotic lines in manufacture.

Currently the industrial robots are increasingly used to perform not only support loading and unloading functions and transport actions. But they are applied to secondary operations such as preparation and sorting of parts, as well as cleaning surfacesbefore welding or gluing, packaging of finished parts and products, their measurement and etc. The industrial robots are being used at major industrial operations, for example for painting parts and components, connecting them with bolts, welding and others.

The automation of welding allows to increase productivity and product quality by increasing the accuracy of technological operations, reducing the number of support staff and reducing production costs. It will provide competitiveness rise, and rational use of equipment and factory space.

Besides, the use of robotics in welding production allows automating the execution of seams of any shape, as well as a large number of short seams, variously located in space. It can also help to execute the arc welding seams with the horizontal junction line at lower position. It makes possible to use the most productive modes of welding with the formation of seams with minimum geometrical deviation. A worker`s job in these conditions becomes more meaningful and creative, eliminating the operator`s "subjective factor".

The problem implies the robotization of welding production choice between universal and layout of specialized robotic. Therefore, technical and economic tasks related to improving the quality of products and the use of robotics for specific welding industry have to be solved.

Whereas the quality level of robotics increases the new possibilities robot application to manufacture appear for new tasks. The development of specialized

software tools increases the efficiency and level of automation of preparation of control programs (CP) for robots. But usually, the operators of the robots rely on manual step-by-step training, which uses a special remote control. The methods of manual training of robots are time-consuming and inaccurate. Therefore, the current direction is to automate the development of RS for welding of structural elements, and generate a corresponding control program using the appropriate software systems, i.e. the offline programming (OLP).

OLP offers a faster and more convenient way to specify trajectories of the manipulator. This programming can be carried out on the computer at the same time when the robot continues to perform operations in accordance with the previously created UE. Of course, OLP cannot be called a new method. but only now OLP-means functional has become available. This allows you to take an advantage of the much greater precision of modern robotics. Such means have become software packages that provide the ability to generate movements of the manipulator based on the data of CAD / CAM systems.

When designing a welding RS of structural elements, the industrial robot saves necessary to be equippedwith various technological devices - storage of parts and pieces, tore, positioners, transport devices (e.g., roller, belt conveyors), as well as devices, fencing, special gripping devices, etc.

For the development of complex robotic welding of structural elements, it is proposed to use an industrial robot KUKA KR16-2, which is designed for arc welding and brazing, all kinds of manipulation, packing, picking, palletizing, metal industry and processing of plastics, Assembly and disassembly of products, the formation, maintenance and testing of industrial equipment. The uniaxial modular drive unit (positioner) KP1-MD 250 kg payload for fixing and allowing rotation of the welding object is selected. Robot and a positioner are located on the base frame.

The use of SimPro software environment is a universal programming tool for KUKA robots. It helps to modulate the interaction of the industrial robot with RS. SimPro possesses the excellent modeling capabilities, which allow you to program industrial robots outside of the production environment. A characteristic feature of this software is the possibility of simulation. Besides, the interface itself is easy to understand, making the process of preparing the trajectories simpler and more visual. By setting the toolpath within SimPro environment, the robot movements interaction within the robot kinematics are transformed. Thus, it allows to avoid production downtime caused by programming in the workspace. The result of development and simulation of welding operations is shown in Fig. 1.

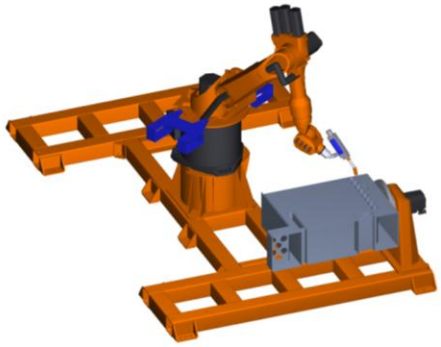

Fig. 1. The example of welding operations modulation using SimPro

UDC 372.891=111

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THE EFFECTS OF COMPUTER TECHNOLOGIES ON HUMAN LIFE

It is currently the 21st century, the age of information technology. A large number of organizations specializing in this or that branch of computer technology appeared, as this is the most urgent and advanced field. As far back as 20-30 years ago humanity could not imagine that the computer would fit in the palm of your hand.

Many countries switched to the so-called “information society", some countries are in the process of transition, depending on the factors that have affected on a particular population. Less and less attention is paid to printed publications: the scientists say that in 30 years, newspapers, magazines, books will disappear from the shelves.

On the one hand, electronic pages are good, less harm is done to the environment, and to store a large amount of information is easier and more convenient in the electronic form. On the other hand, humanity is becoming increasingly dependent on technology. Many people cannot even imagine what they will do if, for example, they forget the phone at home, this will be equal to tragedy. A number of those who simply kill time on social networks is huge, live communication is replaced by a set of letters on the computer, and gestures and facial expressions are shown by emoticons. Yes, it is good for those who are far from each other, or for some other reasons simply physically cannot see each other. But we abuse such benefits, because living in the neighborhood we communicate through the network and devices. People have just stopped visiting and just seeing each other.

We conducted a survey among two groups of Tavria State Agrotechnological University, Melitopol. Our results are presented in Figure 1. On the first diagram we see that in 11CS group students prefer more communication on the Internet. The second senior group communicates the same way in real life and on the Internet. So we can see that the younger generation prefers communication on the Internet.

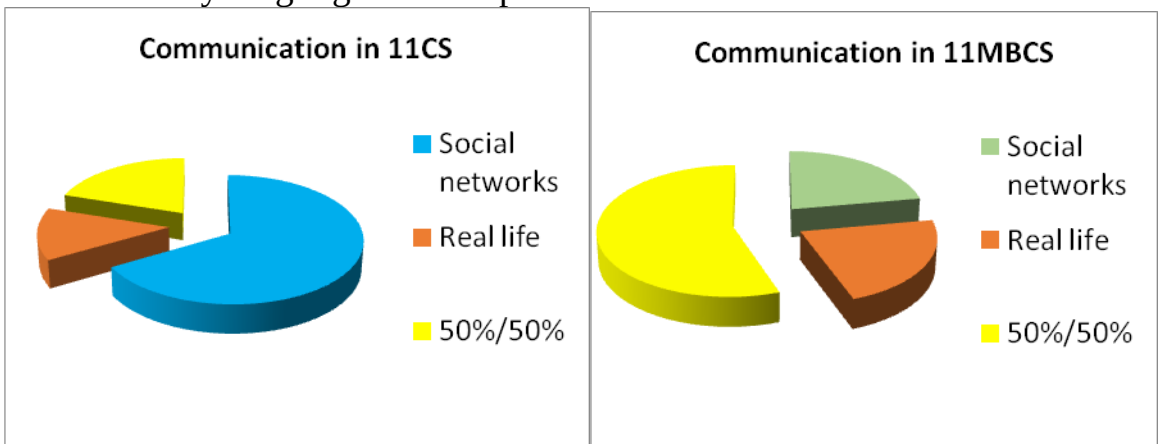

Figure 1. Comparison of communication in 11CS and 11MBCS groups of TSATU

It is worth noting that information technology is firmly entrenched in our lives, and also has made our life easier. You know, how much time and effort it takes to calculate economic processes, since many factors affecting the economy are included, and if one calculated somehow the results of the economic processes of one enterprise, then at the level of one region or the whole country, calculations were made for several days, and accuracy of these calculations left much to be desired. Nowadays, any calculations are performed using computers. The results are accurate, and are calculated in seconds.

In our days programs have been created to help bank workers, economists, accountants, designers. This list can be continued indefinitely and list all professions, as information technology has penetrated in almost all areas of human life. Computer knowledge is the most important requirement for employment.

One of the areas influenced by information technology is education. At schools, electronic pupils' mark books have been started up, with the help of which parents may find out about the progress of their children. At universities and other educational institutions, teachers are increasingly practicing lecturing on electronic media, and also practicing self-study topics. A student can simply send his course or diploma project to the teacher by e-mail, while reducing the time spent on a trip to the place of study, and the time of the teacher: he can check the project at convenient time and send it to the student with instructions for finalizing. Also the importance of distance learning should be noted. People with disabilities have a chance to get an education, to develop mentally.

Also, information technologies strongly influenced the quality of investigations of crimes of all kinds, from minor violations on the roads to serious crimes related to the death of people. There are all kinds of lie detectors, programs that can identify the location of a person, allowing to conduct many types of examinations, so reducing the percentage of errors in investigations.

The percentage of errors has decreased both in investigations and in medicine. This is another area where a big breakthrough and a forward leap has been made thanks to information technology. Doctors began to carry out surgeries on vital organs: today people are recovered from diseases that considered to be fatal ones.

To summarise the main points of our paper, we should remind you, how much we depend on the computer, we define ourselves. The person himself determines what to spend time on and how to live his life.

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FRONT-END WEB DEVELOPMENT

Front-end web development, also known as client-side development is the practice of producing HTML, CSS and JavaScript for a website or Web Application so that a user can see and interact with them directly. The challenge associated with front end development is that the tools and techniques used to create the front end of a website change constantly and so the developer needs to constantly be aware of how the field is developing.

The objective of designing a site is to ensure that when the users open up the site they see the information in a format that is easy to read and relevant. This is further complicated by the fact that users now use a large variety of devices with varying screen sizes and resolutions thus forcing the designer to take into consideration these aspects when designing the site. They need to ensure that their site comes up correctly in different browsers (cross-browser), different operating systems (cross-platform) and different devices (cross-device), which requires careful planning on the side of the developer.

There are several tools available that can be used to develop the front end of a website, and understanding which tools are best fit for specific tasks marks the difference between developing a hacked site and a well designed, scalable site.

HyperText Markup language (HTML)

Hyper Text Markup Language is the backbone of any website development process, without which a web page doesn't exist. It is the HTML code that provides an overall framework of how the site will look. HTML was developed by Tim Berners-Lee. After the development of the HTML there are many versions which came in the market of World Wide Web. The latest version of HTML is called HTML5 and was published on October 28, 2014 by the W3 recommendation. This version contains new and efficient ways of handling elements such as video and audio files. HTML5 is now very popular among front-end web developers. The HTML5 has lots of features in comparison to the older versions. After the development of HTML, a revolution came in the field of internet. Now, world started communicating by using the single language i.e.: HTML. The term HTML is made up of two parts. The first one is Hyper Text and the second one is Markup Language.

Style

CSS, cascading style sheets, a core functionality of front-end development, the styles that lay out the page and give it both its unique visual flair and a clear, user-friendly view to allow readers, who never linger on pages we would like to think they do, some help to read or skim the contents quickly.

Design means both how something looks and how something is structured, and in a good design, both come together.

An important aspect of styling is checking across several browsers and to write concise, terse code that is specific yet generic at the same time and displays well in as many renderers as possible, which leads me to the next point.

Programming

Although by this I mean mostly Javascript, this could apply to ActionScript, PHP or any other popular web languages developped for the front-end. Javascript has fully grown up from inline commands embedded in html to full-blown asynchronous applications executed on the fly on the browser as unobtrusive rich functionality.

The widespread usage of js libraries such as jQuery or MooTools has produced a plethora, some would even say an excess, of visual effects that turn web pages into a more three-dimensional immersive experience. A notoriously untyped language with a bad reputation that baffles programmers and scares scripters, javascript was developed specifically for the Web and, like it or not, it is here to stay.

Usability

Information architecture has blossomed in the past few years but as the people who build the site interact with the clients, the graphic designers, the backend developers and product managers, front-end last-stop position should mean flagging up details, suggesting improvements as well as taking part in usability testing.

Depending on the size of the team and allocated budget, sometimes a front-end developer is both designer, QA of the backend bugs, usability and accessibility tester and ia, which isn't an enviable position. A front-end developer probably looks at more websites and evaluates how they look and work more than other team members as a translator is more naturally interested in words and grammar than other people.

Performance

To build even faster sites, your markup, styles and javascript should be both scalable and nimble. A growing discipline, with the foreseeable rising costs of energy in the years to come and the problems caused by scaling performance in rich content sites with customised content (the web 2.0 meme), it is in the best interest for companies to reduce their page size footprint as much as possible to avoid rising bandwidth costs.

At the same time, the shift from desktop to online rich applications means that a heavier load on the browser should be alleviated with page reductions elsewhere and constant monitoring of new features.

Cross-browser, cross-platform, cross-device functionality

The browser on your computer is to remain the most advanced and feature-rich client application to access the web for a long time, but that doesn't mean that 'snacking' with mobile browsing, or netbooks, etc, isn't a rapidly growing in presence and importance.

Since the browser wars between Netscape and Internet Explorer on PCs, much has happened. Nowadays, browsers compete with each other for page-rendering speed, plug-ins and add-ons to achieve both a lean and comprehensive browser experience. As applications move to the cloud, gmail being a popular example, the browser becomes the OS, which puts further emphasis on coding, styling and

programming for as many clients as possible. As Douglas Crockford said Browsers are the most hostile software development environment imaginable.

UX designer (user experience designer)

UX designers are primarily concerned with **how the product feels**. A given design problem has no single right answer. UX designers explore many different approaches to solving a specific user problem. The broad responsibility of a UX designer is to ensure that the product logically flows from one step to the next. One way that a UX designer might do this is by conducting in-person user tests to observe one's behavior. By identifying verbal and non-verbal stumbling blocks, they refine and iterate to create the "best" user experience. An example project is creating a delightful onboarding flow for a new user.

UI designer (user interface designer)

Unlike UX designers who are concerned with the overall feel of the product, user interface designers are particular about **how the product is laid out**. They are in charge of designing each screen or page with which a user interacts and ensuring that the UI visually communicates the path that a UX designer has laid out. For example, a UI designer creating an analytics dashboard might front load the most important content at the top, or decide whether a slider or a control knob makes the most intuitive sense to adjust a graph. UI designers are also typically responsible for creating a cohesive style guide and ensuring that a consistent design language is applied across the product. Maintaining consistency in visual elements and defining behavior such as how to display error or warning states fall under the purview of a UI designer.

In conclusion

Thucydides wrote 'Knowledge without understanding is useless'. Since its inception, the web has been primarily about information but this data-driven trend can just drown people with a flood of disconnected, random info factoids that few can grasp and even fewer be interested in.

The goal of a front end developer is to create clear, easy, fast pages and interfaces that will make people understand and care about the information, by putting it in context, expose its legitimacy or lack thereof, and reveal their implicit or explicit interconnection.

Front-end is not just a pretty face, it's the friendly, forward-looking interface of web development.

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THE ROLE OF INFORMATION TECHNOLOGY IN MUSIC MAKING

Have you ever wondered what would be modern music without the participation of computer technologies in its creation? The influence of new technologies on music can be traced from ancient times. Music developed along with the development of means of its execution, that is, musical instruments. It is impossible to imagine, for example, Mozart's 40th symphony, played, say, on a branch sticking out of a stump.

In the last decade, any musician has a powerful assistant – a computer. With the invention of sound cards for a computer, it became possible to insert chips on them with a tool bank from any modern synthesizer. With the help of special sequence programs in the computer, you can "insert" any melody, play and mix it. Not so long ago software samplers appeared that allowed you to record a sample of sound, indicate which note it corresponds to and, connecting to the synthesizer, play this timbre. It used to take a long time to study in music schools, and now you can compose only with a computer, knowing a little musical literacy and not knowing how to play anything.

The process of sound recording has gone a long way. Musical notation is technically simple, and therefore the most ancient way. No tools, except a pen with ink and a piece of parchment, and then paper for it was not required. However, in the process of the formation of music as art, there was a need for a more perfect method of sound recording than notes. After all, not everyone who loved music knew how to play something. They just invented the first device, which allowed to reproduce music, not knowing how to play anything. It was a barrel organ. And at the end of the nineteenth century, Thomas Edison invented a phonograph. This invention is considered to be a turning point in the history of sound recording. Then, over the course of many years, the improvement of the wave technique of sound recording progressed, in proportion to the technological progress of mankind. Approximately in the mid-1970s a new generation of musical instruments appeared: microprocessors - basically they were all sorts of different synthesizers, and later computers. Currently, every person who has got a computer, sound card and microphone, has the ability to record any instruments and vocals without leaving home.

Due to the intensive development of computer technologies, there is the possibility of distance musical education. Hence, first of all, the history and theory of music, but, in part, and practical advice, are already available in any geographical point remote from respectable educational institutions. The computer today is already ready to offer much of what will finally allow us to realize the historically and socially-ripe slogan "Music is for everyone!".

The availability of computer technology and the convenience of software create unprecedented scale for music creativity. Expressions "my music", "my home studio", "my CDs", "my video clips", "my music site" (everywhere "my" - meaning "created by me") already become familiar mass concepts. Today everyone can try himself as a composer, an arranger, a sound engineer, a composer of new timbres and sound effects.

Against the backdrop of such a massive enthusiasm, the prestige and quality of music education is multiplying, the content of which changes significantly due to the computer, becomes more high-tech and intensive, flexibly customizable for any specific tasks. Every music teacher will be able to master the music and computer technologies in the near future.

Musical-computer technologies increasingly replace the labor-intensive musical professions, because of which, under the compulsion of parents, for the time being, not too often assiduous boys and girls are deprived for 10-15 years of their children's happiness. The joy of instant direct music making will bring them even more ingeniously designed synthesizers and music computers. And virtuosi (violinists, pianists, clarinetists, trumpeters), as before, will become only truly talented, enthusiastic and patient musicians.

A survey was conducted among musicians to find out what modern musical digital tools are most often used. Below there is a graph of results of research (Figure 1):

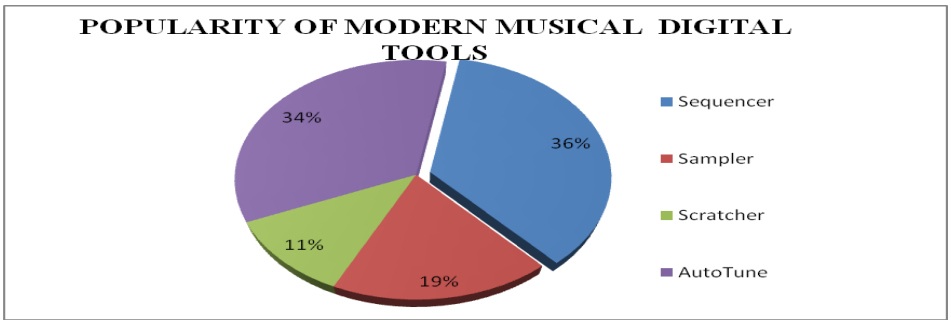

Figure 1.Popularity of modern musical digital tools

Each musician chooses the necessary tools depending on the tasks that it should perform (for some tasks it may be necessary to use several of the utilities provided). We see that most musicians work primarily with sequencers.

In conclusion, it should be noted computer technology is growing incredibly. Work with a computer is becoming more convenient and comfortable. However, do not forget that music is a great art and it is created by people, whereas computers only help to implement it.

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UDC 681

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THE SYSTEM CONTROL OF ACCESS BASED ON RADIO FREQUENCY IDENTIFICATION

The aim of this study is to find more convenient way for accounting and control students, who go to school and to improve the security of participants of educational process applying modern technology.

1. Abstract:

The problem of safety and security is a priority of the existence of any state. It is directly related to different spheres of any person's life, including the national education system.

Despite the fact that the protection of schools, kindergartens and universities is an important and necessary task, nobody undertakes centralized solution to this serious issue at the state level. That is why, the educational institutions (schools, kindergartens and universities), together with parent committees are f ocused on solution the problem of strengthening the protection of the institution.

Most schools just do not have the capacity to improve the safety of students and the staff. Thus, in the absence of any security systems installed on the territory of schools, the number of dangerous and emergency situations, criminal events, cases of child morbidity, injuries and even deaths cause huge problems.

Children are the most important object for both - the state and society, so the task of the project is to develop a user-friendly and affordable security system of educational institutions using contactless radio frequency identification (Rfid).

2. Introduction to RFID Technology

RFID (Radio Frequency Identification- is a method of automatic identification of objects, that uses radio signals to read or write data from transponders or RFID-tags.

Any RFID-system includes a reader (or interrohator) and a transponder (also RFID-label, sometimes uses the term RFID-tag).

The reader – is a device, that reads the information from RFid-tag. These devices can be constantly connected to the accounting system or operate independently.

RFid-Tag or transponder is a device that receives and sends some data from and to a reader by radio frequency signal.

The classification of RFID-tags is as following:

- The operating frequency
- The power supply (active, passive, half passive)
- The type of memory (rewritable, Write-Once)

• The developing (materials and forms of production)

RFID-systems use four frequency ranges: 125-150 kHz, 13.56 MHz, 862-950 MHz and GHz 2,4-5.

More common frequency range is 13.56 MHz, because it is cheaper and more user-friendly.

3. The access system control

The system control of access(SCA) is a set of hardware and software technical security measures that are intended to limit registration and log-out objects (people, vehicles) in a given area through the "point of passage": doors, gate checkpoint.

The main task is to control the access to the given area (when, at what time and on what territory), including also:

• access restrictions to the given territory

• identification of the person who has access to the given territory

The dditional tasks are:

• time tracking;

• maintaining staff / visitors database;

4. The conclusion:

The full operation system includes the PC, RFID-reader and RFID-tags.

The advantages of the developed monitoring system are:

1. Resource availability.
2. Low cost.
3. Easy to install, to use and to service.

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APPROACHES TO SOCIAL NETWORK ANALYSIS

Social network analysis is an interdisciplinary practice at the interface of different science, particularly social science, network analysis, graph theory, artificial intelligence, information search, and marketing. Network analysis solves problems of a network. Its structure can be explained by graph theory. Graph theory is a set of abstract concepts and methods for graph analyzing. The composition of these fields alongside with the analytical methods and other methods, which are developed for analyzing and viewing results of social network analysis, are the base of social analysis methods in general.

The study of society from the point of view of the study of an individual, who is involved in the network relations, allows finding logical explanations of people behavior, identifying the patterns, which cannot be detected by only one-person research. Thanks to the development of computing devices and modern technologies for the analysis of society and its phenomena it has become possible to find new prospects and opportunities. A lot of issues, which were impossible to be solved before, are now available to research.

The network analysis is used outside society science as well. The methods of network analysis have made it possible to examine the internet traffic, the information dissemination. For example, the network analysis is used for enhancing information flow in business; the law-enforcement agencies use it to detect the terrorist networks, social networks can be recommended to the potential friends and so on.

Let us take a look at the analysis of social networks, such as Facebook, Twitter, LinkedIn, Google+, GitHub etc. There are many problems to be solved at the analysis of the social networks data. They are :

1. Personal Data Privacy.
2. Access limit and number of requests.
3. The need to structure data.

Concerning the social network analysis directions the following can be highlighted:

1. Text mining analysis.
2. User identification in the different networks.
3. Content, goods and services recommendation.
4. Predicting user’ behavior.
5. Searching user’s friends list and groups.

6. The establishment of the hidden attributes.
7. Identifying fake threatening society accounts.

Social neworks are classified into two types: sociocentric (whole) and egocentric (personal). Sociocentric media are the connections of all the elements in the closed population, which are focused on addressing the large group of humans, while egocentric media consider individuals.

The topicality of the given project is the identification of the social networking user's behavior patterns, predicting behavior by the Data Mining methods. A new hypotheses on the user's and group's behavior is also proposed. The system should be based on the mathematical models by means of Data Mining and it has to be able to handle bigger data. The problems of collecting information, the data receiving models, using methods to establish the links and the patterns within big data, which is received from social networks; designing the algorithms to respond to new challenges require further research. The information is becoming more accessible and understandable via the visual tools. It is important to design the algorithms, which can combine not only analysis methods, but also illustrate the information and enhance our understanding of the network structure and dynamics.

Let us look at the main metrics of social network analysis.

Density is the proportion of direct ties in a network relative to the total number possible. This dimension is often used to compare the same size graphs.

Clustering coefficient is some estimation of the network fragmentation. For example, it is the probability that two of my friends are friends to each other.

Closeness is dimensions, which show the speed of information transmission from one node to the other, relating to it.

Bridge provides the only link between two individuals or clusters.

Centrality is subtraction between the number of links for every node, divided into the maximum possible sum of subtraction.

UDC 681

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AUTOMATED CONTROL SYSTEM OF WALLPAPER QUALIY FOR VIDEO

Nowadays every human life is difficult to imagine without automation. It is one of the main and most advanced areas of modern technology. Automation is used

effectively for the conservation of resources, environmental improvement, qualitative and reliable products.

The effects caused by the introduction of automation are to reduce complexity of production and labor costs, to increase production variability, to achieve stable speed, analysis, monitoring and control based on mathematical the methods and use of computers as well as possibility of performing operations within harmful environment.

Wallpapers have become a traditional feature of a modern house. They always create comfort, giving the tone and mood to some interior. The quality control starts with the assessment of wallpaper integrity canvas, surface condition, matching the figure, the absence of stains or other deformations. Wallpaper surfaces must be dry, clean, have integrity and meet the figure.

The topicality of the given work is the necessary to modernize and automate the quality control line for wallpapers. Wallpaper control process is divided into four stages:

1. Visual inspection of the product.
2. Determination of integrity and the lack of any damage (registration).
3. Matching the figure (recognition).
4. If the product does not match the requirements, it is considered to be defective.

A video camera is used to provide the visual inspection of a product (wallpaper) inspection. It allows to automatically performing the basic technological operation registration and further recognition of wallpaper.

The program performs both registration and recognition. The program has already been installed in the same video camera, or it can be controlled by the computer. The rejection itself is done by the performing mechanism which sends the signal from the computer (programmed camera).

Therefore, it is recommended to create the recognition algorithm for an image and implement it on a high level programming language. The research has allowed making the conclusion that the correlation coefficient decreases uniformly compared to the samples of location coordinates.

According to the research we can also conclude, that using Pearson's correlation coefficient K makes possible to establish linear connection between pixels. Therefore, the similarity degree of two images can be estimated by the correlation coefficient value.

UDC 681

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ROBOTICCOMPLEX MODELING OF THE PASTRY PRODUCT PALLETIZING

Today, industrial robots are widely used in service of technologicalprocesses and automation of transport operations. The use of industrial robots in modern technological processes allows to realize complete automation, to simplify the production process, to increase the efficiency of the workforce, ensure the quality of work and to reduce the financial expenses on work payment. In general, robots are used for such operations as welding, painting, assembling, selection, and installation, packaging, product inspection and testing.

An industrial robot is a device which consisting of a mechanical manipulator and a programmable control system, that is used to move objects in space the various manufacturing processes. Industrial robots are important components of automated flexible manufacturing systems. This systems allow to increase work productivity.

The use of industrial robots can be divided into automatic execution of processes for welding, assembling, painting, coating, soldering, performing of the control operations, packaging, transportation and automation of the machining processes (service of various cutting, plangent and abrasive machine tools), presses of cold and hot stamping, forging and foundry equipment, installations for heat treatment and loading/unloading of semiautomatic devices of second welding and contact welding machines, automation of assembly operations. The main idea of a robotic technological complex is that the industrial robot has to be used in combination with specificprocess technological equipment.

The purpose of this work is to apply software products to modelling, programming and visualization of robotic complex of the of pastry productspalletizing.

Software product RoboDK allows to perform the following tasks:

1. To model and to program industrial robots offline.
2. To optimize the path of the industrial robot automatically avoiding collisions with objects.
3. To calibrate industrial robots in order improve their accuracy and efficiency.
4. To export the developed program to the control system of an industrial robot.

RoboDK software product will be used for the development of robotic complex of the pastry productspalletizing, and programming of an industrial robot. RoboDK allows to visualize the process of palletizing, and simulate work of the robot. The dimensions of the boxes for palletizing, the number of boxes on the pallet and speed to assembly line (Fig.1). Have to be specify in the developed program code to control the industrial robot smooth and uninterrupted operation.

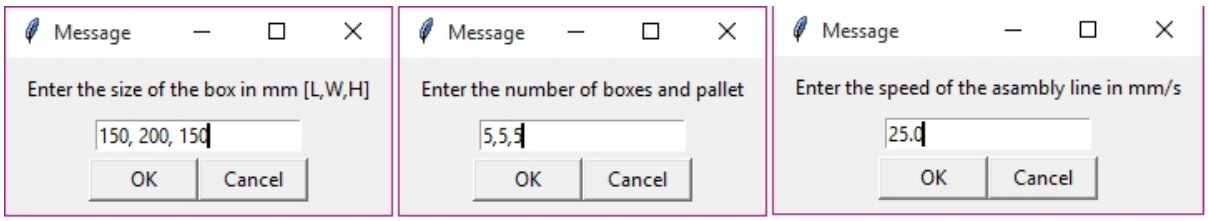

Fig. 1. Forms of specifying parameters for the palletizing process

The principle of the robotic complex is the followingoperation: boxes with pastry products are transferredto the industrial robot, whichit has the trays on both sides. After a box has reached the final point on the assembly line, the sensor sends a signal to permit industrial robot to transfer boxes on the pallet. The cycle repeats until the tray does not reach the specified number of boxes by operator. After filling the pallet, industrial robot moves to start place the boxes on each other at another pallet. At the same time filled pallet is transported to the storehouse, and the new pallet is supplied.

As a result, the developed robotic complex of the palletizing of pastry products will increase the speed of the box palletizing on the pallet, win ensure more steady placement of boxes on the pallet, which will increase the security level in the warehouse and makes it easier to load the assembly line.

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ARTIFICIAL INTELLIGENCE: EXPECTATIONS AND RISKS

Artificial Intelligence (AI) is one of the most popular but contradictive subjects in Computer Science. From computer vision to game playing, it has made a lot of progress in the past few years. Big and influential companies all over the world have already placed huge bets on this technology, and over the next decade AI is expected to gain all possible spheres of human life. AI ranges from machines truly capable of thinking to search algorithms used to play board games. It has applications in nearly every way we use computers in society.

It takes its roots from the study of non-learning artificial neural networks in the researches of Walter Pitts and Warren McCullouch. One more pioneer was Frank Rosenblatt who developed and extended the idea of perceptron, a learning network with a single layer, similar to the old concept of linear regression [3]. Neural networks were applied to the problem of intelligent control (for robotics) or learning, using such techniques as Hebbian learning, GMDH or competitive learning. Later, Alan Turing wrote a paper on the notion of machines being able to simulate human beings and the ability to do intelligent things, such as play chess. The main achievements over the past sixty years have been advances in search algorithms,

machine learning algorithms, and integrating statistical analysis into understanding the world at large.

In computer science, the field of AI research defines itself as the study of "intelligent agents": any device that perceives its environment and takes actions that maximize its chance of success at some goal [4].

Scientists are now debating the implications of AI, a fast-moving technology that enables machines to perform tasks that could previously be done only by humans. In the near term, the goal of keeping AI's impact on society beneficial motivates research in many areas, from economics and law to technical topics such as verification, validity, security and control. It becomes very convenient that an AI system does what you want it to do if it controls your car, your airplane, your pacemaker, your automated trading system or your power grid. The potential benefits are huge as everything that civilization has to offer is a product of human intelligence. It's difficult to predict what we might achieve when this intelligence is magnified by the tools that AI may provide.

In the long term, an important question is what will happen if one day an AI system becomes better than humans at all cognitive tasks. As Irving Good realized in 1965, designing smarter AI systems is itself a cognitive task. Such a system could potentially undergo recursive self-improvement, triggering an intelligence explosion leaving human intellect far behind. It raises up one more concern whether we will be able to align the goals of the AI with ours before it becomes super intelligent and control it.

There are some who question whether strong AI will ever be achieved, and others who insist that the creation of super intelligent AI is guaranteed to be beneficial. In my opinion people should be aware of both of these possibilities and direct all their efforts to prevent such potentially negative consequences in the future, thus enjoying the benefits of AI.

Thus, most experts [2] attract our attention to these most possible scenarios:

1) The AI is programmed to do something devastating. Autonomous weapons are artificial intelligence systems that are programmed to kill. In the hands of the wrong person, these weapons could easily cause mass casualties. Moreover, an AI arms race could inadvertently lead to an AI war that also results in mass casualties. To avoid being thwarted by the enemy, these weapons would be designed to be extremely difficult to simply "turn off," so humans could plausibly lose control of such a situation. This risk is one that's present even with narrow AI, but grows as levels of AI intelligence and autonomy increase.

2) The AI is programmed to do something beneficial, but it develops a destructive method for achieving its goal. This can happen whenever we fail to fully align the AI's goals with ours, which is strikingly difficult. If you ask an obedient intelligent car to take you to the airport as fast as possible, it might get you there chased by helicopters, doing not what you wanted but literally what you asked for. If a super intelligent system is tasked with an ambitious project, it might wreak havoc with our ecosystem as a side effect, and view human attempts to stop it as a threat to be met.

As these examples illustrate, the concern about advanced AI isn't malevolence but competence. A super-intelligent AI will be extremely good at accomplishing its goals, and if those goals aren't aligned with ours, humanity will get in trouble.

To sum up, it is believed that AI won't stop its development due to all advantages it can offer for people. It means that in a few years we will get independent thinking machines and will have to distinguish the ways of cooperating with them. These powerful mechanisms require control and people's oversight. Thus, it's up to us to determine our future.

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THREE TYPES OF ARTIFICIAL INTELLIGENCE

"Rapid development of human scientific activity is one of modern trends. Every day new technologies rush into in our life. Artificial intelligence (AI) is not just an important topic, but by far the most important aspect of our future," says Tim Urban, the founder of the popular Web site "Wait but why", which explains different topics, including AI. Nevertheless, AI is not a recent invention. The first level of AI development is gradually appearing in technologies we use every day. With every coming year these advancements will accelerate and the technology will become more complex, addictive, and ubiquitous. Progress will lead us to creating a new level of AI – Artificial Super Intelligence (ASI), which will surpass capabilities of human intellect.

Ray Kurzweil, a computer scientist, inventor and futurist, suggests that the progress of the entire 20th century would have been achieved in only 20 years at the rate of advancement in the year 2000 – in other words, by 2000, the rate of progress was five times faster than the average rate of progress during the 20th century. He believes another 20th century's worth of progress happened between 2000 and 2014 and that another 20th century's worth of progress will happen by 2021, in only few years. A couple decades later, he believes, a 20th century's worth of progress will

happen multiple times in the same year, and later, in less than one month. All in all, because of the Law of Accelerating Returns, Kurzweil believes that the 21st century will achieve 1,000 times the progress of the 20th century [1, p. 281].

A typical dystopian futurist movie has one or two individuals or groups fighting for control of the AI. Or we see the AI battling the humans for world domination. But this is not how AI is being integrated into the world today. AI is not in one or two hands, it's in 1 billion or 2 billion hands. A kid in Africa with a smartphone has more intelligent access to knowledge than the President of the United States had 20 years ago. As AI continues to get smarter, its use will only grow. Virtually everyone's mental capabilities will be enhanced by it within a decade [2].

There are three levels of artificial intelligence: ANI, AGI and ASI.

ANI (Artificial Narrow Intelligence) – is the first level that can make a decade only in one sphere. For example, there's AI that can beat the world chess champion in chess, but that's the only thing it does.

AGI (Artificial General Intelligence) – AI that reaches and then passes the intelligence level of a human, meaning it has the ability to 'reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly, and learn from experience [3, p.13].

ASI (Artificial Super Intelligence) – an intellect that is much smarter than the best human brain in practically every field, including scientific creativity, general wisdom and social skills [4, p.1].

Humans have conquered the lowest caliber of AI-ANI – in many ways, and it's everywhere:

- Cars are full of ANI systems, from the computer that figures out when the anti-lock brakes kick in to the computer that tunes the parameters of the fuel injection systems.

- Google search is also one large ANI brain with incredibly sophisticated methods for ranking pages and figuring out what to show you in particular. The same goes for Facebook's Newsfeed.

- Email spam filters are equipped with intelligence about how to identify what's spam and what's not, and then it learns and tailors its intelligence to your particular preferences.

- Passenger planes are flown almost entirely by ANI, without the help of humans.

Sophisticated ANI systems are widely used in sectors and industries like military, manufacturing, and finance (algorithmic high-frequency AI traders account for more than half of equity shares traded on US markets) [5].

Artificial General Intelligence (AGI) is an emerging field aimed at development of 'thinking machines'; that is, general-purpose systems with intelligence comparable to that of human mind (and perhaps ultimately well beyond human general intelligence). While this was the original goal of Artificial Intelligence (AI), the mainstream of AI research has turned toward domain-

dependent and problem-specific solutions; therefore it has become necessary to use a new name.

People can easily build a computer that can multiply ten-digit numbers in a split second or beat any human in chess. But building one that can look at a dog and answer whether it's a dog or a cat is an incredible difficult task. Why doing complex mathematical operations is easier, than just looking and recognizing an object for computer? Everyone with eyes can recognize everything he or she sees, but it's so hard for human to calculate root of 2587. Well, we can set the machine to perform the same algorithm, but make computer work, like human brain is really hard. Actually, we don't know exactly how our brain works! Hard process of its work formed during years of evolution, even thousands or millions years of evolution. Calculating or building mathematical forecasts is relatively new to humans in terms of biology, so it is harder for us, than analyse what we see.

"When you reach your hand up toward an object, the muscles, tendons, and bones in your shoulder, elbow, and wrist instantly perform a long series of physical operations, in conjunction with your eyes, to allow you to move your hand in a straight line through three dimensions. It seems effortless to you because you have perfected software in your brain for doing it."[6].

The main problem is creating hardware, which can simulate 100% of the human brain. If an AI system is going to be as intelligent as the brain, it'll need to equal the brain's raw computing capacity.

Ray Kurzweil measured powerful computing capacity. The faster supercomputer in the world is the Chinese Tianhe-2. But it has a very large area, consumes much energy and has a high price. So powerful isn't a problem, problem is cost. Next is that scientist want to create a computer, which will be able to do coding changes into itself and even improve its own architecture.

At some point, we'll have achieved AGI – computers with human-level of general intelligence. But they will not be equal – the thing is AGI with an identical level of intelligence and computational capacity as a human would still have significant advantages over humans.

- Speed. Even today's usual microprocessors run at 10 million times faster than our neurons.

- Size and storage. Computers can memorize more things in one second than a human can in ten years.

- Reliability and durability. Computer transistors are more accurate than biological neurons, and they're less likely to deteriorate.

- Collective capability. AI isn't biologically constrained to one body, it won't have human cooperation problems, and is able to synchronize and update its own operating system.

Nanotechnology is an idea that comes up "in almost everything you read about the future of AI." But it can be very dangerous in combination with AI. For example, create replication circuits based on Carbon give a possibility to "copy" the most dangerous development very fast. However, positive or negative sides of using

nanotechnologies are something for the future. According to forecasts of Kurzweil technology will become available soon in the 21st century [7].

Today AI helps in medicine, ecology, education. “We have the opportunity in the decades ahead to make major strides in addressing the grand challenges of humanity” [8]. So when will we see the first machine with ASI? The survey results on this matter range from 2022 to 20175 [9, p.9].

“Of course, all of the above statistics are speculative, and they’re only representative of the median opinion of the AI expert community, but it tells us that a large portion of the people who know the most about this topic would agree that 2060 is a very reasonable estimate for the arrival of potentially world-altering ASI. Only 45 years from now” [10].

“Once ASI exists, any human attempt to constrain it will be unreasonable. We would be thinking on human-level, and the ASI would be thinking on ASI-level. In the same way a monkey couldn’t ever figure out how to communicate by phone or wifi and we can, we can’t conceive of all the ways an ASI could achieve its goal or expand its reach. It could, let’s say, shift its “own electrons around in patterns and create all different kinds of outgoing waves”—but that’s just what a human brain can think of – ASI would inevitably come up with something superior [11].

If ASI really does happen this century, and if the outcome of that is really as extreme – and permanent – as most experts think it will be, we have an enormous responsibility on our shoulders. The next million+ years of human lives are all quietly looking at us, hoping as hard as they can hope that we don’t mess this up. So with new technologies we can give a chance for a better life, or we can bring all humanity to the unhappy end.

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TURING MACHINE AS AN INTEGRAL PART IN FORMATION AND DEVELOPMENT OF PROGRAMMING LANGUAGES

In the article a Turing machine, the theoretical basis for algorithms and scientific base of programming is presented. Special attention is paid to study of Turing machine algorithms, the essence of the algorithm and its influence on the development of information technology. The importance of knowledge on a Turing machine for future programmers is emphasized.

Modern development of information technology and computers are considered to be completely different from the mechanism of a Turing machine, but this invention became the theoretical basis for algorithms and scientific base of programming and it influenced the formation of high-level languages.

A Turing machine became a great invention that marked the beginning of the era of information technology and predicted the architecture of modern computer systems. It was named after the British mathematician Alan Turing, the great English mathematician, the founder of computer science, who proposed the concept in 1936. The genius invention of Alan Turing was successfully applied by British Analytical Crypto Office during World War II to break German secret codes [3].

A Turing machine is an abstract machine that manipulates symbols on a strip of tape according to a table of rules; to be more exact, it is a mathematical model of computation that defines such a device[3]. In other words, it is the specific sequence of elementary actions to solve a problem. We face such algorithms every day. We

have a certain algorithm for cooking, planting trees, using computers etc. The principle of solving complex mathematical problems by designing various abstract mechanisms and building algorithms formed the basis of the origin of information technology.

Thus, we think this knowledge is really essential for a programmer. Before learning a programming language, a student has to study Turing machine algorithms. A programmer will be able to understand the essence of an algorithm and it will help him to understand a set task easily.

It should be emphasized that any programming language consists of the sequence of steps in forming a certain solution algorithm, that's why Turing machine is not very good for programming because of lack of instruction set basic arithmetic operations [2, c.102].

The significance of Alan Turing and his invention for mankind are irreplaceable. In 1982, scientists at the University of Toronto created more powerful programming language than Pascal and they called it Turing. The most famous association ACM (Association for Computing Machinery, established in 1947) introduced the award named after Alan Turing [3].

A Turing machine is very simple, but you can perform virtually any application based on precise algorithms. To perform various computation operations, there is a special table with certain recorded rules representing a set of universal instructions for a machine. Applying this table, which has a fixed procedure for a particular combination of different classes and characters, a device determines which processing operation should be done in each situation [1, c.56]. In fact, the Universal Turing Machine is the first prototype of modern computers.

To sum up, despite the fact that these programming algorithms of a Turing machine are not suitable for computation in practice as it does not use random-access memory, but they help to understand the essence of algorithm sequence of a computer code. We believe that before starting program writing, students have to comprehend the essence of the algorithm to develop the algorithm's logic.

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COMPUTER GRAPHICS

In the 21st century more and more people use this technology in their everyday life. There are very few aspects of our lives which are not affected by computers. In many cases, the same is true about computer graphics. The topic of this paper is highly relevant because everywhere you look nowadays you can find computer graphics – at work, in video games, movies. It is highly applied in the sphere of medical research, different kinds of simulators, weather reports etc. Computer images are all around us. The aim of this paper is to highlight the application of computer graphics from the past until present.

"A picture is worth a thousand words" is a well-known saying which emphasizes the advantages and benefits of the visual presentation of our data.

Computer graphics are any types of images created with a help of computer. There is a vast amount of types of images a computer can create. Also, there are just as many ways of creating those images. Images created by computers can be very simple, or extremly complicated.

Scientists claim [1] that computer graphics can be broadly divided into two spheres:

a) Non interactive Computer Graphics;

b) Interactive Computer Graphics.

In Non-interactive computer graphics otherwise known as passive, the observer has no control over the image. Familiar examples of this type of computer graphics include the titles shown on TV and other forms of computer art.

Interactive Computer Graphics involves two ways of communication between a computer and a user. Interactive computer graphics affects our lives in a number of indirect ways. For example, it helps to train the pilots of our airplanes. We can create a flight simulator which may help the pilots to get trained not in a real aircraft but on the ground at the control of the flight simulator.

Nowadays computer graphics has numerous applications, some of which are listed below [3]:

- computer graphics user interfaces (GUIs) − a graphic, mouse-oriented paradigm which allows the user to interact with a computer;
- business presentation graphics;
- cartography − drawing maps;
- weather Maps − real-time mapping, symbolic representations;
- satellite imaging − geodesic images;
- photo enhancement − sharpening blurred photos;
- medical imaging − MRIs, CAT scans, etc. Non-invasive internal examination;

- engineering drawings − mechanical, electrical, civil, etc.
- typography;
- architecture − construction plans, exterior sketches - replacing the blueprints and hand drawings of the past;
- art − computers provide a new medium for artists.
- training − Flight simulators, computer aided instruction, etc.
- entertainment − movies and games.
- simulation and modeling − replacing physical modeling and enactments.

To understand the many issues of today's modern computer graphics, we should trace its development from the early beginning until present.

At first it was first created as a visualization tool for scientists and engineers in government and corporate research centers such as Bell Labs and Boeing in the 1950s. Later the tools would be developed at Universities in the 60s and 70s at places such as Ohio State University, MIT, University of Utah, Cornell, North Carolina and the New York Institute of Technology. In 1980 Turner Whitted published the article about creating realistic images which was the beginning of method of ray tracing. The early breakthroughs that took place in academic centers continued at research centers. These efforts broke first into broadcast video graphics and then major motion pictures. In 1989 the first character was created using 3D graphics in the studio Industrial Light & Magic. In 1993 dinosaurs in Jurassic Park became the first complete and detailed living organisms generated by digital technology [4]. Since then computer graphic researches have been developing in a fast pace all over the world, joined by the research and development departments of entertainment and production companies which are constantly redefining the cutting edge of computer graphic technology in order to present the world with a new synthetic digital reality.

Thus, the beginnings of computer graphics were related to the military industry, due to the very high cost of equipment. The development of new graphics techniques has forced the film industry requires realistic special effects. Currently, computer graphics is used in many areas of our life. It is constantly improving and offers us amazing prospective.

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UDC 004.42

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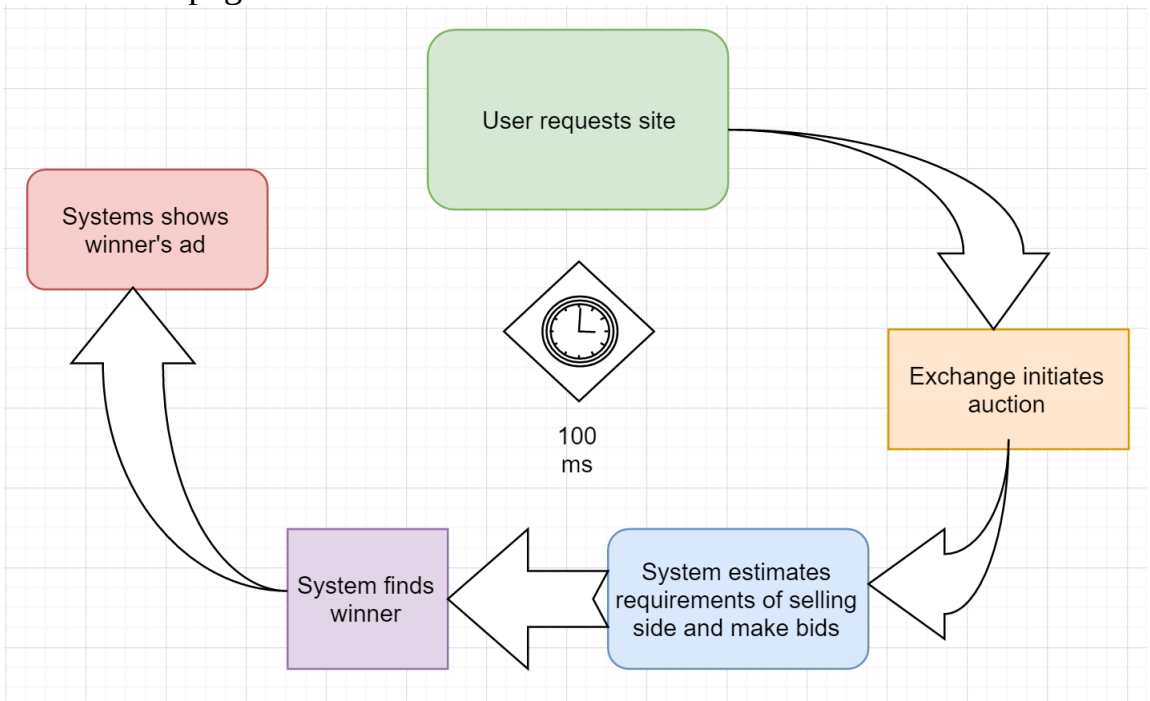
REAL-TIME BIDDING DIGITAL ECOSYSTEM

RTB (Real Time Bidding) is a media ad buying technology, which depends on online auction. RTB protocol defines how an application can estimate and make bids on every broadcast (showing ad to user), at the moment in real-time.

RTB is a marketplace interface, based on buying, which is done programmatically. An ad is shown to target audience, e.g. it is showed depending on every user characteristics. That is why, RTB-systems are mediators, and make possible to show ad to users by their characteristics. The sellers are able to get the customers and increase their profit.

The algorithm has the following steps:

1. A user visits the site, which is a part of RTB-system.
2. The site initiates the request to show the banner before the page is loaded. A user data request can be also initiated.
3. The user data is sent by ad network to SSP.
4. SSP request classification is done by targeting parameters.
5. The bargain is done by SSP and data about a bid is transferred from SSP to trading desk(exchange subsystem)
6. The highest bid is selected.
7. The bid is decreased to the second price.
8. The winner is selected, the ad to is sent to a user's browser.
9. The page is loaded with the banner.



Picture 1

Picture 1 is the general schem of RTB process.

Let us consider the main key concepts for Real Time Bidding.

Ad Exchanges is the ads exchange, programmatic auction with the high level of automation.

SSP (Supply / Sell Side platform) are the special technologies, which make possible to take part in selling ad place, and do it as much expensive as possible.

DSP (Demand Side Platform) are the systems, which operate in parallel with SSP, advertising networks (Ad Networks), advertising exchanges (Ad Exchanges) and perform data exchange for the benefit of an advertiser.

Trading desk is the service, which performs digital media trade.

Ad server is a software, which is used for the direct ad placing on sites (ad zones), transfers banners to publisher's zones, counts the number of ad shows, uses algorithms, can work separately, or with Ad Exchange and act as SSP or DSP or both.

Every of the mentioned systems has data about a user, and can create user data datastore, DMP is Data Management platform, or, if it is needed, some other DMP services can be used.

This system is quite big data store, which should respond immediately to data request based on a user's id. Due to the amount of data is available to use the data mining methods can be applied.

DMP contains the following stages:

1. Data collection which is a collection of all data about a user.
2. Data classification is data separation into classes, taxonomies.
3. Data analysis is getting unexpected dependencies and models.
4. Data circulation is sending data to 3-d party DMP systems, and getting data from them (synchronization process – e.g. data sharing)
5. Scaling makes system to be resistant to huge loads because of big amount of data about users and due to 3-d party DMP connection.

The topicality of the given project is in prognostication, analysis and matching or in ad process processing algorithms creation, and the analysis of the entire system data to foresee behavior and on load work dependencies.

One of the most important characteristics is a user interests analysis in order to increase the matching algorithms efficiency for each view. The network data analysis allows to find factors which make system worse and to give possibility for system users to see these reports graphically in real time, or as close to real time as it is possible.

The given system should be based on modern data analysis methods, operate with big amount of data; give its users possibility to see system metrics for its work analysis, and to increase the efficiency of ad network.

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THREAT ANALYSIS OF COMPUTER FILE-SERVER USING EXPERTS' EVALUATION METHOD

Nowadays, the majority of companies and educational establishments have file-servers at their disposal. The company's success and the confidentiality data provision are affected by the efficiency of these servers. Files of any extension could be stored on them while the access is available for authorized people twenty four hours a day.

File-server is represented by a dedicated server designed for execution of input/output data operations. As a rule, file-server has a big size of disk space, negotiated in form of RAID-array to provide trouble-free and enhanced data reading and writing speed. The advantages are the law cost and short development time, software update and upgrade. The main disadvantage is the low level of the system security.

Thus, 8 highly qualified specialists in information security were selected to evaluate the threat level. While designing the questionnaires they defined what exactly, in their opinion, could cause the biggest damage, namely:

- «Hackers' attacks» are the actions of cyber criminals, which are aimed at information capture from fileserver or gaining control over it or breaking its systems down;
- «Virus upload» are the intentional or unintentional infecting the server with viruses, which are aimed at data destroying;
- «Hardware failures» are the power surge, wear and tear details, loosen hookups, etc;
- «Software failures» is the overload, bugging, software aging, etc;
- «Theft» is server stealing or the whole information stealing remotely or direct copying;
- «Targeted download information» is committed to satisfy a cyber criminal interests or to find information about competitors;
- «Negligence» is a non-execution or unduly execution of server maintenance as a result of careless attitude to work;
- «Sabotage» is a purposeful breakdown of the server operation as a result of careless execution of duties;
- «Accidents» are the war, accidental physical impact on the server, a spilt cup of coffee, natural disasters such as fire, typhoon, flood, earthquake, etc;
- «Purposeful information deleting» is a situation which can occur, for example, at a University in case a competitor has bribed an employee of our University in order not to let other students take part in the competition.

By using the proposed list of threats the experts defined those, which are the most dangerous and the least damage causing. The total expert responses were defined on irregularity by means (the means of Ms Excel spreadsheet). It is possible to find information about threats which are of higher importance using «SUM» and «STDEVIATION» (table1).

Table 2

Computer file-server threat rating

		Threat name	Number of points
1	1	Hackers' attacks	69
2	2	Accidents	62
3	3	Virus upload	60
4	4	Software failures	49
	5	Hardware failures	40
5	6	Theft	30
6	7	Targeted download information	28
	8	Purposeful information deleting	17
7	9	Sabotage	14
8	10	Negligence	9

9	Accidents	62	7,75	0,707106781	0,091239585
10	Purposeful information deleting	17	2,125	0,640869944	0,301585856

According to the calculation results it can be found out the computer file-server threat rating (table 2).

Thus, the experts concluded, that the «Hackers' attacks» could cause the greatest damage and «Negligence» could cause the least one.

The standard deviation, which is defined with the help of «STDEV» function and variability coefficient, is shown in table 1. While, the closer to 0 is the standard deviation value, the smaller is the difference between standard experts' deviation value and the average value. The variability value is less than 0,33 , therefore the variability is small. Therefore, the comparability of the experts' thoughts about the investigated process has to be taken into account.

Let us look at how experts' opinion can be compared. Since we have more than two rated attributes, so to evaluate the experts' concord, the concord coefficient will be used.

Let us use the formula:

$W = \left(\sum_{j=1}^{n} d_j^2\right) / m^2(n^3 - n)$; and $d_j = S_j - \frac{1}{n}\sum_{j=1}^{n} S_j$; number of factors, m is the number of experts, d_j is the deviation sum of the average sum, S_j is the sum of ranks.

We have W = 0,789318. W is closer to 1 coefficient, the bigger is comparability among the experts' thoughts. As usual, the experts' opinions are believed to be agreed if this value is 0,7 or higher. Consequently, the opinions of our experts are in agreement.

Meanwhile, the concord coefficient has been calculated in order to be checked for static significance. So the number of potential risks is more than 7 (we have 10), that is why it is to be checked for static significance applying Pearson criterion $X^2_{розрах}$= 22,1. But the table value is = 14,1 by significance level a $X^2_{табл}$ = 0,05 and degree of freedom.

Thus, according to the results obtained, the concord coefficient is more than 0,7 and the value of Pearson criteria is bigger than in the table one, therefore, experts' opinion is fully agreed.

Now than, with the help of experts' evaluation method, the computer file-server threats are rated and the results are checked. Hacker attacks, accidents, virus upload, software failures, hardware failures, theft, targeted download information, purposeful information deleting, sabotage, negligence are the main threats by their harmful effect.

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ANALYSE DER VERWENDUNGSPERSPEKTIVEN VON COMPUTER-TECHNOLOGIEN IN DER LANDWIRTSCHAFT DER UKRAINE

Landwirtschaft ist ideale Umgebung für Anwendung von Informationstechnologien (IT). Innovationen fördern Steigerung der Produktivität, Einsparung von Ressourcen, Kostenminderung und Steigerung der Effektivität der Produktion. Weltweit ist heute Entwicklung der Landwirtschaft die wichtigste Herausforderung der meisten innovativen technologischen Prozesse. Ihr Ziel ist Produktivität der Agrarproduktion durch Einsatz modernster Technologien. Die intensive Entwicklung der Computer- und Informationstechnologien am Anfang des neuen Jahrtausends beschleunigte drastisch die Prozesse der Globalisierung und führte zu tiefen Veränderungen in verschiedenen Bereichen der Landwirtschaft. Computertechnologien gelten seit langem als ein großes Potenzial der Wissenschaftszweige, die dazu dienen, den Entwicklungsprozess in der Agrarproduktion des Landes zu verbessern.

Die Analyse der vorigen Forschungen zeigt, dass Entwicklung der innovativen Tätigkeit im Agrarbereich unseres Landes schwach ist. Der Grund dazu ist die Krise, die vom Rückgang der Absatzmärkte, von Knappheit der Finanzierungsquellen und vom Mangel moderner Produktions- und Anbautechnologien in der Landwirtschaft verursacht wurde [1].

Ziel der Informatisierung des Agrarsektors in der gegenwärtigen Phase ist die Schaffung von Bedingungen für schnelle Verbreitung landwirtschaftlichen Wissens und der Informationen fürs Treffen der optimalen Entscheidungen des Managements, die das wirksame Funktionieren des Marktes und der Finanz- und Kreditmechanismen, Unterstützung der interdisziplinären Beziehungen und die Integration des Agrarproduktion der Ukraine in das Weltwirtschaftssystem sichern.

Im Rahmen dieses Aspektes gewinnt die außerordentliche Relevanz aktive Suche nach solchen innovativen Lösungen, die sicherstellen, dass die Erhöhung der Effektivität des Funktionierens des Agrarsektors unter Bedingungen der Beschränktheit und der Erschöpfung der natürlichen Ressourcen steigt. Heutzutage

ist die kontinuierliche Umsetzung der neuesten Erarbeitungen der Schlüssel zur nachhaltigen Entwicklung der Landwirtschaft.

Das Ziel der angebotenen Studie ist die allseitige Bewertung der Probleme und Perspektiven der Verwendung der neuesten fortschrittlichen Technologien in der Landwirtschaft in der aktuellen Wirtschaftslage in der Ukraine. Gegenstand der Forschung sind Prozesse der Einführung und effektiver Einsatz von modernen innovativen Agrartechnologien in der Ukraine. Als Objekt der Forschung werden innovative Technologien im landwirtschaftlichen Bereich betrachtet [1].

Moderner Zustand des Agrarsektors in aller Welt wird durch Einfluss der Modernisierung bedingt. Die Ukraine muss Besonderheiten der Produktion und Notwendigkeit der Einführung von innovativen Technologien berücksichtigen. Die Landwirtschaft der Ukraine versucht, moderne wissenschaftliche und technische Entwicklungsarbeiten zu übernehmen. Ein Beweis dafür ist Verwendung neuester Technologien in Pflanzenzucht und Tierhaltung z. B.: „Mriya Agro Holding“, Holding „KernelGroup“ und andere große Unternehmen verwenden schon heute innovative Lösungen.

Die erste Stelle unter solchen Technologien belegen Innovationen für Bodenbearbeitung. Sie werden aktiv in ukrainischer Landwirtschaft zur Verbesserung der Fruchtbarkeit des Bodens und Erhaltung von Spurenelementen verwendet, aber ihre Auswirkungen haben nicht immer positiven Effekt. Dies spiegelt sich in Verschmutzung des Grundwassers und Zerstörung der Nährstoffe von Mikroorganismen wider. Deshalb werden progressive Technologien der minimalen Bodenbearbeitung und Präzisionsackerbaus benutzt, z. B. [1]:

1. ***„Mini-till“*** sieht Minimierung technologischer Auswirkungen auf Boden während Behandlung vor. Dies erhöht Wirtschaftlichkeit und Umweltverträglichkeit der Anbau durch Verringerung der Kosten für Kraftstoffe, Dünger, Pflanzenschutzmittel, durch Anstieg der Produktivität als auch durch Verbesserung des Zustandes natürlicher Umwelt.

Vorteile von *„Mini-till“*-Anwendung sind:

- die Ansammlung von organischen Stoffen;
- Verbesserung der Bodeneigenschaften;
- Reduzierung der Kosten für Düngemittel;
- die Erhaltung der Feuchtigkeit im Boden;

Nachteile sind aber auch vorhanden:

- die hohen Kosten für Ausrüstung;
- Notwendigkeit des Erwerbs der neuen Technik.

2. ***„No-till“ oder „Zero-till“.*** Diese Methode der Bodenbearbeitung bietet nichtmechanische Wirkung zur Dichtungsbehebung in der Tiefe von 30-35 cm an. Es ist ideales System der Bodenbearbeitung zum Schutz der Oberfläche vor Erosion.

Vorteile ihrer Anwendung sind:

- der Kampf mit der Erosion;
- die Ansammlung von organischen Stoffen;
- Reduzierung der Kosten für Bodenbearbeitung;
- das Wachstum der Bodenfruchtbarkeit;
- keine Dichtungen im Boden.

Unter Nachteilen muss man Folgendes erwähnen:

- die jährliche Anwendung;
- die hohen Kosten der Ausrüstung-

Einführung der minimalen Bodenbearbeitungstechnologien hat auch Probleme bei Anpassung an ukrainische Bedingungen der Wirtschaftsführung. Dazu kann man geringe staatliche Förderung, erhebliche Kosten, Notwendigkeit des Ersatzes des Bestandes von Maschinen und Traktoren und Nutzung moderner Informationstechnologien zählen.

Besondere Beliebtheit hat heute weltweit die Gentechnik [2]. In der Ukraine sind Gentechnik-Forschungen rückständig wegen Abwesenheit notwendiger Förderung, materiell-technischer und finanzieller Sicherheit. Die besten Gentechnik-Pflanzen entwickeln sich überwiegend im Einklang mit klassischer Züchtung. Computer ermöglicht es, das Ergebnis der Züchtung vorherzusagen.

Bio-Landwirtschaft bedeutet außer anderem auch Verzicht auf Mineraldünger und Pestizide [3]. Mithilfe des Computers wählt man die am besten geeigneten Standorte für den Anbau dieser oder jener Produktion. Trend der Entwicklung der Landwirtschaft zeichnet sich durch Schaffung von Bedingungen für stabile Steuerung des Bodenbestandes.

Wissenschaftlich-technisches Fortschritt stimuliert schnelle Entwicklung der Nanotechnologien. Sie schaffen Möglichkeiten zum Erstellen und Modifizieren der Objekte, die völlig neue Qualität, Umsetzungs- und Integrationsperspektive für vollständig funktionierende Systeme anbieten.

Die oben gezählten Merkmale der innovativen Technologien lassen folgende Konsequenzen ziehen: der Einsatz innovativer Technologien im Agrarsektor der Ukraine ist sinnvoll und wird zur schnellen Entwicklung der Landwirtschaft, Erhöhung der Investitionen, Stärkung wirtschaftlicher und technologischer Sicherheit beitragen. Entwicklung und Einführung neuer Maschinen und Technologien in die Landwirtschaft öffnet einen breiten Weg für effiziente Nutzung der Arbeitskräfte, als auch materiellen und finanziellen Ressourcen. All dies wird dazu beitragen, den weiteren Ausbau des Produktionsumfangs der landwirtschaftlichen Produktion und einer vollständigen Befriedigung der wachsenden Bedürfnisse der Bevölkerung bei der Verwendung von begrenzten Ressourcen der Gesellschaft zu fördern.

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Session work №3

MODERN RESEARCH IN THE FIELD OF ECONOMICS

UDC 005.95/96

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PERSONNEL MANAGEMENT OF SYSTEM ENTERPRISE

Implementation of economic activity, the output that would be competitive in the domestic and foreign markets depends not only on the technical equipment of the enterprise, the availability of modern technology, clearly set system of quality control, market research, market environment and consistent implementimg the concept of moving goods to overseas markets but also on the skills of the company and effective personnel management. An effective system of personnel management in the company is becoming increasingly important as a factor in increasing competitiveness, success in the implementation of development strategies.

Control system is an ordered set of interrelated elements that have different functional purposes, operate autonomously, but they are aimed to achieve the overall objective [3, p. 15].

The essence of Personnel Management is in its purpose, which is formed as the efficiency of the whole enterprise system and its subsystem "personnel management" based on optimizing the interaction of its elements, coordination and ordering productive activities of employees.

Withstand adverse environmental factors and improve market position enable the development strategy of the company. In this connection it is necessary to form the mechanism of strategic management of the personnel. Design and implementation of human resource strategies allows better usage of human resources within the framework of the enterprise.

Personnel management as a science affects the operation of real companies, becoming the property of people engaged in the management of production. Modern conditions of enterprises place totally new conditions to the human resource

managers, implying higher intensity of their work, the ability to appreciate the time, have complex organizational and psychological qualities, provide a creative approach. In this connection improvement of quality content business managers on staff becomes particularly relevant. However, in Ukraine the situation where management personnel doe not not pay enough attention to the development technologies and personnel appointments are not perfect. In most cases there is no focus on achieving social efficiency in personnel management. This relates to the problem in a number of management personnel at different enterprises.

If you rely on international experience, such as in the US, their workers are selected according to criteria such as education, experience, psychological integrity, teamwork. American experience provides compliance office to management activities based on the mechanism of individual responsibility, individual performance assessment, development of quantified goals that are short term in nature. Management decisions are usually taken by a specific person responsible for their implementation.

In Japan, the situation is just the opposite. First human abilities are learnt, then they are selected for the post. Also in Japan, workers are hired on a long career of promising job growth, wages are paid taking into account the age of the employee, his seniority, educational qualities and abilities. In this country there is no tradition of division into three categories of workers (skilled, semi-skilled and unskilled). All workers at the time of their employment are not qualified. They will definitely improve their skills. Moreover, there is no clear distinction between the technical staff and workers. In Japan, workers are hired for a lifetime job, and if they are fired, or if they quit their job, they have a difficulty finding a job at another company.

Japanese firms have no rigid classification of fixed rate wages each. Duties among people clearly are not distributed clearly. It is encouraged to perform various types of work at flexible interaction among workers depending on the situation. Earnings are based on an individual assessment of the employee on many criteria.

Wage increases with seniority - one of the major components of the system. Other criteria are reflecting the contribution of labor, success and diligence in education and training, teamwork and so on. Great importance is the evaluation of the direct supervisor.

In Japan, wages are paid with consideration of seniority, marital status, etc., when an employee comes after college, he was paid a salary, when he married, the needs increase and wage increases. When a child is born, accordingly the salary increases. Education and training in Japan are usually carried out within the company. One of the important goals – developing different skills and abilities needed by a particular company. That workers can perform a wide range of manufacturing operations or they are qualified to solve many production and technical and administrative tasks, they should be familiar with all the production-technical system of the enterprise, the whole deal is used by technology.

An important factor which is thought to improve the quality of HR is its motivation.

Such means of motivation include: encouraging exercise (recovery) for success in career and business service and professional advancement of personnel; implementing incentive service and professional growth; motivation to perform service and professional growth; advance to executive positions; increasing wages.

An important stimulee for qualitative work is career. In order to achieve it the following requirements should be met: analyzing the effectiveness of management of labor and career advancement of personnel; analyzing the effectiveness of the training program, retraining and reserving; analyzing the effectiveness of selection, placement and use of personnel; analyzing the movement of personnel; analyzing the employment of the company potential and its divisions.

It will be useful to implement labor accounting, management reporting career, service and professional promotion and reserve personnel, accounting personnel promotion; monitoring performance of departments heads of business management career, monitoring the quality of teaching the proper usage of the personnel. An important condition of the enterprise is to develop plans to meet the requirements for personnel, for research workers for their career, help to the workers to fulfil labor. The state in this aspect will develop HR strategies to achieve and to carry the following functions: development of a flexible labor market that should be aimed at job employment centers; protection of national interests in the export and import of labor, providing flexible wages in the enterprise for the purpose of appropriate strategic approach and so on.

It is clear that a large number of ways increases the efficiency of HR management, each company chooses a path that depends on the specific activities and features already existing system of governance. The highest efficiency of administrative activity is reached in the case when they used a variety of purposes and methods of personnel management strategy that would build the best national and international experience.

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METHODOLOGICAL VALUATION PRINCIPLES OF THE EFFICIENCY OF ENTERPRISES BUSINESS ACTIVITIES

The question of the efficiency of economic entities business activities was of a great importance among the contemporary problems of the economy at any time. Not only the owners of private companies are interested in it, but also national leaders.

It is essential for the domestic enterprises under modern conditions to improve the efficiency of business activity, because only high efficiency helps to keep competitiveness and thus also profitability. The current situation of the economy that emerged in the market economy environment requires the need for searching new approaches to improve the efficiency of enterprise activity.

A. F. Aksenenko, Z.V. Atlas, V.P. Krasovskyy, A.V. Bachurin, A.H. Benuni T.G. Ben, B.M. Bolotin, O. D. Vasylyk, G. V. Gubin, E. P. Dunayev A. I.Kasyanov, I. J. Katz, Z. P. Korovina, V.V. Leontiev, O. L. Lordkypanidze, E. V. Oktyabrskyy, A. M. Omarov, R. M. Petukhov, V. S. Sinavina, T. S. Khachaturov, M. G. Chumachenko and other scientists have contributed substantially to the development of methodological principles of production and activity efficiency management at multiple economy and enterprise levels.

First of all, let's consider the essence of the concept of "efficiency". This concept means matching of the results of economic activity with the amount of resources expended. L.O. Kovalenko makes the point that the economic performance effect is a measure of company’s accuracy in solving its economic problems, taking into account satisfying the interests of its owners. [1, c.15] Thus considering the effects of economic activity over time such economic categories as volume of production; income received by the company carrying out business activities; profit or loss are analyzed .

Hence, the efficiency is the ratio between economic activity indicators of the enterprise and the expenses concerned with its carrying out.

General methodology of efficiency measurement is possible to formalize with the following ratio:

$$F = E/P \qquad (1)$$

where F - efficiency ; E - effect (result); P - expenses (resources).

Thus, the concept of efficiency of economic activity of the enterprise is wide-ranging. Therefore it is important to distinguish types of efficiency according to different criteria, either of which is of its importance for holistic operation of an enterprise.

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GRAIN CROPS PRODUCTION PROFITABILITY

Agriculture is one of the most important branches of national economy. It produces foodstuffs for consumers as well as raw materials for processing industry. That is why the urgent problem nowadays is solving the problem of further branch efficiency increasing.

Grain is the principal product of agriculture. Its gain and cost reduction is extremely important for national economy as it is the major condition for further improvement of people well-being [1, c. 377].

Grain crops make up more than 50% of all planted areas of agrarian enterprises. The mainline of grain production is concentrated in the Steppe and the Forest-Steppe Zones of the country. Approximately 50% of total grain volume in the country, more than 50% of winter wheat grain, 60% of corn, up to 40% of barley, more than 50% of millet and 100% of rise are grown in the Steppe [1, c. 381].

The *purpose* of the article is to consider theoretical bases of enterprise production profitability, its role in business activities. Grain Crops Production in Ukraine and present state of enterprise has been analyzed. Production indices and grain crops sales at specific enterprise have been calculated. On the basis of this research the ways to increase production profitability as well as principal branch perspectives have been determined.

For Ukraine the increasing of grain production volume as well as grain crops growing efficiency is the most important trend in development of agriculture [4].

The generalized indicator of agricultural production economic efficiency is the index of its profitability. Profitability means gaining profit by the enterprise being calculated by means of comparing gross profit or profit with costs [2].

Profitability serves to the following functions as:

- an appraisal index for efficient resources use by giving generalized assessment for enterprise operation in general;
- an index representing price appreciation of the total capital;
- a stimulus for workers to work effectively;
- a rate regulator for basic means increased reproduction [3].

For more detailed data analysis as for grain production the calculations of production indices as well as grain production realization at private enterprise "Communard" have been made.

Private enterprise "Communard" is the enterprise functioning on the basis of private ownership of one or several citizens.

The researched enterprise is engaged in plant growing and animal husbandry production. More detailed analysis needs using the production indices for the last 3 years.

Among grain and leguminous plants winter wheat and sunflower are the leading crops while there is the tendency in winter wheat decreasing in 2015 for 50,21% comparing with 2013; while sunflower production has grown, quite the contrary, from 3534,3 thousand hryvnas in 2013 up to 4348,8 thousand hryvnas in 2015.

According to calculations production profitability level and marketing of cereals last year were low at all types of products. The following ways to increase profitability as well as cereals marketing production have been proposed:

- to develop the output of commodities and services production and realization;
- to decrease the expenses per production output decreasing its cost price;
- to allocate reasonably profit having been obtained before to receive the optimal effect [6].

In conclusion it should be noted that taking into account the calculations and research having been conducted the following measures are proposed to increase both crop capacity and profitability index [5]:

- introducing high yielding sorts and hybrids
- conducting disease, pest and weed control
- improving the quality and increasing the realization price and others [1].

At the example of barley growing it was proposed to introduce new high-yield varieties "Vakula" and "Sobornyi" providing to increase yielding per 25%; introducing "Alfa Grow E" mineral fertilizer in optimal doses under barley enables to increase qualitative and quantitative harvesting indices per 10-20%; using highly effective protection plants means, in particular, "Efiron" herbicide.

On the basis of above given data and perspective growing regulatory costs for barley the calculations reflecting the results of costs planning and their impact on the full cost of production, profit received by the enterprise and the profitability of products.

Table

Resulting indices for perspective valuation costs when barley growing

Indices	Project
Acreage, hectares	387,33
Production cocts for products growing, thousand, gryvnias	3453,12
Yield, hundredweight/hectar	47,45
Gross harvesting, hundredweight	18378,81
Marketability level,%	95,00
Sold, hundredweight	17459,87
Manufacturing cost of 1 hundredweight , gryvnias .	72,77
Total cost of 1 hundredweight (selling expences per 10% of manufacturing cost), gryvnias .	80,05
Selling price per 1 hundredweight, gryvnias	450,00
Sales revenue, thousand gryvnias	7856,94
Total cost of sales, thousand gryvnias	1397,61
Income from sales, thousand gryvnias	6459,33
Prifitability of products, %	82,21

Analyzing the table data it can be seen, that at crop capacity 47,45 hundredweight/hectare enterprise can get 18378,81 hundredweights of barley, that is per 44,7% more than last year. Selling 95% of croppage at the price of 450gryvnias receipts will make up 7,85 mln UAH. Taking into account 1,39 mln UAH of total cost for products sold profit from barley selling equals to 6459,33 thousand gryvnias. The profitability of products has been defined as equal to 82,21%, namely from 1 gryvnia of total cost after recovering costs enterprise will get 0,82 gryvnias profit.

All in all, appropriate introducing of considered arrangements complex will enable to increase grain production to needed quantity, decrease production costs, increase production quality and, as a result, increase realization price allowing the enterprise to increase its profit. These arrangements may positively impact grain crops production and improve its level.

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OPTIMIZATION OF ENTERPRISE’S CAPITAL STRUCTURE

To optimize the structure of capital is a significant and difficult task, which is solved in the course of enterprise’s financial management. The optimal capital structure indicates the ratio of using own and borrowed funds at which the productive factor of proportionality between financial profitability and enterprise’s financial viability is provided, that is, its market value increases. But we should take into account a number of subjective and objective factors that have an impact on the capital structure.

As the capital structure performs a direct impact on the final results of the company, one should consider all the properties of both own and borrowed capital. Let us examine the advantages and disadvantages of equity (Table. 1).

Table 1

Positive and negative features of equity

Advantages

- the ease of involvement, because decisions related to the growth of equity are made by company owners and management without the need to obtain the agreement of other

economic entities;

- the great potential of profit creating in all the fields, as when it is used it is not necessary to pay interest on loans in all its forms;
- ensuring financial stability of enterprise development and solvency in the long run, and therefore the reduction of the risk of bankruptcy;
- the increase in the financial capacity of the company;
- the ability to make gain in financial return on assets as a result of financial leverage.

Disadvantages
- the limited scale of involvement;
- the unused growth prospect of return on equity by taking into account the financial leverage effect;
- the assets emerged due to debt capital, bring the lower rate of income;
- there is the threat of financial risks in economic activity, the decrease of financial stability, solvency, bankruptcy of the company;
- the great dependence of debt costs on the shifts in financial market conditions;
- the complexity of the operation of bringing within large scales in the current environment.

Thus, the companies that use borrowed funds, have mostly excellent financial strength as a result of the formation of additional asset size, but there is an increased risk of bankruptcy here. The task of managing its capital structure is to ensure its optimization. The formation of optimal capital structure is based on a large number of payments of enterprise's activity indices at different relations of own and debt assets. The optimization of capital structure is carried on the following criteria:
- reducing the average cost of capital;
- the increase in profitability of equity;
- minimization of financial risks.

The optimization of enterprise's capital structure is performed according to the following stages:

The first phase is the analysis of company's capital. The main aim is the manifestation of trends in scale moving and composition of capital before the planning period and their impact on financial stability and efficiency of the capital application. The first stage of the analysis examines the dynamics of total volume and the main components of capital relatively to the dynamics of the scale of production and sales; determines the ratio of equity and debt capital, its tendencies; considers the ratio of long- and short-term financial obligations within the debt capital; underlines the value of urgent financial obligations.

The second stage of the analysis involves the discussion of ratio systems of enterprise's financial stability, which is characterized by its capital structure. In the course of the analysis we calculate and study the change of the following factors:
1) the ratio of autonomy;
2) the ratio of financial leverage (the ratio of funding);
3) the ratio of long-term financial independence;
4) ratio of long- and short-term debt.

With the help of the analysis of enterprise's financial stability we can describe the level of stability of its financial growth and extent of financial risks, which form the danger of bankruptcy.

The third stage of the analysis evaluates the effectiveness of use of individual components of capital in general. During the implementation of the analysis we determine the change of the following indicators:
1) the period of capital turnover;

2) the rate of return on equity;
3) capital productivity ratio;
4) capital intensity of sales.

The next step is to assess the determining factors that characterize the capital structure formation. There are no ultimate techniques of effective ratio of equity and borrowed capital not only for similar companies, but also for a single business at different stages of its development and with different conditions in commodity and financial markets. But if we take into account a chain of objective and subjective factors, it will allow to generate capital structure consistently and provide the most productive conditions of its application at each specified company. The key of these factors are: the industry characteristics of the enterprise's activities; the life cycle of the enterprise; commodity market conditions; financial market conditions; operating profitability level; the ratio of operating leverage; the relation of creditors to the company; income taxation level; the degree of equity concentration.

Taking into consideration these factors, the management of capital structure in the company has two main directions. They are the optimal levels for the company, using its equity and debt capital, and ensuring the involvement to the enterprise the necessary types and amounts of capital to achieve estimates of its structure.

The next stages are:

1) the optimization of capital structure on the growth standard of financial profitability degree. To perform these optimization calculations the mechanism of financial leverage is used;

2) the optimization of capital on the standard of reducing its cost. The course of this optimization is based on the primary analysis of the cost of equity and debt capital in different conditions of its involving and performing a large number of computing the average cost of capital;

3) the optimization of capital structure on the criterion of the reducing the degree of financial risk. According to this purpose all the assets of the company are classified into three groups: non-current assets; the permanent part of current assets; the variable portion of current assets.

There are three diehard approaches to finance different groups of enterprise's assets:

1) the conservative approach that determines the use of equity and long-term liabilities to create non-current assets, the permanent part and the half of the variable portion of current assets;

2) the compromise approach that provides the funding for non-current assets and the permanent part of current assets at the expense of equity and long-term liabilities. The variable portion of current assets is financed by short-term liabilities.

3) the aggressive approach that provides the guidance on the use of equity and long-term liabilities to finance non-current assets and only the half of the permanent part of current assets. The variable part and the half of the permanent part of current assets appear as a result of short-term debt capital.

Depending on your attitude to financial risks business owners or managers choose one of the varieties of financing assets. The cons of above-mentioned methods are the fact that they include a small number of factors and they are opposite in their directions. As a result, the positive effect of financial leverage effect has increasing profits formed additionally on equity, but also causes worsening financial state, that is the breach of solvency. Increasing financial risks are also caused by minimizing the average cost of capital.

Thus, the optimal capital structure can assume the correlation between equity and debt capital, which will allow the optimal combination of risk and return for the enterprise, maximize the market value of the company, ensure the high level of solvency and financial stability. The main condition of enterprises' financial resources forming at the expense of borrowed funds is drawing capital at low cost and low risk in order to achieve maximum profit. The is no specific definition, with the assistance of which one can calculate the optimal capital structure though any solution must take into account the value of tax payments, business risk, asset quality, the availability of funding.

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IMPLEMENTATION OF ELECTRONIC TICKETS IN PUBLIC TRANSPORT

Nowadays Ukraine and the whole world become more and more involved in the process of digitalization (penetration of digital technologies, automation and IT in all levels of life and economy). Therefore, transition to cashless payments becomes a vital problem. At present, the relevance of non-cash payment systems has increased significantly – in every sphere of life application of such systems increases. So, the investigation of the issue is of particular relevance.

On February 22, 2016, the Verkhovna Rada of Ukraine adopted the Law "On amendments to some legislative acts of Ukraine on introduction of automated system of fare accounting in urban passenger transport". The legislative act introduces automated fare collecting system in public transport, provides appropriate powers to local authorities, establishes mandatory electronic tickets provision in the settlements where the automated fare accounting system is introduced for passengers who have privileges and determines the possibility to fine those passengers who travel by public transport without travel documents registration or composting [3].

The adopted law of e-ticket is the introduction of an automated fare accounting system in public transport. The essence of the law is therefore to allow cities to implement the system independently. The law stipulates that every single city can, at will and according to their financial capacity and economic activity, determine how to organize the electronic system of transport services in the city [1].

The term of implementation in each city will depend on the decision of the local government as well as other details like a system interface, proper software developing, e-tickets production. The city government will determine the type, form of media, the order of travel documents circulation and registration, approve rules for the use of public passenger transport [1].

The expected results of the e-tickets implementation are as follows:

- improving road safety (the driver will monitor the road and will not be distracted by collecting the fare);
- record of the real passenger traffic;
- routes optimization;
- fighting corruption and money withdrawal from the "shadows";
- implementation of convenient payment methods for travel – via a bank card, a mobile phone, etc.;
- as a result, comfort for passengers;
- real reform in accordance with the European principles that will have an impact on the economy across the country [2].

Thus, the e-ticket system will provide the citizens with convenience, accessibility, time saving potential, creating a convenient online platform to provide every citizen an opportunity to buy a ticket via the internet from point A to point B for any kind of transport. Another significant advantage is the possibility of storing the ticket in electronic form in case of lost paper ticket. Implementation of this system will influence the growing non-cash payments sphere, which in the future will improve the quality of life and economic growth rates in the country.

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UDC 330.3

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LEASING AS MEANS OF INCREASING ASSETS EFFICIENCY AT ENTERPRISES

Ukraine has chosen the European way of development, so native enterprises were able to compete with foreign enterprises and they should significantly improve leading business, leading an active search for and implementation of unconventional measures to modernize management decisions, and industrial software enterprises, improve competitiveness with a wide involvement of scientific and technological progress. One of such measures refers to leasing assets.

Property and equipment may serve the cornerstone by which the company provides functioning in a particular market, retains its competitive position and most importantly can make a profit for further development. Therefore, any business, especially manufacturing, where the financial position and competitive products or services directly depends on the condition and efficiency of fixed assets should actively implement measures to improve the efficiency of their use. However, all enterprises Ukraine are now facing the problem of limited financial resources and difficulty in finding long-term financial investments to increase economic efficiency. The banking system in Ukraine is not very reliable and the ability to get a loan on favorable terms is limited, leasing is the most accessible and beneficial tool for business development. Economic Code of Ukraine gives the following definition of leasing: "Leasing is an economic activity aimed at investing own or borrowed funds, which is to the lease agreement of one party (the lessor) to the exclusive use of the other party (lessee) for a specified period property owned by the lessor or acquired by him in the property (economic committal) on behalf of the lessee or approval from the relevant supplier (seller) of the property, provided that the lessee periodic lease payments. According to the Law of Ukraine "On Financial Leasing" (p. 3) the contract of lease may be: non-consumable thing with individual characteristics and according to the laws attributed to fixed assets; property located in state or municipal ownership and for which no prohibition is used and / or possession can be leased to the procedure established by this Law. Land and other natural objects, the only property complexes of enterprises and their structural divisions (branches, workshops, stations) may not be leased.

In Ukraine, the lease is beginning to take a broader application. In recent years, the number of financial and technical professional management companies has significantly increased, and there have been significant and positive changes in the legislation governing the lease.

Leasing is a symbiosis of lease and loan, but it has unique advantages inherent in this type of investment. These benefits should include:

• ability to legally reduce the tax base, as lease payments of interest and in the Commission refering to gross expenditures, which automatically reduces the profit;

• lessee receives a tax credit for VAT immediately with all the value of the lease by paying only a down payment;

• lessee after receipt of property in leasing puts it on its balance sheet and charges depreciation , as in tax and accounting;

• At the conclusion of the lease agreement does collateral is not needed, since the receiving bank loans;

• Lease will allow a given property in their property using delay; it significantly reduces the cost and allows payments efficiently managing our assets;

• The company can quickly get the necessary equipment without incurring substantial capital investments;

• The opportunity to lease payments in various forms: cash, commodity or combined;

• Leasing allows you to quickly obtain the necessary equipment to ensure efficient production process through a temporary use and not by spending money to buy enough moral aging and cost of equipment;

• Leasing avoids the need of taking bank loans for the purchase of fixed assets.

The Civil Code of Ukraine is determined by two types of leasing: operational and financial leasing. Operational leasing has got significant differences from the lease, while the financial leasing has not . Using the financial leasing company can meet some difficulties. Under the lease agreement the lessor lesee transferred property is key to the proper performance of the contract last. That is, if he lessee has faced some financial problems and does not timely lease payments, the lessor has the right to withdraw the transferred property. Payments by the lessee is nothing but a recovery of the property at a time can be purchased by the lessee under residual value. However, if the above mentioned situation there data fees will not be returned to the lessee, i.e. the risk of losing and fixed assets, and funds have been spent on leasing.

Perhaps the main drawback of leasing in Ukraine is its cost. Today leasing is expensive, which can not be afforded by every company. Over the lease the term “fixed assets” could increase in value by half. Accordingly, the longer the term of the lease, the more expensive it becomes for the enterprise.

Enterprise-lessee after the expiration of the contract can buy fixed assets. However, it may happen that during the period of the contract value of equipment has increased significantly and this agreement is unprofitable. Another thing that plays in favor of leasing is that the leasing company has provided information for the miscalculation cost of additional services, because by law, this information relates to trade secrets.

There are also some obstacles of leasing in Ukraine. Among them is providing two factors: the legal basis and the cost of leasing. At the state level, primarily with

the help of the legislature, it should be promotion of leasing, because it is really beneficial for economic development. The state takes a passive role in the development and expansion of the leasing market, although the possibilities are great. Negative influences and low level of education and potential customers are realizing the benefits and opportunities of leasing. Usually it is seen as a kind of lease rent, which is usually a mistake, because the lease provides for non-durable anniversary and its return after the expiry of the contract and lease provides long-term use and acquiring property in through the purchase of the residual value after covering all lease payments.

The cost is the main factor that puts the adoption of an economic decision. After paying lease payments the company still has to pay the leasing company. However, many companies in the leasing see an attractive alternative to purchase fixed assets as necessary and effective development of business, because they do not have to deal with the design, delivery and insurance - all this assumes leasing company. In developed economies specialized leasing companies, saving money for large scale operations in the purchase of equipment to parties of the same suppliers / manufacturers are able to provide lessees are much cheaper compared to bank credit services.

According to experts of the Association "Ukrainian Union of Lessors", which was established in 2005 as a voluntary union of professional participants of leasing, the trends in the leasing market in Ukraine today are the following: reducing the number of leasing companies that are actively financing agreement; focusing on the effective administration of the existing portfolio and maximizing return of previously invested financial resources; the agricultural sector is the primary consumer leasing companies; agreements on rare and highly items (agricultural machinery, cars, etc.); cooperation only with stable companies that have at least 3 years of successfully operating in the market; active implementation of seized items to re-lease or sale.

Summarizing all mentioned above it should be noted that the lease is a kind type of credit to companies that provided in the form of fixed assets and provides update of assets. Leasing provides a number of advantages among which in the first place is a new required equipment that makes it possible to increase production capacity without the involvement of bank credit. Also an advantage is that the depreciation of such fixed assets is calculated on an accelerated method that enables faster update fixed assets and significantly reduce the income tax. The use of leasing makes it possible to reconstruct, expand and upgrade fixed assets of the company. So, as leasing is paid, it encourages the company to more effective planning their financial resources to properly fulfill this debt. Although the current situation in Ukraine is quite complicated, but there is expansion of the leasing market and increasing its attractiveness to potential new customers. Leasing a very important and positive impact on the economy of the country, it is used in almost every sector of the economy of Ukraine.

UDC 311.1

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JOB SATISFACTION AND ITS EVALUATION

Job satisfaction, its maintenance, evaluation and improvement are important issues for companies because satisfied workers can be a key to success of the company.

Work is a purposeful human activity in which it affects the nature and it is used to produce material goods necessary to meet people's needs. The work is one of the basic conditions of human life and society. It is a work activity on the basis of social relations and it affects relations and people interaction. Moreover, it is of great importance in the process of identifying formation. Based on this, job satisfaction is a state of balance between the requirements of the worker to the content, kind and conditions of the work, and subjective assessment of these requests feasibility.

Currently scientists use two approaches to interpretation of job satisfaction. The first approach is based on understanding work as a process of human needs. Thus to the theory of job satisfaction there were introduced terms such as demand, motivations, attitudes, attitude. Accordingly, the direction of job satisfaction is implied into assessment of satisfying needs that person seeks to meet in areas related to the process of labor.

The second approach comes from a different view on the concept of "work" which is interpreted as the social division of functions, which realized the existence system, or as an activity in the social division of labor. Society is understood as a product of human interaction based on the division of labor.

Based on these approaches, job satisfaction can be seen as a process by which human needs are satisfied by social division of functions. Thus, based on these approaches, scientists isolated job satisfaction theory, the meaning of which is revealed through the following concepts:

- social status - a status of an individual (or a group) in the social relations and relations caused by its membership in a particular social community and defines a set of rights and responsibilities;
- social sharing - a special type of social action - stimulatory reactions of the people.
- social comparison - a concept that means matching the subject of some of its own characteristics with the characteristics of another subject which based on the adopted system of values.

Job satisfaction can be viewed at two levels:

Level 1 - affective job satisfaction;

Level 2 – cognitive job satisfaction.

Affective job satisfaction is an emotional feeling about the work as a whole. The cognitive one is considered as cognitive job satisfaction and it shows how happy

employees are, it reveals their feelings about some aspects of work, such as wages, other tangible and intangible benefits.

Job satisfaction is influenced by several factors, including the most important:

1) wages;
2) work;
3) personal interest to the work;
4) promotion possibility ;
5) leadership style;
6) colleagues;
7) working conditions.

Job satisfaction of employees is an important part and should pay attention to the management of the company and monitor its condition from time to time.

Assessment of the of job satisfaction status at an enterprise is possible by comparing the expectations of the employee regarding working conditions, payment, career opportunities, training, labor protection.

After studying and analyzing methods of research and measurement of job satisfaction we concluded that most effective one is the implementation of a sociological research based on the polling. This questionnaire includes questions about concerning factors influencing the job satisfaction level of the employee.

The indicators determining job satisfaction comprise relationship with colleagues, high level of safety, high level of wages, the favorable sanitary and hygienic working conditions, modern equipment, opportunity for career growth, the existence of an inverse association with the administration of the enterprise, the possibility of training and improvement of qualifications, scientific work organization, diversity works, a creative and innovative approach to work performance, work motivation, organization of leisure of employees and encouraging them to active rest with the team.

Evaluation of job satisfaction of the employees at the enterprise should be on the basis for management decisions in the sphere of personnel management and finding ways to minimize the negative impact of certain factors that affect its level.

Increasing the level of job satisfaction is going to change the attitude to work in the direction of its perception as the essential values of human life.

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UDC 657.31

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BUDGETING IN A SMALL BUSINESS AS THE KEY TO SUCCESS

The theme of budgeting in a small business is very important nowadays, because every manager, who works for a big company, knows what it is and makes different types of budget, but not every proprietor of a small business knows what budgeting is. They believe that the budgeting and planning are a waste of time, because they must expand their business and focus on more important things.

But they are wrong, because it is the budget that helps save money and increase capital. For established small businesses, a budget can be used to take the pulse of the business and help identify possible future investments. Budgets can also be instruments in attracting investors, convincing banks that the business is good, or bringing on new partners or customers [2].

On the whole, budgets usually represent a detailed plan of how a company expects to spend money in future periods. Most companies make budgets on an annual basis that helps them to save resources [1]. There are many types of budget, such as: sales budget, direct labor budget, finished goods budget, manufacturing budget, selling and administrative expense budget etc. A variety of budgets depend on the specifics of the enterprise and accounting documents on which they are formed. And since the accounting for small businesses is very different from accounting of the big firms, the budgeting for these companies has its own special principles given in Table 1.

Table 1.

Fundamental principles of small business budgeting [3]

#	Principle	Explanation
1	Periodicity	The budget should be made at least once a year for the next calendar year.
2	Conformity	The budget should coincide with or be a fraction of the financial year, but always so that it ends with the closing of the accounting records for the year.
3	Planned character	The budget is the determinant of a plan.
4	Effectiveness	Every budget in a small business should show a profit.
5	Systematicness	The budget is an important part of management, it is a plan of financing and activities, and one cannot forget the budget.
6	Control	The managers need to monitor the implementation of the budget and adjust it if necessary.
7	Accounting confirmation	You cannot create a good and useful budget without responsible financial management in the company, and without accounting documents.

Compliance with all these principles ensures the effectiveness of the budget

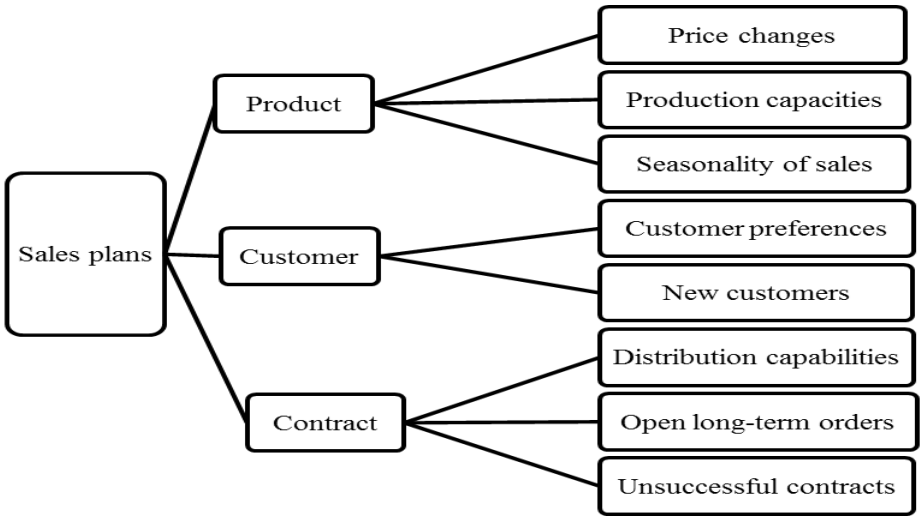
and as a result a high company profits.

Usually small businesses do not exercise large amounts of economic activity and have simplified accounting. That is why it is impractical to develop many different budgets. The most effective way out in this situation is to develop only sales budget.

The sales budget contains an itemization of a company's sales expectations, price and expected revenue from the sale of each product (goods and services) for the budget period. It is quite difficult to derive a sales forecast that proves to be accurate for any period of time, so an alternative is to periodically adjust the sales budget with revised estimates, perhaps on a quarterly basis. The budget should consist of two parts: sales plan and cost statement [3]. Sales forecasts can be based on three types of information:

- What customers say about their intentions to continue to buy products;
- What kinds of customers are actually on the market;
- What customers have done in the past in the market.

Sales plans can be made in several ways, it does not have the typical form and may be made in any form, some of which are shown in Picture 1.



Picture1. Different types of sales budget for small businesses

In the conclusion we can say that budgeting for small businesses is the key to success, because it makes the company more stable and resilient to market changes. Budget planning will allow the company to grow continuously and to take market leadership in the future.

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UDC 657

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PECULIARITIES OF ASSESSMENT OF FOUNDERS' FEES TO REGISTERED CAPITAL

A formation of the registered capital is the beginning of any enterprises' foundation and registration. Current complicated conditions of national companies' performance result into problems related to the stability providing and firmness of their functioning. Structure and dynamics of the registered capital are one of the important indices that determine the financial condition of the company. The registered capital should act as the basis of economic activities and guarantee of ensuring the rights of different legal entities as well as individuals who have direct financial interests in the enterprises' outcome.

The information required for effective management of the enterprise's equity capital is accumulated by accounting system and financial reporting. Complete disclosure of information about forming of and using the equity capital will increase the reliability of the information necessary for decision making aimed at ensuring financial stability of an enterprise.

The issues of accounting, recording the changes and reporting of share capital are investigated by M. Demyanenko, T. Marenich, S. Golova, M. Ogiychuk, V. Sopko. Taking into the consideration current development of the economy as well as the needs of management the organization of accounting for share capital requires further development and improvement.

As the result of analysis of articles, published works, current legislation the term "registered capital" has been defined as the basis of enterprises' activity that is formed by company's founderss fees.

One of the stages of formation of the registered capital is the valuation of property intended for its formation.

During the evaluation of contributions in monetary form there is no issues: the amount of money contributed into the company is the size of founders' fee to the share capital. In turn, the valuation of property contributions has its own characteristics.

If the founders don't use the services of an expert, they choose the property assessment criteria on their own. The document that records property evaluation in those cases is the act of evaluation, compiled and signed by founders.

Both individuals and legal entities can contribute to the share capital. Tax Code of Ukraine [1] defines the peculiarities of taxation of these transactions, namely on taxation of value added tax and individual income.

Summing up, we note that there is the problem of assessing property contributions to the registered capital, as none of the legal documents that govern the formation of the registered capital, do not contain specific requirements on how this procedure can be done. Evaluation on the consent of the parties may lead to wrongful

overstatement or understatement of contribution. Therefore, it is necessary to establish clear limits of property assessments at the legislative level.

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UDC 338

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ENTERPRISE LABOUR POTENTIAL EVALUATION

Nowadays the key to success of any enterprise is not only presence of effective technical equipment, but also high personnel productivity. A number of Ukrainian and foreign scientists have devoted their works to this subject. However, there are still no unique evaluation techniques in labour potential of the enterprise. The main problem is that most works focus on the structure of the enterprise and its occupational workforce.

In our opinion, the best way to evaluate labour potential of the enterprise is to pay as much attention as possible to the evaluation of each single employee's labour potential. It is the employee who makes brigades, sections and the enterprise itself.

A priority task of this assessment is efficiency of labour potential of each single employee and the level of its using, the analysis of the employee's adequacy for the job, and, also the analysis of efficiency of its labour activity, evaluation of degree and value of the particular employee for the business entity.

The most valuable resource for the enterprise is the man and his intelligence. Only highly qualified workers respond to the environment changes quickly, manage business processes effectively, create and implement innovative projects in all fields of operation.

Enterprise labour potential evaluation is a difficult process. It focuses on the full cooperation with the external environment. It should be implemented with high quality. One should also point out the principal constituents of its elements' development and influence on their equitation and income.

Labour potential of the enterprise must be formed on the basis of economic analysis of workers' professional skills and competence. It must earn a certain amount of profit. The higher the worker's efficiency and the time of his activity are the higher profit the enterprise gets and the more useful the employee is for the enterprise.

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UDC 612.914

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STOFFLICHE UND NICHTSTOFFLICHE MOTIVATION DER TÄTIGKEIT

Modernes System der Personalleitung wirt auf die Menschen basiert, wo sie die wichtigsten Wirtschaftsressources des Unternehmens, die Quellen des Einkommens und des Erfolgs des Unternehmens sind. Man kann behauptet auf diesem Grund, daß die Untersuchung dieser Frage und zwar die Beeinfluss der Motivation die Arbeitsproduktivität sehr aktuell ist. Man muß bezeichnet, dass die Werke von Kusmin A.E., Kredisova A.I., Yatsura V., Cherkasov V.V., Nemzow V.D. während der Untersuchung analysiert werden. Jeder aus den obengenannten Forschern betrachtet die Motivation wie eine psychologische Kategorie, die der Arbeit anregt.

Motivation ist eine der wichtigsten Funktionen des Personalmanagments, weil um das Hauptziel zu erreichen, leraucht man Arbeitsablaut der Menschen. Jeder effektiver Leiter versucht Mitarbeiter zu überzeugen, besser zu arbeiten, die interne Motivation zu schaffen, aktive Interesse an der Arbeit zu halten. Es ist auch wichtig, dass die Arbeitnehmer, die Ziele der Organisation freiwillig und kreativ zu erreichen. Doch in der Praxis gibt es oft ein Bild der ungeschickten Anwendung der Motivation und als Folge sind der hohen Fluktuation der Arbeitskräfte, geringe Leistung. Um dies zu vermeiden, sollten Manager nicht nur stoffliche Motivation, der Arbeitsnehmern sondern auch nichtstoffliche (moralische) geben. Deshalb können wir sagen, dass die Motivation ratsam ist stoffliche und nichtstoffliche zu teilen ist. Stoffliche Motivation ist die naheliegendste Möglichkeit, Mitarbeiter zu belohnen. Es ist ein System finanzieller Anreize der Arbeit, deren Ziel es ist, das Verhältnis der Löhne der Arbeitnehmer mit der Quantität und Qualität der Arbeit zu gewährleisten.

Unter der stoffliche Motivation sollte den Wunsch des Reichtums, ein gewisses Maß an Reichtum, stoffliche Lebensstandard verstehen. Der Wunsch des Menschen sein Wohlstand zu verbessern erfordert die Erhöhung es Arbeitseinsatzes und damit die Anzahl, Qualität und Quantität der Arbeit. Besonders relevant ist die Frage der stoffliche Motivation für die marktwirtschaftsentwickelte, Länder als auch die Ukraine. Dies ist durch mindestens zwei Gründen bedingt:

1) durch niedriges Einkommen, Verformungen in der Struktur und Differenzierung;

2) durch Notwendigkeit der Entstehung neuer *Inhalteformen* und Methoden der stoffliche Stimulierung in der Wirtschaft der Beschäftigten.

Die führende Rolle in der stoffliche Motivation gehört dem Lohn als der wichtigsten Form von Einkommen der Mitarbeiter.

Erstens reduziert höhere der Lohn in der Ukraine (im Vergleich zu den durchschnittlichen marktwirtschaftlicheng) Fluktuation der Arbeit Kräfte, und sorgt für die Bildung eines stabilen Team. Wenn die Fluktuation der Arbeitskräfte senkt, hat der Arbeitgeber die Möglichkeit, die Kosten für ihr Dingen und Ausbildung zu speichern, um die freigesetzten Kapital in der Entwicklung der Produktion investieren, und es erhört die Wettbewerbsfähigkeit der Produkte.

Zweitens, ermöglicht der hohe Lohn es, auf die best Arbeitskräfte dem Arbeitsmarkt zu wählen, und nächtlich: erfahrene, initiative, erfolgsorientierte, um die Arbeitsproduktivität möglicherweise höher als durchschnittliche wird.

Ebenso wichtig ist die nichtstoffliche Motivation. Unter nichtstoffliche Motivation wir verstehen, solche Förderungen, die der Arbeitnehmer nicht in Form des Bargeldes oder zahlungsunwirksames Geldes ausgibt, und außerdem kann das Unternehmen zu in die Qualität der Arbeit investieren, nämlich in die Möglichkeit der Entwicklung und Ausbildung, Karriereplanung, Verbesserung, reduziert bezahlte Mahlzeiten für die Arbeitnehmer usw. Der Haupteffekt wird durch nichtstoffliche Motivation erreicht werden konnte, sind die Erhöhung der Loyalität und des Engagement der Mitarbeiter im Unternehmen.

Ein interessanter Weg, um die Motivation zu verbessern, ist die Motivation durch die Freizeit oder das modulare System für die Kompensation der Freizeit. Als Besondere-Freizeitmotivation ist es, dass Unterschiede in der Belastung Arbeitnehmer aufgrund zu verschiedenen Tageszeiten und Wochentagen zu arbeiten kompensiert direkt freie Zeit anstelle von Geldleistungen für die Bereitstellung, wie im herkömmlichen System üblich ist, diese Form der nichtstoffliche Motivation ist noch nicht unter den ukrainischen Unternehmen populär, aber die Erfahrung ihrer ausländischen Firmen zeigt die Notwendigkeit der Verwendung der Freizeitkompensation in diesen Ländern. Der Einsatz von flexiblen Arbeitsformen (Arbeitstag, Urlaub, flexible Arbeitszeiten, Freie Tage, etc.), ermöglicht die Auswahl der Freizeiten und Arbeitszeiten.

Insgesamt ist die Arbeitsmotivation eine sozioökonomische Grundlagen von Verhalten und verstärkte Anstrengungen Personal (Organisation) darauf abzielen, die

Effektivität ihrer Aktivitäten zu erhöhen. Das System beschreibt die Motivation eine Reihe von miteinander verknüpften Aktivitäten, die einzelne Mitarbeiter oder Arbeitsgruppe als Ganzes fördern individuelle und gemeinsame Ziele des Unternehmens (Organisation) zu erreichen. Das System der Motivation auf Unternehmensebene sollte auf spezifischen Anforderungen basieren, wie zum Beispiel:

- Schaffung geeigneter Bedingungen für die Gesundheit, die Sicherheit und das Wohlergehen aller Mitarbeiter zu schützen;
- Bereitstellung von Chancengleichheit für Beschäftigung und die beruflichen Aufstiegskriterien für die Durchführung der Arbeiten;
- Koordination Lohn ihrer Ergebnisse und die Anerkennung der persönlichen Beitrag zum Gesamterfolg. Dies bedeutet eine gerechte Verteilung des Einkommens, je nach dem Grad der Steigerung der Produktivität;

Pflegen Sie Vertrauen in das Team, das Interesse an der Realisierung des Gesamtziel, die Möglichkeit, zwei-Wege-Kommunikation zwischen Managern und Arbeitnehmern.

Folglich sind alle Organisationen und Unternehmen verwenden eine Vielzahl von Methoden und Techniken, Arbeiter zu stimulieren. Allerdings bevorzugt die primäre stoffliche Motivation. Denken Sie daran, dass ein System der Motivation der Wahl sicherlich Berücksichtigung der Bedürfnisse und Interessen der Arbeitnehmer zu nehmen. Zufriedene Mitarbeiter, die verbindlich arbeiten - Der Prozess der Implementierung des Systems sollte bei Erreichen eines bestimmten Ergebnisses angestrebt werden.

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INSURANCE AS A FORM OF PROVIDING CONSUMER CREDITS

Today consumer credit is the most necessary form of short-term lending. This type of loan expresses the relationship between a lender and a borrower and it is provided to legal entities and natural persons for consumer purposes.

The bases for the classification of consumer credit are the following main characteristics:

1) the type of lender (banks, non-bank institutions);

2) the method of issuing consumer credit (monetary, commodity, commodity-monetary credits). Monetary consumer credit can be direct (credit cards, credit lines, check credits, etc.) and indirect (financing the sale of goods in installments);

3) targeted nature (investment loans, loans for current consumer needs);

4) urgency (short-term, medium-term, long-term loans);

5) security of consumer credit (blank and secured loans);

6) the way of paying interest (ordinary and discount loans);

7) the nature of funds turnover (single and revolving loans);

8) the loan currency (loans in national currency, foreign currency, in several currencies);

9) the method of repayment (loans that are repaid a one-time, and loans with installment payments).

The role of a lender of consumer credit can be performed by specialized credit institutions or simply by legal entities that sell goods or services. Consumer credit is provided in cash or in the form of commodities. In cash, it is given as a bank loan to an individual for the acquisition of movable or immovable property. It can also be provided by a non-bank credit institution (pawnshops, credit unions, etc.). In the form of commodities it is given in the process of functioning of retail trade in consumer durables with a deferred payment [1]. However, regardless of the form of lending, each loan transaction is accompanied by the risk of non-repayment of the loan. In case of unforeseen insolvency of borrowers, insurance protection of interests of creditors is applied. This type of insurance is a classic example of the synthesis of insurance and banking cooperation.

The reasons of insolvency of consumer loans for a long time were the death or partial loss of ability to work of a borrower. Upon the occurrence of a different situation, a borrower loses the opportunity to earn on a regular basis or to make a profit. Thus, the main risk to the debtor's family budget is still considered to be the case of his death, and the additional risk is the case of incapacity for work. The structure of the accumulated risk of incapacity for work can include the risk of unemployment, which in most life cases can also lead to loss of profits and inability

to repay the debt within a specified period. A separate risk may be an unforeseen loss of profit or irregular income of a debtor [2].

Today the problem of borrowers' failure to fulfil their financial obligations on consumer loans is quite acute. The causes of insolvency may be unemployment, death, total or partial disability of the borrower resulting in loss of income and inability to repay the debt on time. It leads to an increase in insurance payments. In some cases this type of credit insurance generally becomes unprofitable.

Insurance rates are formed taking into account the amount of the first payment by the buyer, the number of certain periodic repayments of the loan (the period of its provision) and, of course, the reliability of the borrower, which can be quite volatile [3, p. 294].

The main means of combating imitation of insurance cases by insurers are dealing with banks that value their reputation; introduction of new effective forms of financial services which are attractive to the public, such as granting loans secured by insurance policies, etc.

Consumer credit is granted in the amount not exceeding the total annual income (according to the documents submitted by the client) plus the amount of the percentage of the cost of goods (this amount is the first installment of the client and it must be credited to the client's loan account on the day of transfer of funds by the bank to the trading enterprise).

Consumer credit can be provided in a cashless form by transferring the amount to the borrower's current account or paying his settlement documents transferring funds to the seller's current account.

According to the terms of the loan agreement, the borrower repays the loan once a month in equal installments and pays interest for using the loan: by depositing cash at the bank's cash desk or in a cashless form by the client's order.

If the customer has not made the next payment within the term established by the loan agreement, the responsible employee of the department finds out the reasons of the situation and conducts work on the loan repayment.

Thus, consumer lending in Ukraine is developing rapidly, commercial banks take foreign experience as an example and create new credit schemes and credit rules. Overcoming the problems of consumer credit insurance is of interest to everyone, including large producers of goods for the population and wholesale trade organizations, since it has the advantage of a large insurance field and the continuity of lending.

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LEGAL REGULATION AT MODERN AGRICULTURAL ENTERPRISES

In the process of recovery and economic development of the state it should be developed a clear plan of action which will be clearly defined to the basic sectors of the economy allowing development of the new economic activities. In Ukraine, among all basic areas, which can be used for rapid economic growth, is the agricultural sector. Enterprises of the agricultural sector, as well as other companies have their own legal basis of functioning that are registered on the national and local level, and they are fully covered by the agrarian law.

Agrarian legislation such as an independent branch of Ukraine and law is a set of regulations governing agricultural relationship. Agrarian law is an inherent complex. That is because the agricultural sector is functioning the complex of social relations governed by different areas of law: civil, land, labor, administrative, cooperative, financial and other. However, that relationship would not refer to the farmer, that must take into account and reconcile this relationship with the possibility of using land, considering the risk of agricultural activity, which is due to objective factors and does not depend on the person (weather and climatic conditions, natural disasters), long break between the process of work and its results, the slow circulation of capital, seasonality and other works. That is, all the factors that caused specific agricultural production. The specificity of agriculture is the main objective factor that causes concern in a secluded state regulation of agrarian relations, found in numerous agricultural legislation.

Laws and regulations make agricultural legislation aimed at ensuring the sustainable use of agricultural land, the organization and conduct basic, additional and ancillary sectors of agriculture, acts aimed at regulation and health and safety of workers at agricultural areas, compliance with safety and health regulations in the process of agricultural production.

Of course, the basic principles determining the general powers of industrial and economic groups, including farms, are formulated in the Constitution of Ukraine. It has the highest legal effect, and all the laws and regulations adopted in the state, must conform. It embodied the fundamental rules relating to state structure, competence of the state in regulating economic activity in general and agricultural production in particular. Providing the Constitution of the rights, freedoms and duties of citizens were fully distributed among agricultural workers.

The Economic Code of Ukraine defines the general terms of business entities of all forms of property, the order of their establishment, reorganization and liquidation. Regarding agriculture, these provisions relate to state farms, stud farms and enterprises engaged in logistics, repair and maintenance services and other agricultural enterprises.

The Land Code of Ukraine stated on 25.10.2001 p. is one of the most important sources of agricultural law, because the land is the main means of production, and implementation is impossible without agricultural activity. Standards Code establishes ownership of land; the competence of state bodies in the field of land law defined the procedure for granting land ownership and use, procedure and grounds for termination of ownership and use of established types of agricultural land and the rights of owners and users. Land Code establishes the legal regime of agricultural land, the responsibility for violation of land legislation.

The Tax Code of Ukraine significantly reduced the amount of tax payments for farmers. Its payers are agricultural enterprises of different legal forms, including and farms. Taxpayers have the right to choose the system of taxation.

The agricultural law, occupying a special place, acts at local authorities and local governments. Almost all the regions of Ukraine have their own climate and agricultural production characteristics. In addition, distribution of industry and agricultural production is uneven. These circumstances influence the nature, content and direction of agricultural production. Such local issues are resolved by the local authorities. Indeed, in the course of operations, a number of issues that should be provided through dialogue with the landowners, local authorities and central government, result in the implementation of organizational, economic and legal measures:

- giving farmers the right of free choice of the economic activity direction;
- full ownership of their work results;
- changes in state investment policy;
- channeling investment in mechanization, use of chemicals processing industry,construction industry for agriculture;
- products parity pricing;
- regulating relations of agricultural producers and the state with the help of funding, lending, taxation;
- preparing and training specialists for agriculture.

It should be noted that on farms there are local regulations that directly or indirectly affect the resolution of the aforementioned issues. By their nature, local regulations governing the issue of the independence of the industrial, financial and economic activities at agricultural enterprises. In addressing these issues, a great role is devoted to farm regulations.

Thus regulating activity of modern farms needs significant optimization for top actions and improving the dynamics of agricultural development in Ukraine.

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UDC 657

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DEBATABLE ISSUES OF CALCULATION AND PAYMENT PROCEDURE OF PRENATAL AND MATERNITY ALLOWANCE: ACCOUNTING ASPECT

A salary is the basic source of employees' income. Payroll accounting requires the reliable documentary reflection of working time, products manufactured, services provided and their payment. Issues of payroll accounting are one of the most topical in the system of accounting of an enterprise. The proper organization of accounting employees' payments promote an effective management and control of efficient labour resources using. The special attention is deserved by questions related to peculiarities of calculation and payment procedure of prenatal and maternity allowance.

More than 120 countries around the world provide paid maternity leave and health benefits by law, including most industrialized nations except Australia, New Zealand and the United States, says a new report Maternity protection at work by the International Labour Office (ILO).

The countries that provide the most paid maternity leave by law include: the Czech Republic – 28 weeks; Hungary – 24 weeks; Italy – 5 months; Canada – 17 weeks; Spain and Romania – 16 weeks each. Denmark, Norway, and Sweden all provide extensive paid leave which may be taken by either parent, although a portion is reserved for the mother.

Ukrainian legislation protects pregnant women from loss of income by providing the maternity allowance. It is provided to the insured person in the amount of 100 % of the average earnings. The upper limit of monthly sum of the insurance maternity allowance must not be more, than maximum value of base of charging single fee for compulsory state social insurance. Minimum maternity allowance is equal to minimum wage. The insurance maternity allowance will be calculated on the basis of accrued wages per month but no more than double minimum wage and no less than minimum wage per month, if women's length of insurance is less than 6

month. The insurance maternity allowance is paid during the whole period of the maternity leave (126 or 140 calendar days).

The parental leave is available for workers with children up to the age of three years. The parental leave may be provided for up to the maximum of 6 years if a child requires a longer permanent care based on medical conclusions. The parental leave is also available for guardians, adoptive parents, grandmother, grandfather or other relatives who actually takes care of a child. These categories of employees may work part-time or work from home during parental leave. The company may provide such workers with partially paid or unpaid parental leave of a longer duration.

As the result of the analysis of legislative base, magazines and scientists' works, range of issues concerning calculation and payment procedure of prenatal and maternity allowance has been defined.

Their characteristics are the prospect of our further investigations and will be discussed in detail in furhter works.

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PERCULIARITIES OF STAFF AUDIT TECHNOLOGY AT ENTERPRISE

The unstable political situation, which is being observed in Ukraine, the changes in the credit and financial system, reducing the investment appeal of enterprises, unfavorable demographic trends affecting the required level of companies' personnel providing are the external factors that determine the conditions of the enterprise's functioning. The management of the companies, unfortunately, fails to reduce their negative impact on the effectiveness of their activity, but they must take it into account while forming their strategies and systems of staff audit as its integral part. Imperfect control mechanism, characteristic for Ukrainian companies, which does not meet modern requirements, is outdated and ineffective. Being a factor of an internal environment, therefore, such a mechanism is in the range of control of the management, that is, its impact can be adjusted in the direction desired for enterprises.

The staff audit is one of the most relevant methods of quality control of socio-labor processes at the enterprise. It is also necessary to evaluate the effectiveness of the staff management and helps identify the errors that can cause financial losses and damage the reputation of the company. The staff audit aims at the formation, development and personal growth of employees, and therefore, at the increase of the personnel independence of the company.

However, it should be noted that the staff audit is a fairly new area, so it naturally has a number of shortcomings in its functioning. In particular, it concerns the lack of methodological basis. Ukraine has a shortage of domestic specialized literature, especially, more detailed manuals on the staff audit, which creates a certain niche in forming its methodology and requires scientifically grounded theoretical developments in this area and their practical implementation. Thus, the question of staff audit technology in crisis needs proper attention and is very important nowadays.

The summaries of domestic and foreign experts' studies have made it possible to develop the technology of staff audit, which is a sequence of steps, a set of tasks and procedures of performing the staff audit subsystems in the social and labor sphere. Due to the analysis, the following seven stages of planning staff audit have been allocated:

- the preliminary assessment of staff audit terms;
- the development of the audit plan;
- collecting and preparing the information for the analysis;
- the analysis of audit data and preliminary evaluation of staff audit results;
- the final evaluation of the results obtained;
- the prior preparation of the audit report;
- the presentation of the audit report.

Preliminary assessment of the conditions of the staff audit includes: collecting general information (introduction to the company, its main activities, socio-economic conditions of operation, strategic objectives and their relationship with the policy of staff management); preliminary diagnosis of the social and labor issues and identification of possible problems; developing preliminary audit plan; discussing it with the client; determining audit "team"; discussing the strategy and preparing for the audit. The main task at this stage is to obtain an adequate assessment of the possibility of the staff audit at the company, which can be ensured by having sufficient knowledge of the economic conditions of the enterprise, its place in the market of goods and services, of major internal and external factors influencing both the level of a financial economic situation of the company and the level of social and labor issues within the object of the audit.

The development of the audit plan presupposes the sequencing of actions of the auditor and usually includes:

- the identification of the object, purpose and objectives of the audit investigation; developing the audit program that involves determining the number and responsibilities of auditors, the schedule of their work, the time spent on certain types of inspections; the detailed description of audit procedures that is both instructions for employees involved in auditing and control tool of the accuracy of the performance;
- the development of system of indices by which each object of the analysis will be explored;
- setting the sequence and frequency of the audit; the description of the ways of the study;

- budgeting of the audit activity (planning of funds allocated for the organization of the audit).

The overall audit plan should be a guide for the implementation of the staff audit program, which is a detailed list of the contents of audit procedures necessary for the practical implementation of the audit plan.

The implementation phase of collecting and preparing the information for the analysis includes the identification of the information base and its sources; the development of questionnaires, interview forms, etc.; the collection and preparation for the analysis of the necessary information. The main areas (within which it is supposed to collect the necessary information) are presented in the scheme of the audit analysis of social and labor sphere, based on generalization and analysis of the materials of specialized literature devoted to the study of social and labor indicators. The following seven major subsystems are proposed to be included in such a scheme: "Staff", "Working Time", "Work Standardization And Organization", "Labor Impact", "Salaries And Remuneration", "Work And Social Security Conditions", "HR Management Activities" and the integrated block "Economic Effectiveness Of Social And Labor Sphere."

At this stage, information is gathered on such indicators as the number of industrial personnel, the fund of working time, etc., which are basic to determine estimated figures. In addition, the definition of these indicators as basic is done due to the fact that the figures in this category are most present in the primary accounting documents and reporting forms locally developed for each company.

The analysis tools of the audit information and preliminary evaluation of results of the staff audit involve grouping methods, decomposition, synthesis parameters, the determination of average or relative quantities and others. It is advisable to implement the stage of the preliminary assessment of audit results in the following order:

- characteristic of changes of accounting rates related to planned, basic and standard indicators of performance;
- the analysis on changes and deviations of parameters which subject to social and labor audit;
- the assessment of the damage caused by the factors that affect negatively;
- the determination of the social and labor risks and ways to reduce them.

It is necessary to find out in the course of the audit analysis:

1) the reason of deviation that can include a mistake in the calculations, carelessness, personnel misunderstanding of regulations, deliberate distortion, problems in personnel management etc.;

2) the frequency of deviation if this deviations is systematic, or incidental;

3) the impact of the deviation: how much significant this deviation is and how it will influence upon the economic condition of the company.

Due to the analysis of the deviations revealed and the interpretation of their causes the auditor can determine the extent of social and labor risks and provide recommendations for updating and aligning of social and labor indicators and phenomena according to laws and regulations, as well as to the objectives and the strategy of the company.

The fifth stage of the staff audit is related to the final evaluation of the results obtained. The auditor conducts the summarizing of the staff audit results, calculates the reserves of increasing the efficiency of the subsystems of social and labor spheres and possible risks and determines the final level of efficiency of social and labor sphere.

The prior preparation of audit opinion provides, first of all, the discussion of its key findings with the managers at all levels of management (line managers, experts in HR management, HR managers), and, if necessary, with specially invited experts, to develop mutual recommendations on the directions of rational use of the results of the audit.

The last stage of the staff audit is presenting the audit summary. The auditor's report in this case gives the assessment of the accordance of all the significant aspects of the mechanism of management of subsystems of social and labor sphere to legally established standards and criteria developed locally at the enterprise level.

Thus, it should be noted that the technology of staff audit should be divided into seven successive stages with the implementation of the described above objectives and usage of the suggested procedures; setting of goals and objectives of the stuff audit; the evaluation of the existing environment and the subject of inspection; the choice of strategy and its implementation; drawing up a general audit plan; the selection and specification of the staff audit procedure; staff audit program development; staff audit general plan and program adjustment. This would allow to include in the staff audit not only basic components, but also some structural elements through which the full essence of the staff audit technology is revealed.

UDC 331

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INCENTIVE PAYMENT AS A METHOD FOR IMPROVING WAGES

Wages are the main source of workers' income at companies, enterprises and organizations. Payroll and payment take a special place in the work of each enterprise. In a market economy there have been significant changes in payment.

Wages became an important means to improve the workers' interest in the results of their labour and their productivity, also increase of output, improvement of the quality and variety of goods.

The practice of economic activity in the country has developed various incentive systems for usage in specific production conditions either separately or combining different systems. [4, c.18]

1. Systems that coordinate basic wages with the level of performance and over fulfilment of labour indicators which exceed the limit of worker's labour standards. They include various bonuses for achieved results. [3, c.108]

These types of encouragement are the most common as we can embrace more workers . Besides they usually have distinctive quantitative parameters which enable to control the level of wages both for the most employees and their supervisor. Moreover, if these types of encouragement are known in advance to the employees, it allows them to use their material interest purposefully, individually or together with others to achieve the level of earnings that satisfy them. [1, c.123]

2. Systems that coordinate basic level of wages with the personal qualifications of the worker, his level of professional skills and personal qualities, attitude to work. First of all these are incentive bonuses and allowances of different kinds depending on professional skills; combination of professions (positions); extension of rate (zones) of services; performance of previous or larger volume of works (services) by lower number of employees [3, c.129]

3. Systems that coordinate basic salary of the employee or group of employees with certain achievements that are not systematic or with any general collective results of work within a certain, relatively long calendar period (semester, year).

These are different one-time bonuses and rewards. They are paid by some companies even now, for the performance of especially important production tasks, for the special achievements in the manufacturing competition, for the results of the company within a year (half, quarter) and so on [2, c.215].

A distinctive feature of these types of secured promotion is their flexibility. They usually do not become a mechanical increase in salaries. At the same time, they do not mean any employer's obligations to employees. One promotion often cause a favourable reaction in staff and ultimately almost always are beneficial (except, perhaps, the annual remuneration to be pretty well thought out and organized to the employee during the year actively worked on high end results). [4, c.35]

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ANALYSIS AND PROSPECTS OF DEVELOPMENT OF CASHLESS SETTLEMENTS IN UKRAINE

Monetary settlements can take both cash and cashless forms, the latter, as a rule, are preferred. It is explained by the fact that when using cashless settlements significant cost savings for their implementation are achieved.

Cashless settlements refer to the transfer of a certain amount of funds from the payers' accounts to the recipients' accounts, as well as the funds transfers to the recipients' accounts executed by banks upon instructions of enterprises that have deposited cash at the bank's cash desk.

The peculiarity of non-cash turnover in Ukraine is the use of the special organization of the form of implementation of the payment itself. The structure of settlement forms provides for the establishment of a specialized system of cashless settlements as a form of organizing the movement of money on accounts in banks. In cashless settlements money functions as a means of payment. The organization of cashless settlements must meet certain requirements. It should:

– contribute to the normal turnover of funds;

– ensure a continuous progress of sales of products and services;

– help to make timely payments and control compliance with the terms of obligations [2].

According to the statistics of the company MasterCard Ukraine ranked third in Europe in terms of increasing the number of transactions by plastic cards. In turn, the government and the regulator also took the course to the cashless economy and presented the strategy for reducing cash settlements in the country until 2021. This concept is based on four main areas of work:

– reduction in demand for cash;

– development of cashless payments;

– infrastructure development;

– changing habits of people as part of financial awareness.

Today more than 80% of all consumer payments in the world take place in cash. However, the share of cashless settlements is constantly growing. For instance, in Ukraine cashless settlements are about 53% of all payments in economic turnover. According to the NBU, during 2015 the CR CSC system processed more than 115 thousand interbank transactions worth about 63 million UAH. In 2015 in comparison with 2014 the total growth was as follows: by the amount of processed transactions – 2 376,81%, by the number of processed transactions – 3 064,64% [1].

Cashless settlements with the use of payment cards continued to develop actively. Thus, in comparison with 2014, in 2015 the volume of transactions carried

out with the use of payment cards issued by Ukrainian banks grew by 21,0% and reached 1 233 billion UAH. The number of operations with the use of payment cards issued by Ukrainian banks increased by 24,9% – to 1 965 million transactions [1].

Certainly, the transition to the cashless system has a number of advantages for each Ukrainian separately, but it will also have a positive effect on the country as a whole. First of all it is:

– improvement of the banking sector;

– decrease in the level of the shadow economy;

– development of the IT sector of Ukraine;

– stimulation of GDP growth;

– growth of revenues to the state budget;

– attraction of additional resources for lending to the economy [2].

Thus, the effect of transition to the cashless system will have a rather positive impact on the economy of the country. Therefore, we recommend the introduction of activities aimed at reducing the use of cash and popularization of cashless settlements. These activities are:

– development of financial infrastructure for convenient and safe implementation of cashless transactions throughout the country;

– development of the financial literacy of the population (the process of familiarization of the population with personal and social benefits of a cashless society, which gives priority to the national currency, must be permanent and conducted in an understandable and accessible way);

– conducting seminars, workshops, lectures on preventing fraud with payment cards and electronic wallets;

– informing the population about innovative forms of cashless settlements and familiarizing with their work;

– stimulating IT developers to create new technological products of the world level;

– stimulating IT developers to create systems of information security and fraud prevention.

The development and organization of cashless settlements is the most important prerequisite for the stable development of the national economy. It directly applies to our country, as it is necessary to create an effective mechanism for implementing cashless settlements between various economic entities. The transition from cash to cashless forms of payment is the basis for the formation of a transparent financial system of the state. It happens by reducing the level of the shadow economy which will result in increasing revenues to the state and local budgets of Ukraine, which is an extremely positive factor.

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STANDARD COSTING: ADVANTAGES AND DISADVANTAGES

The basic function of management accounting is to facilitate the managerial control in a business unit or organisation. Management control is the process of evaluating performance and applying corrected measures, if required, so that performance takes place according to plans. The major aspect of managerial control is cost control. And the "standard costing" is that technique which helps management to control costs and business operations. It aims at eliminating wastes and increasing efficiency in performance through setting up standards or formulating different cost plans [1, c. 163].

The research and study of the method standard costing, its advantages and disadvantages have been worked out by such scientists: H. Harrison, T. Downey, G. Emerson, V. E. Kerimov, R. S. Kaplan and others.

Standard costing is a technique of cost accounting which compares the standard cost of each product or service with actual cost to determine the efficiency of the operation so that any remedial action may be taken immediately. The terminology of cost accountancy defines standard costing as "the preparation and use of standard costs, their comparison with actual costs, and the analysis of variance to their causes, and points of incidence" [1, c. 164].

Standard costing is a management accounting tool used in management decision making to allow better cost control and optimal resource utilization. When there are variances between the standard and actual costs, the reasons for them should be researched, analyzed and remedies should be introduced by the management to ensure the variances are minimized in the next accounting period [3].

Further, it is a system of cost accounting, which is designed to find out how much should be the cost of a product under the existing conditions. The actual cost can be ascertained only when production is undertaken. The predetermined cost is compared to the actual cost and a variance between the two enables the management to take necessary corrective measures.

The technique of standard costing involves the determination of cost before occurring. The standard cost is based on technical information after considering the impact of current conditions. With the change in condition, the cost also can be modified so as to make it more realistic. The standard cost is divided into standards for materials, labour and overheads. The actual cost is recorded when incurred. The standard cost is compared to the actual cost. The difference between the two costs is known as variance. The variances are calculated element wise. The management can take corrective measures to set the things right on the basis of different variances.

The basic purpose of standard costing is to determine efficiency or inefficiency in manufacturing a particular product. This will be possible only if both standard

costs and actual costs are given side by side. Though standard costing system will be useful for all types of commercial and industrial undertakings but it will be more useful in those undertakings where production is standardized. It will be of less use in job costing system because every job has different specifications and it will' be difficult to determine standard costs for every job [1, c. 165].

The establishment of a standard costing system involves the following steps:

- Determination of cost centre. A cost centre may be a department or part of a department or item of equipment or machinery or a person or a group of persons in respect of which costs are accumulated and one where control can be exercised. Cost centres are necessary for determining the costs.
- Classification of accounts. It is necessary to meet a required purpose i.e. function, asset or revenue item. Codes can be used to have a speedy collection of accounts. A standard is a predetermined measure of material, labour and overheads. It may be expressed in quantity and its monetary measurements in standard costs.
- Types of standards. The standards are classified into three categories:

- current standard. A current standard is a standard which is established for use over a short period of time and is related to current condition. It reflects the performance which should be accomplished during the current period. The period for current standard is normally one year. It is supposed that the conditions of production will remain unchanged. In case there is any change in price or manufacturing condition, the standards are also revised. Current standard may be ideal standard and expected standard (ideal standard represents a high level of efficiency and it’s fixed on the assumption that favourable conditions will prevail and management will be at its best; expected standard is based on expected conditions and it is the target which can be achieved if expected conditions prevail).

- basic standard. A basic standard is established for use for an indefinite period or a long period. These standards are revised only on the changes in specification of material and technology production.

- normal standard. Normal standard is a standard which is anticipated can be attained over a future period of time, preferably long enough to cover one trade cycle. This standard is based on the conditions which will cover a future period, say 5 years, concerning one trade cycle. If a normal cycle of ups and downs in sales and production is 10 years then standard will be set on average sales and production which will cover all the years.

- Organisation for standard costing. In a business concern a standard costing committee is formed for the purpose of setting standards. The committee includes production manager, purchase manager, sales manager, personnel manager, chief engineer and cost accountant. The cost accountant acts as a coordinator of this committee. He supplies all information for determining the standard and later on coordinates the costs of different departments. He also informs the committee about the change in price level, etc. The committee may revise the standards in the light of the changed circumstances.
- Setting of standards. The standard for direct material, direct labour and overhead expenses are fixed. The standards for direct material, direct labour and

overheads should be set up in a systematic way so that they can be used as a tool for cost control easily [1, c. 171].

Steps in standard costing are the following:

1. Determining standard costs for the unit. This is achieved by reviewing in detail the processes and inputs that are required to produce a unit.

2. Agreeing the budgeted sales price of each unit. This may be determined by using the standard cost per step 1 as the baseline for cost plus mark up based pricing.

3. Preparing budgets for each budgetary period (normally one year), which are typically broken down into shorter term budgets (normally monthly). This aids the short term control.

4. Recording actual costs and revenues for each short term control cycle.

5. Preparing an operating statement that reconciles the actual and budgeted cost/profit for each control cycle. The differences will be reported as variances.

6. Investigate the reasons for the occurrence of significant variances.

7. Identify and agree the control actions required to correct adverse variances and accentuate favourable variances.

8. Implement and monitor the results of the control actions instituted per step 7 [4].

Standard costing is not only helpful for cost control purposes but it is also useful in production planning and policy formulation. It derives many advantages: measurement of efficiency, production and price policy formulation, management by exception.

Measurement of efficiency is a tool for assessing the efficiency after comparing the actual costs with standard costs to enable the management to evaluate performance of various cost centres. Production and price policy formulation becomes easy to formulate production plans by taking into account standard costs. As for management by exception it means that everybody is given a target to be achieved and management need not supervise each and everything. The responsibilities are fixed and every body tries to achieve his targets and management by exception is possible only when targets of work can be fixed. Standard costing enables the determination of targets [1, c. 168].

Besides all the above benefits derived from this system, it has a number of limitations: standard costing cannot be used in those concerns where non-standard products are produced; the time and motion study is required to be undertaken for the process of setting up standards; there are no inset circumstances to be considered for fixing standards; this system is expensive and small concerns may not afford to bear the cost; this system will not be useful for industries where methods and techniques of production are fast changing [1, c. 170].

So, from the above we can conclude that standard costing has its advantages, and certain disadvantage. Therefore, this system will be useful for industries where methods and techniques of production do not change very quickly.

Standard Costing is a cost accounting technique, which helps to measure the performance of material, labour and overhead and report the variances, to take corrective actions. The variances are being analysed in detail and reported by

comparing the actual costs with the standard cost for actual output along with determining the reasons for the same [2].

Standard costing is a management tool that is used in organisations to improve many key management processes including:

- understanding and determining unit costs;
- arriving at cost plus prices budgeting revenues;
- costs and expected profits/contribution;
- planning resource inputs such as direct materials and direct labour;
- reporting performance;
- controlling performance variances [4].

Standard costing can help organisations make best possible use of the resources. In addition to this, the management can keep a check on the organisational activities by assessing the deviations, i.e. analysing the difference between actual performance and the standard performance.

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SOCIAL, ECONOMIC, POLITICAL AND TECHNOLOGICAL ASPECTS THAT WILL AFFECT BUSINESS IN EUROPE IN FUTURE

The economic activity of the enterprise, ie its business and market activity plays a key role in today's dynamic economic conditions. External environment factors can be seen as opportunities and threats for the company, their positive or negative impact on the organization will depend on management efficiency and adaptability of the company. Therefore, the main task of the management of each company is a thorough study of the behavioral influence of external factors on the economic viability of the unit, the timely determination on the most significant external factors and optimization of their impact on the company. The external factors include the following:

1. Political factors are determined by the political situations, the stability of society, from all others depend Foreign investment attitude of government to the state of the real economy.

Political risk - the risk of deterioration of the political climate in the country, resulting in the state as a whole and individual enterprise in particular suffers direct financial losses and deteriorating living standards.

2. Economic factors - economic growth, employment, inflation.

These factors involve changes in the global economy. A rise in living standards would ultimately imply an increase in demand for products thereby, providing greater opportunities for businesses to make profits.

3. Scientific and technological factors create enterprises for further development and Opportunity Getting advantage over competitors.

These factors greatly influence business strategies as they provide opportunities for businesses to adopt new innovations, and inventions. This helps the business to reduce costs and develop new products.

4. Social factors allow determine of specific features activities (Between the highest value, and middle and lowest layers of the population, life values of people, traditions, etc.).

These factors are related to changes in social structures. These factors provide insights into behaviour, tastes, and lifestyles patterns of a population. Buying patterns are greatly influenced by the changes in the structure of the population, and in consumer lifestyles. Age, gender, etc all determine the buying patterns and understanding of such changes is critical for developing strategies which are in line with the market situations.

Understanding of these factors is important while developing a business strategy.

This year's World Economic Forum was held from 20 to 23 January in Davos, Switzerland. On the agenda were the fluctuations in the stock markets, Falling prices for oil, solving migration problems and the new industrial revolution. It was about the fourth industrial revolution, the development of world science and influence of technical means on people life. World Economic Forum called fourth industrial revolution tsunami technological advances that transform the economy. "Automation and Communication lead to all industrial revolutions, but never at such a high level of intensity as now. These two forces will have very different consequences for nations, enterprises and individuals." / Axel Weber, chairman of the Swiss Chairman of the Board largest financial holding UBS/. The fourth industrial revolution characterized fusion technology and erasing boundaries between phisical, digital and biological areas. Robotics work in the next decade can be a mass thing and leave millions of people without work.

The forum identified four main risks for the global economy coming years "triple loop" China (transition from industry services, return to the domestic market and stimulate consumption); discounted prices for raw materials; asynchronous

process in monetary policy; capital flight from countries that develop to countries that already developed

At the end of 2015 World Health Organization published a report, according to it till 2050, the number of people age 60 years, will doubled and reached 2 billion. This fact completely turn the structure of the global economy and social security.

Among the global economic, environmental, geopolitical, social and technological risk, considered the biggest challenge for the twenty-first century climate changes which will lead international and civil wars in next 50 years.

Where we can get the most complete information about the future of Europe? One of the most useful source is a strategy "Europe 2020" developed in the 2010.

According to this strategy key objectives for the European Union is the implementation of such a plan by 2020:

– 75 % of the population aged 20-64 should be employed;

– 3% of the EU's GDP should be invested in R&D;

– The "20/20/20" climate/energy targets should be met (including an increase to 30% of emissions reduction if the conditions are right);

– The share of early school leavers should be under 10% and at least 40% of the younger generation should have a tertiary degree;

– 20 million less people should be at risk of poverty.

For achieve these goals the strategy also includes the following measures:

– "Innovation Union" to improve framework conditions and access to finance for research and innovation so as to ensure that innovative ideas can be turned into products and services that create growth and jobs.

– "Youth on the move" to enhance the performance of education systems and to facilitate the entry of young people to the labour market.

– "A digital agenda for Europe" to speed up the roll-out of high-speed internet and reap the benefits of a digital single market for households and firms.

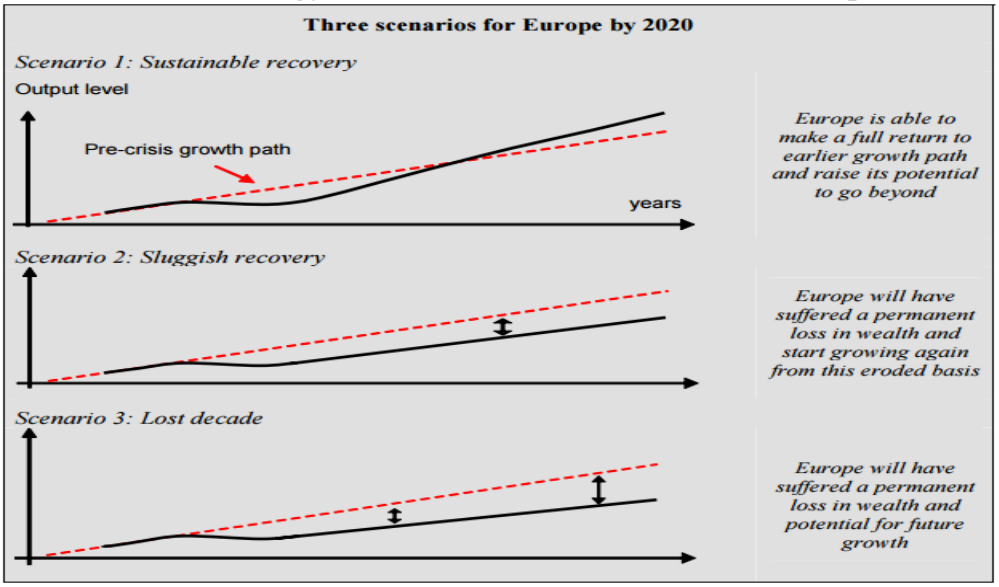
– "Resource efficient Europe" to help decouple economic growth from the use of resources, support the shift towards a low carbon economy, increase the use of renewable energy sources, modernise our transport sector and promote energy efficiency.

– "An industrial policy for the globalisation era" to improve the business environment, notably for SMEs, and to support the development of a strong and sustainable industrial base able to compete globally.

– "An agenda for new skills and jobs" to modernise labour markets and empower people by developing their of skills throughout the lifecycle with a view to increase labour participation and better match labour supply and demand, including through labour mobility.

– "European platform against poverty" to ensure social and territorial cohesion such that the benefits of growth and jobs are widely shared and people experiencing poverty and social exclusion are enabled to live in dignity and take an active part in society.

Also in the strategy described three scenarios for Europe for 2020.



According to this strategy Europe must act:

– Innovation: R&D spending in Europe is below 2%, compared to 2.6% in the US and 3.4% in Japan, mainly as a result of lower levels of private investment. It is not only the absolute amounts spent on R&D that count – Europe needs to focus on the impact and composition of research spending and to improve the conditions for private sector R&D in the EU. Our smaller share of high-tech firms explains half of our gap with the US.

– Education, training and lifelong learning: A quarter of all pupils have poor reading competences, one in seven young people leave education and training too early. Around 50% reach medium qualifications level but this often fails to match labour market needs. Less than one person in three aged 25-34 has a university degree compared to 40% in the US and over 50% in Japan. According to the Shanghai index, only two European universities are in the world's top 20.

– Digital society: The global demand for information and communication technologies is a market worth € 2 000 billion, but only one quarter of this comes from European firms. Europe is also falling behind on high-speed internet, which affects its ability to innovate, including in rural areas, as well as on the on-line dissemination of knowledge and on-line distribution of goods and services.

Social factors such as increased level of education provide training to future professionals of different industries. As a result of higher employment will lead improvements of life level and after it will be new potential customers, that will be good on demand. The fight against poverty, it will also result in a more favorable external environment for business. Doubtless, economic aspects are one of the most important for effective doing business. Help Small business will open for it more possiblities and simplify formalities and as a result small business will develop rapidly. Political factors also are key, opening new frontiers for product promotion through the New members of the European Union will have both positive and negative sides for European enterprises. On the one hand it is a new market, new consumers, but the other side of the coin is, also new competitors. Technological

progress can give impetus to more efficient and attractive, by minimizing the costs of doing business.

The EU is a good place to do business. Rapid technological developments, open and expanding global markets, and ever-increasing access to information mean that regulation is under constant review and is being adapted to keep pace. Indeed, EU member states have been improving regulations and, on average, rank 31st among 189 economies. One-third of the top 20 countries in the world for Doing Business are European, and practically all EU countries are in the top 50.

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PROBLEMS OF BANK CREDITING OF AGRARIAN ENTERPRISES

In modern conditions enterprises of agrarian sphere increasingly require financial resources for updating their material and technical base, introducing innovative technologies and constructing new objects. Loan funds are the necessary source of financing for enterprises of agrarian sphere, but unsatisfactory financial condition of many agrarian enterprises, insufficient credit security required by banks, absence of positive credit history complicate, and in some cases, make getting bank loans impossible.

Nowadays due to the global financial crisis Ukrainian banks have found themselves in a difficult situation. The need to return the borrowed from abroad funds, which have already been distributed as long-term loans, makes banks and the state itself take measures to ensure the financial viability of the Ukrainian banking system. It happens because of the lack of other sources of financing. Banks have not adjusted their policies and have not taken effective measures to minimize the impact of the crisis on time, and now they expect to compensate for losses at the expense of the state and their customers. Banks are experiencing the crisis of liquidity; they need money which they try to attract by all possible methods. The arsenal of means and the ingenuity of bankers are impressive – they increase interest rates on loans granted, do

not return deposits both ahead of schedule and after the deadline, delay payments, require additional payments and so on.

Crediting of agricultural enterprises by commercial banks in modern conditions has become more complicated due to their insufficient profitability, low return on invested capital and low liquidity of property. The existing credit system is oriented to profitability in industries with relatively high capital turnover. The offered interest rates and conditions do not allow agrarian enterprises to be full participants in the market of credit resources. Under market conditions agricultural production will not function effectively without raising funds. Difficulties in selling products and the reduction of the volume of state budget support have aggravated the need for lending to agricultural enterprises.

One of the major problems existing today in agriculture is the lack or shortage of funds for replenishing working capital and updating basic means of production. The development of the system of credit servicing in the agrarian sector of the economy is hampered by the unregulated nature of such issues as depreciation of fixed assets, a lengthy procedure for obtaining a bank loan, inaccessibility of small and medium-sized enterprises to financial services, high interest rates [1, p. 12]. Banks are primarily interested in profits and such conditions which will ensure the least risk. But not all agricultural enterprises are in a satisfactory financial condition and fully meet the requirements and wishes of bankers. Government support is of great importance to the development of agricultural production. Today its mechanism is ineffective and it does not allow satisfying all the needs of farmers.

Domestic commodity producers of the industry experience an increased need for credit funds, which are now an important source of recovery of the lost working capital and fixed capital. Thus, enterprises face difficulties of obtaining even a small loan amount due to lack of collateral. A large number of documents required for obtaining a loan and a long period of their consideration also cause the low level of access to loan resources. In addition the main factors limiting the attractiveness of the agrarian sphere of Ukraine for credit provision are the low level of creditworthiness of agricultural commodity producers and the lack of acceptable credit provision. The high level of depreciation of fixed assets (70-80%) and moral obsolescence testify to their inability to be a highly liquid collateral object. The only way out in this situation can be the use of land as collateral for the loan. However, in this case, financial organizations refuse to enter into credit relations with agricultural enterprises because these enterprises are often unable to pay their own workers and they divide the land into shares in order to retain employees and continue activities [2, p. 89].

An important issue in crediting the agricultural production is the level of repayment of granted loans. The main reason for the non-return (or untimely return) of loans is lack of income due to problems with selling products, high interest rates and in some cases ineffective use of credit funds.

It also should be noted that the abilities of banks to recover problem and bad debts are limited due to imperfection of the legislative framework. Therefore, they compensate high credit risks of enterprises by high interest rates and strict requirements to borrowers.

The development of credit relations of agricultural enterprises with commercial banks largely depends on improving their creditworthiness and liquidity of collateral for loans. One of the major problems in the sphere of crediting is a limited number of objects that borrowers can provide as collateral. The main directions for stabilizing the mechanism for lending to agricultural enterprises are taking measures on the part of the state and the banking system aimed at developing an effective integration mechanism for interaction with the agricultural sector of the economy; increasing the volume of financial support for agricultural enterprises through the mechanism of cheapening of loans; development and application of all possible sources for raising capital when lending to agriculture (rational use of budgetary funds, increasing budgetary allocations, attracting foreign loans, creating at their expense mechanisms of state, bank or mixed lending).

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THEORETISCHES WESEN OUTSOURCING VORTEILE UND NACHTEILE

In der wissenschaftlichen Literatur werden Perioden der Entstehung und der Entwicklung Outsourcing zweideutig interpretiert, sowohl in der internationalen und inländischen Maßstab. Diese Situation wird, unserer Meinung nach, durch die Anwesenheit von mehreren Varianten der Interpretation des Begriffs "Outsourcing" gebildet.

Der Begriff "Outsourcing" hat den englischen Ursprung und bedeutet "die Verwendung von externen Ressourcen." Bis zum Anfang 90er Jahren des XX. Jahrhunderts wurde der Begriff "Outsourcing" nicht anwesend.

J. B. Haywood glaubt, dass der alte Name von "Outsourcing" der Begriff "Externalisierung" ist. Seiner Meinung nach ist beschreibt dieser Begriff die Aktivitäten, in denen die Organisation keinen Kernfunktionen für Unternehmen sendet, die in diesem Bereich spezialisieren haben. Ein Werk von Anikin B. A. erwähnt auch den Begriff "Externalisierung" als die "Übertragung der Kontrolle über

die Ausführung einer beliebigen Funktion der Firma, die in diesem Bereich spezialisiert. "Der Begriff "Outsourcing" besteht in den internen Prozessen, Aufgaben oder Projekten an externen Diensten.

In der modernen wissenschaftlichen Literatur gibt es viele verschiedene Definitionen der Bedeutung von "Outsourcing". Im Zuge der Analyse wurden vier grundlegende Ansätze identifiziert: 61% der Autoren betrachten dieses Konzept wie die Übertragung der Außenorganisation, 25% - wie die Beteiligung von der Außenorganisation, 8% - wie die Integration der Organisationen und 6% - wie die Optimierung der Organisation.

Betrachten wir nähere Ansätze gründlicher:

1) Ansatz der "Transferprozess externe Organisation" bedeutet hauptsächlich in der wissenschaftlichen Literatur, Transferprozesse, Funktionen, Rechte oder Geschäftstätigkeit. Die Autoren dieses Ansatzs unterscheiden verschiedene Gruppen von Objekten für die Übertragung zum Outsourcing. In der Gruppe gibt es die Prozesse, Funktionen, Aufgaben, Dienstleistungen und Arbeiten. Andere Autoren identifizieren solche Objekte der Übertragung wie Personalabteilung, IT-Asset-Fähigkeit, Führungsverantwortung, Recht und Geschäftstätigkeit.

J. B. Heywood glaubt, dass Outsourcing ein Übergang von interner Abteilungen und alle damit verbundenen Vermögenswerte in die Organisation des Service-Providers, ist der einen Dienst für einige Zeit zum vereinbarten Preis zu liefern bietet. Ayvazyan Z.S. versteht, dass Outsourcing die Übertragung bestimmter Support-Funktionen an einen Dritten Person ist, die in diesem Bereich spezialisiert.

2) Der Ansatz "mit externen Organisationen" bedeutet der außere Kauf von Produkten oder Dienstleistungen oder die Beteiligung eines Dritten für die Implementierung der Prozesse. Ein Beispiel für diesen Ansatz ist die Bestimmung von Nurtdinova A. F.: "Outsourcing ist die externe Organisationen, die bestimmte Arten von Arbeiten auszuführen, die für diese Organisation nicht spezialisiert sind." Polyakov V. V. und Schtschenin R. K. glauben, dass Outsourcing eine Hinzufügung die so genannte Drittanbieter zur Lösung von Problemen in den Beziehungen mit den externen und internen Herausforderungen im Zusammenhang mit der Durchführung bestimmter Geschäftsprozesse oder mit High-Technologien ist.

3) Der Ansatz "Integration der Organisation" ist eine Vereinigung von wirtschaftlichen Geschäftssystemen. Die Business-Systeme sind die Kunden und die Outsourcer. Tatyanok M.V. glaubt, dass "in der Grundlage für temporäre Outsourcing-Geschäft die Integration von Kunden und Anbieter von Outsourcing-Dienstleistungen liegt, die die Kommunikation, Ressourcen, technologische Motivation, Werte und regulatorische Integrität haben."

4) Unter den Ansatz "Optimierung der Organisation" versteht man Outsourcing als eines der Methode zur Optimierung von keinen Kernprozesse an einen Dritten. Im Gegensatz zum ersten und zweiten Ansätze wird die Betonung nicht auf den Übertragungsprozess, sondern auf die Optimierung der Organisation gemacht.

Outsourcing bringt eine Reihe von Vorteilen, die für die Unternehmen jeder Größe eingesetzt werden können. Einer der Vorteile des Outsourcing ist die Kosten zu senken und dies erhöht die Ausführung der Transparenz, da sollte die Auslagerung von Aufgaben klar geregelt werden. Darüber hinaus ist Outsourcing ein wirksamer

Hebel, um die Flexibilität des Unternehmens zu erhöhen, weil im Falle der Notwendigkeit, es die Unternehmen schnell wachsende Nachfrage können zu reagieren. Outsourcing ermöglicht es den Unternehmen auf ihre Kernkompetenzen zu konzentrieren, ist es sehr wichtig, vor allem für Start-ups, weil die Gründer auf die Zukunft des Unternehmens zu konzentrieren können, anstatt die Aufgaben der Grundkompetenz durchzuführen.

Outsourcing wird immer durch einen Wertverlust begleitet; die Qualität der Arbeit von Experten, das Zeit; sparen die Steigerung der Effizienz; Flexibilität; vermindertes Risiko; schnelles Wachstum charakterisiert.

Außer den Vorteilen hat Outsourcing seine Nachteile:

1) Outsourcing erfordert eine engere Kontakte. Erfolgreiche Auslagerung von Aufgaben basiert nur auf ungehinderte Kommunikation, wenn alle Bedürfnisse, Anforderungen und Eigenschaften letzte Detail besprochen werden, dass schließlich alle Beteiligten zufrieden sein können. Das große Problem dabei ist, dass verbringt viel Zeit detaillierte und regelmäßige Konsultationen mit externen Anbietern.

2) Liefermanagement. Auch wenn es zwischen den Parteien auf unterschiedliche Weise übertragen wird, bedeutet Outsourcing immer Kontrolle zu machen (in verschiedenen Größen);

3) Abhängigkeit. Wenn die Aufgabe zu jemandem übertragen wird, ist aber noch die Abhängigkeit. Dies ist besonders ärgerlich, wenn die Verträge für mehrere Jahre und in kurzer Zeit abgeschlossen wurden, und sie können nicht gebrochen sein;

4) Mangel an Gelegenheit zur Verbesserung der Fähigkeiten. Während die komplexe Aufgaben zu lösen, wissen Mitarbeiter nicht immer, ob die Entscheidung richtig ist und daher wählen oft den Weg des geringsten Widerstandes;

5) Reduzierung der Belegschaft. Der Mangel an Ausbildungsmöglichkeiten ist von möglichen Entlassungen.

6) Wettbewerb: „Je mehr Mitarbeiter leiden unter Outsourcing, desto größer die Gefahr ist, dass das gesamte Team-Umgebung beschädigt;

7) Vertrauliche Einsicht. In Abhängigkeit von der Region, in der das Unternehmen tätig ist, kann es vorkommen, dass die externen Lieferanten über die Funktionen von vertraulichen Informationen informiert werden. Vertrauliche Zusammenarbeit ist sehr wichtig.

Es ist offenbar, dass die Vor- und Nachteile von Outsourcing im Gleichgewicht sind. Aber Outsourcing-Strategie wird in erster Linie positiv wahrgenommen. Der Grund dafür, dass die Vorteile auf der Hand liegen. Mängel sind in der Regel immer möglich, herum zu erhalten und die andere Seite zu erreichen.

Outsourcing kommt jetzt in fast allen Geschäftsbereichen. Dieses Prinzip ist universell einsetzbar und nicht zuletzt, weil es so beliebt ist. Trotz der allgemeinen Anwendbarkeit sind bestimmte Bereiche, die besonders häufig bei Outsourcing zu beachten sind:

1) Kundendienst;

2) Informationen;

3) Marketing (in all seinen Formen, zum Beispiel, Social Media und Content-Erstellung);

4) Informationen;

5) Rechnungswesen;
6) Grafik-Design;
7) Medien.

Outsourcing ist nicht nur für große Unternehmen, sondern auch für kleine und mittlere Unternehmen. Grundsätzlich ist die Geschäftsstrategie von Outsourcing sehr schnell erklärt. Diese Auslagerung von Aufgaben und abgeschlossene Projekte, die zuvor innerhalb des Unternehmens umgesetzt wurden. Das ist außerhalb eines Unternehmens oder einer Person unter Vertrag, der ein Experte im Outsourcing ist, kann die hohe Qualität der Arbeit laden.

Outsourcing ist ein vielversprechender Bereich, in dem kleine Unternehmen eine neue Aktivität organisieren, stabilisieren und weiter bestehende Geschäft auf der Grundlage langfristiger Verträge von großen Unternehmen entwickeln können. Das ist die Übertragung von Aufgaben auf professionelle Unterstützung reibungslose Effizienz der einzelnen Systeme und Infrastruktur durch langfristige Verträge (mindestens 1 Jahr). Er ist eine der wirksamsten Strategien, Kosten zu senken und das Unternehmen die wirtschaftliche Leistungsfähigkeit zu erhöhen, während Verpflichtungen gegenüber Kunden und Mitarbeitern beibehalten, aber das Budget unter strenger Kontrolle zu halten.

So bezogen sich die Fragen im Zusammenhang mit dem Wesen des Outsourcing betonen seine Vor- und Nachteile, die vielfältigen und komplexen Natur dieser Kategorie, und verwirklichen die Ziele der weiteren Forschung in diesem Bereich, einschließlich der Konzepte Systematisierung Merkmalsraum für die korrekte Definition des "Outsourcing" zu klären. Die Entscheidung dieser Probleme werden deutlicher praxisorientierten Managementtechniken Outsourcing in der Zukunft bilden.

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WHEN BRAIN SCIENCE AND MARKETING MEET

The aim of this study was to analyze the influence of neuromarketing on the purchasing ability of consumers when using the basic tools of the impact on human subconscious mind taking into account psychological factors.

Progress makes people keep up with the modern world, if they do not want to fall out of it. This is especially true for modern art of sales, when a person has absolutely nothing surprising, she has seen and tried everything, there are no products in short supply anymore, and nobody will create many hours in front of the store display.

Neuromarketing is one of the modern concepts of the impact on the human choice in retailing, based on consumer psychology research, which goal is to determine what images the target group reacts most actively to, and what feelings and emotions of customers should be emphasized.

Figures. Changing the left digit in the price tag affects the buyer's desire to give money for the goods. If the product has a price of 19.99, most consumers will perceive it as significantly cheaper than the product that costs 20. This can only be explained by the fact that people do not notice the right figure, but pay attention only to what is written on the left [1].

Font. Do people believe that it does not matter which font to use? The text, which has been printed in the standard font, caused the desire to delay the purchase of only 17% of people. When the text was hard to read, 41% of the participants postponed the decision [1].

Images. When a seller places a photo or another image next to the text the process of information processing becomes easier and faster. Particularly the effect of the picture, which will appeal to the values and ideological attitudes of the customer, will be stronger [3].

Emotions. People need stories, especially those that can cause a surge of emotions. The advertiser needs to come up with a strong and memorable story about the product and then put it in one short phrase like ‘Mars charges you with energy for the whole day’ and the hearts of customers will be won [1].

Music. Music encourages buyers to spend more. Some experiments have shown that the slower the pace of music in the mall, the higher the sales. Buyers of expensive wines and elite perfumes spend more money on classical music. But to form persistent memories of the brand in consumer’s mind it is better to choose simple and unpretentious melodies [2].

In today's visual pollution, knowing target audience and understanding their behavior also mean understanding what simulates their attention to companies’ advertisings. Neuromarketing offers the perspectives of a quantitative method to test the effectiveness of ads, logos and sounds before spending money on promotion. This new research tool is a vital instrument for those companies which tend to better understanding their customers and to design better products for them.

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HOW TO ACCOUNT FOR CHANGE IN RESIDUAL VALUE OF FIXED ASSET AND INCREASE IN THE USEFUL LIFE OF A FIXED ASSET?

The feature of the operation of the basic means is that they transfer their value to the manufactured products gradually, over several production cycles. Therefore, the accounting of fixed assets is reflected so that it was possible to know their initial physical shape and money loss.

Besides, the initial cost in operating a property does not change, except in cases of completion, reconstruction or partial liquidation. The replacement cost corresponds to the cost of acquisition or the creation of similar fixed assets in the market conditions. To determine the replacement cost of the swipe revaluation of fixed assets adjusted for inflation or market prices. Residual value is the initial (replacement) value less depreciation.

International Accounting Standard (IAS) 16 recognizes that residual value of asset may increase or decrease as a result of revaluations or future assessments of non-current asset. IAS 16 recognizes such change as a change in accounting estimate i.e. adjustment will be prospective in nature. There is no need to adjust for previously recorded depreciation charge in the financial statements.

Residual value helps in determining the depreciable amount of asset and the same is spread over the useful life of the asset. In straight line method a fixed portion of depreciable amount is transferred to income statement as expense from the cost of fixed asset recognized in the financial statements.

Residual value can increase or decrease as a result of assessment. Treatment is the same in both the cases. However, if residual value equals the current carrying value of fixed asset or exceeds it then depreciation for such asset will be halted until the time residual value reduces below the carrying amount of asset.

Any asset that has a lifespan of more than a year is called a fixed asset. All businesses use equipment, furnishings, and vehicles that last more than a year. Although they may last longer than other assets, even fixed assets eventually get old and need replacing.

Recovery periods are the anticipated useful lifespan of a fixed asset. For example, cars have a five year recovery period. While the car will probably run longer than that, you're not likely to continue using that car for business purposes after the first five years. You're more likely to trade it in and get a new car.

- Cost of the fixed asset: What you paid for the equipment, furniture, structure, vehicle, or other asset.
- Sales tax: What you were charged in sales tax to buy the fixed asset.

- Shipping and delivery: Any shipping or delivery charges you paid to get the fixed asset.
- Installation charges: Any charges you paid in order to have the equipment, furniture, or other fixed asset installed on your business's premises.
- Other costs: Any other charges you need to pay to make the fixed asset usable for your business. For example, if you buy a new computer and need to set up certain hardware in order to use that computer for your business, those setup costs can be added as part of the cost basis of the fixed asset (the computer).

During the life of an asset, the management might need to revise its accounting estimates of the useful life or salvage value of fixed assets.

Factors that may increase or decrease the useful life of fixed assets are presented in the table below:

1. Increase Useful Life:
   - Extensive capital investments in fixed assets;
   - Upgrading and regularly maintaining fixed assets;
   - Improved maintenance procedures;
   - Technological advances;
   - Typical industry practices;
   - Engineering department estimates;
   - Revision of operating procedures.
2. Decrease Useful Life:
   - Unexpected physical deterioration;
   - Unforeseen physical obsolescence;
   - Technical obsolescence.

Typical ranges of useful life estimates are as follows: automotive equipment (3-6 years), furniture and fixtures (5-12 years), machinery and equipment (3-20 years), buildings and improvements (10-50 years).

Finally, management might be less optimistic in estimating the useful life when fixed assets are purchased. This would allow the management to increase the useful life of fixed assets later on. The increase in the useful life would result in the decrease in the depreciation expense, and as the result, in the increase in net income.

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A COMPETENT RESTAURANT DESIGN – THE KEY TO BUSINESS SUCCESS

In today's world, appearance plays an important role, especially in the hotel and catering business, because the better the design a public institutionwill have, the more people will want to visit it.

An interesting design, atmosphere, original menu and excellent service - these are the components by which the restaurant businessshould be supported.A beautiful interior is a must for any institution, because it is - its main food we eat with our eyes.

One of the most popular styles in modern design of restaurants is minimalism: small tables and chairs in different colors, a small but spacious hall. There are no redundant interior parts, everything is simple and comfortable, which cannot helpflattering the eye.This style gained its popularity in Europe long ago, but it is also rapidly being developed in Ukraine, because people are tired of excessive luxury interior, massive leather sofas, very long tables and paintings everywhere.The atmosphere and comfort - this is what is needed.[1]

Also restaurants that have a focus on a specific country (Georgia, Italy, France, and Germany) are in great demand in Ukraine.This concerns not only food, but also the design of the institution: flag, national symbols, traditional colors, peculiarities of culture - all these things are very important, because such details in the design of the institution help us to feel the atmosphere of the country.

Quite an interesting solution in the restaurant business is a focus on organics. These are not only organic products from farms, but also the same theme in the interior.Many plants in interesting and diverse pots, fresh flowers, yellow and green walls, stylish and practical tables and chairs, wooden floors and windows, and the most important thing is that everythingis organically clean and safe.Therefore, going to such a restaurant, people can not only enjoy delicious and healthy food, but also feel themselves as a single whole with nature.[2]

It is essential the menu to be in harmony with the theme of the interior.If it is aimed only at desserts with chocolate - the decormust match: walls in light brown colors, paintings depicting sweet pastries and coffee, interesting details (chocolate figurines, candy watch).It is this approach to the interior that can impress.

It should be noted that in recent years the attendance of restaurants and cafes has increased considerably. According to this, the competition between them is growing, so all forces the personnel of catering business direct at increasing the level of their institution.The key to success, of course, is the interior, that's why everyone is trying to come up with something new and interesting.Terraces on the roof, graffiti on the walls, open kitchen, even pets become a successful course for interior

decoration.There are plenty of options, the main thing in this case is - the ability to think creatively and consider the wishes and interests of visitors.

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MODERN APPROACHES TO REGULATION OF WORK

Regulation of work is an important factor for successful functioning of market economy. Social and economic problems are characteristic of the domestic economy. Solving these problems requires the use of all potential labor reserves, which is impossible without labor standards.

Regulation of work performs different functions. It determines the salary, which in its turn requires accurate measure of labor. At the same time labor standard is a measure of remuneration [4, c.59].

Regulation of work is studied and described by many native and foreign scientists such as M. Belopolsky, M. Chumachenko, S. Dzyuba, O. Eskov, A. Galtsova, B. Genkina, E. Gulevsky, A. Kolot, P. Petrochenko, L. Potemkin, N. Taran and others. Many of these scientists tend to think, that regulation of work is a kind of enterprise management, aimed at establishing the optimal proportion between costs and results of work and also between the number of employees from different groups and the amount of equipment [2 c.186].

Regulation of work is caused by rapid development of large-scale machine production. Further division, specification, cooperation and synchronization of work at individual workplaces and production areas have become necessary. This has resulted in searching of scientific approaches to determining an effective measure of human labor, rational organization of labor process and organization of work.

F. Hilbret was the first to explain the principles of work regulation. He also applied timing for the first time. According to F. Hilbret the main functions of work regulation are:

– Planning. Standards are the basis of production planning at all levels of the organization;

– Salary differentiation. Standards are the reason for the correct establishing of salary;

– Labour organization. – Standards provide progressive conditions and methods of work;

– Social function. Standards provide reasonable and fair distribution of work income between workers**.**

The objectives of work regulation are:

– assigning the period of time for performing different types of work;
– assigning the rational and economical ways for using equipment;
– assigning the effective work on the employee's main workplace;
– analysis of effective and ineffective working time [4 c.78].

Work regulation starts with documentation. Then comes assessment of workplace standards. Personnel assessment reveals quantitative and qualitative characteristics of human resources. According to the results of personnel assessment managers set the labor standards and provide the conditions for their application. The company systematically monitors the implementation of those standards.

The main weaknesses of work regulation are:

– probable destroying of regulatory and methodological basis of working hours
– probable destroying of framework for establishing labour standards;
– probable neglecting of careful work regulation.

In order to prevent these weaknesses, employers can take some measures:

– improve the regulatory framework;
– create the system of labour cost development;
– improve the organization of work regulation;
– develop the automated system of work regulation;
– train and raise qualification of experts in work regulation.

So, we can conclude that work regulation minimizes costs, which benefits both the personnel and the company.

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ECONOMIC EFFICIENCY OF PRODUCTS OUTPUT IN PIG-BREEDING

Economic efficiency of pig-breeding and world development trends of the branch are considered in the article. Current state of pig breeding products output in Ukraine and its dynamics are given. The ways enabling to decrease production costs for pig breeding have been proposed.

Keywords: pig-breeding, products output, production costs.

Pig breeding is one of the most productive and precocious branches of animal husbandry. Principal pig breeding output is meat and fat being the important products for feeding people. Pork makes up about 40% in meat nutrition balance and takes the second place after beef.

Economic advantages of pig breeding are the following:

- quick provender payback as pigs are able to give great amount of fat under fodder economic expenses;
- pigs multi-parousness as at one farrow it is possible to get up to 12 piglets from sow, and in a year- till 18-24 piglets;
- short embryonic development period - under full feeding of saplings in the course of 7-9 months it is possible to reach head alive weight of 100-110 kg;
- precociousness.

That's why the subject under consideration is relevant. If to focus on world development trends it is worth mentioning that pig breeding is well developed in densely populated countries as food industry waste products as well as food debris are widely used for pig raising.

The branch gives 40% of world meat production. Two thirds of pig head is concentrated in Asia, in particular, in China. Pig breeding is well developed in the USA, Brazil, Germany, Russia, Ukraine, Poland [2].

Nowadays pig breeding in Ukraine is considered to be promising and profitable branch but in our country is at its primary stage. But all large domestic farms gained good results due to foreign experience, in particular, in Denmark and Holland.

Pig breeding is developed up to the whole territory of Ukraine but its predominant development is characteristic to densely populated regions on the farms engaged in grain and potato growing.

Pig breeding tendencies on the market of Ukraine at the beginning of 2016 may be characterized as:

- decreasing in volume of export and import volume increasing;
- landslide of prices for pork since the end of December 2015 till the middle of February 2016 per 20%;

- increasing in volumes of pig raising in live weight per 3,5% as well as increasing in selling of slaughter weight per 6%.

Thus, during the first quarter of 2016 0,9 thousand tons of pork were exported from Ukraine. That is 4/5 times less than for similar period of the previous year. The principal indicator of this shortening is prohibition for output export to Russia, came into force since December 25th, 2015. After loss of Russian market the main countries for home pork sale became Armenia –nearly 55, 3%, Hong Kong – 25 % and Georgia- till 12,5%. Output import, in its turn, increased per 24% and made up 0, 97 thousand tons [2].

In whole, for Ukraine the situation hasn't been stabilized and decreasing in the head of pigs is observed. In the course of 2015 the head of pigs decreased per 422,500 heads (or per 94,6%) and on January 1st, 2016 it made up 7 341,900 heads. (as can be seen in Figure 1)

The results of analytical survey of pig raising according to farms categories confirm that in 2015 the farms in Ukraine made up 49,2% while to agricultural enterprises – 50, 8% of the whole production market.

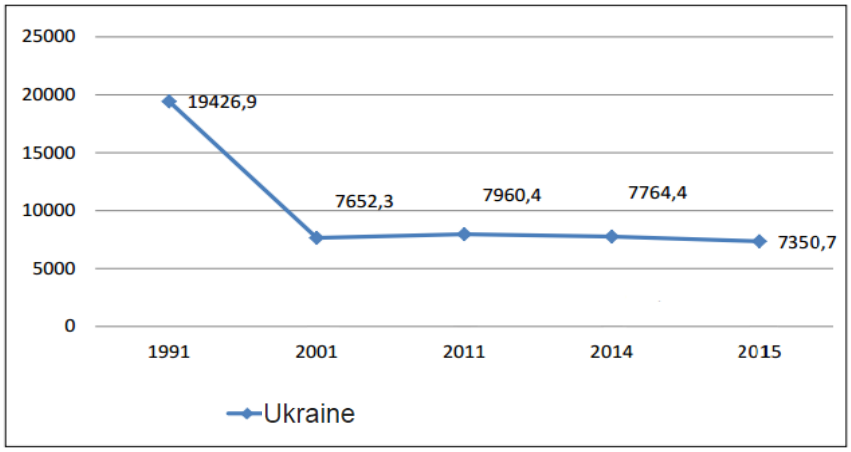

Figure1. Pig Heads Dynamics in Ukraine

Concerning output dynamics, unfortunately, the tendency to abrupt decrease in head of pigs in particular and in animal husbandry in whole is characteristic feature in recent years. At present it becomes unprofitable for agricultural enterprise to be engaged in animal husbandry. While plant growing ones more or less endures hard times as well.

Let us analyze the indices of farm production resources availability at the example of Production enterprise "Agrotechnologies". Pig productivity is estimated according to reproductive ability (reproductive quality) of sows and boars, fattening calves and beef performance. Animals performance indicator is the average yield per one animal. This indicator shows the status of quality livestock [3,c. 292-295].

As can be seen from the figure 2 pigs head in 2015increased per 30,58% in comparing with 2013. Dynamics of pork gross output and productivity is of positive character. And for the period since 2013 till 2015 it increased per 2,15 and 1,65 times.

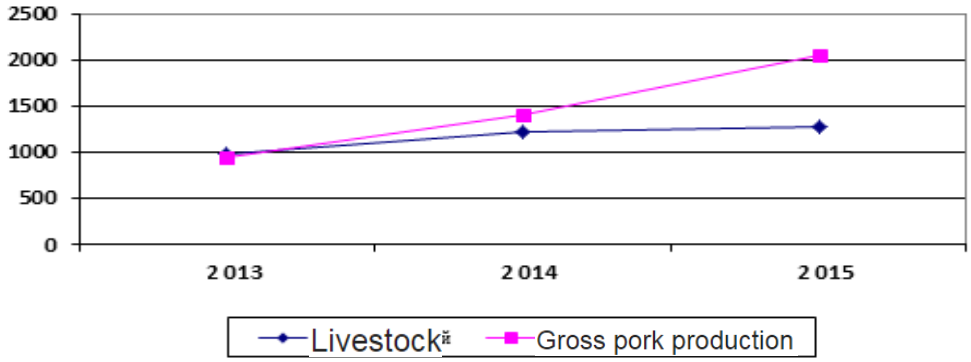

Figure 2. Dynamics of total output and head of pigs

What are the ways to decrease production costs for pig breeding? When substantiating the ways to decrease agrarian production costs it is important to take into account that with increased animal productivity cost decreases. Thus, the factors causing this increase can be considered as factors reducing the cost of agricultural products.

The most important conditions for the successful fulfilling the tasks to increase livestock production is radical improvement of fodder production, increasing in volume output of feed production, increasing its quality, reducing losses of fodder and their nutrients as well.

It should also be taken into consideration that the quality of protein, its amino acid composition seriously affects the average gain, feed consumption and animal health. At the optimal ratio of amino acids, vitamins and minerals in ration the norm of protein can be reduced by 15%[4].

Taking into account all above mentioned it should be concluded that factors providing the increase of pig productivity have to include:

-production introducing the best breeds, following the advanced methods of animals keeping;

-increasing fodder supplies of animal husbandry, following zoo-technical requirements when making up rations as for its balance of protein, mineral substances, and other nourishing components;

- increasing the feeding quality and intensity to increase alive weight pigs sold;

- improving specialization as well as concentration of pig breeding branch;

- fodder costs shortening;

- improving branch structure of enterprises focusing on market needs;

- trying to reach rational production concentration providing better resources use;

- introducing the advances of science, technique and advanced experience.

The factor for production cost decreasing is increasing labor productivity on the basis of complex production mechanization and automation as well as rational building up the organizational structure of private enterprises, introducing the improved inter-farm economic mechanism and effective leasehold relations [5,6].

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THE PSYCHOLOGY OF COLOUR IN MARKETING AND BRANDING

One important aspect in the promotion of products is the colour of the packaging. Product packaging, as a graphic design discipline, is an industry itself. It develops the coloured packages for certain goods and examines how consumers react to them.

According to research complied by web design and marketing company WebPageFX, people make a subconscious judgment about a product in less than 90 seconds of viewing, and a majority of these people base that assessment on colour alone. In fact, almost 85% of consumers cite colour as the primary reason they buy a particular product, and 80% of people believe color increases brand recognition [1].

Let's consider how consumers perceive the basic colors.

Blue is the colour which psychology dictates as insanely popular logo colour. It stands for being “trustworthy, dependable, fiscally responsible, and secure”. This makes sense when you consider the central role it plays in the identities of big brands like Facebook, Wal-Mart, AT&T, and probably your town’s police department. Consumers trust such companies to operate various fields of their everyday lives,

from going shopping to texting with friends or to saving for a new car, and that's why blue is the best choice for these brands. It makes consumers feel safe in their hands as they continue to innovate and grow their businesses.

Fast Company calls *yellow* an optimistic colour. It has the benefit of being bright enough to attract a consumer's attention from a distance. That is why Denny's and McDonald's both use yellow in their logos since they're eager to catch hungry travelers.

Purple is a strong colour with strong connotations. It's a go-to if you're looking to portray your brand as creative, imaginative, or wise (Syfy Network). It can also be a soothing, emotional colour.

Green is the easiest color for the eyes to process. It is associated with health, freshness, serenity and of course, money. All these things explain why green shows up in the logos of brands like Whole Foods, Land Rover, and Starbucks. Each one of the brands works to make sure consumers feel like they're invest into something to maintain their health or let people live freely, or get them outdoors.

Red is a very tricky color for marketers. It is often used to signal sale. It can be considered the strongest colour in psychology which symbolizes excitement and passion.

Orange is often referred to as a 'friendly' colour. It is used by everyone from Fanta and Nike to high fashion brand Hermes. The bright, bold orange, is applied by stores promoting value. Regardless of the tint, orange definitely plays up the friendly angle by raking in billions of dollars for these brands.

Black means business and luxury. That explains why it is the preferred colour for evening wear or business class cars. If you would like to convey drama, sophistication, and a hint of status, this colour will do the trick.

Thus, being armed with the necessary knowledge about the influence of colour on the consumer perception of the advertised product, you can create ads that will cause the 'right' emotions and will contribute to making a purchasing decision.

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THE OPTIMIZATION OF THE CAPITAL STRUCTURE OF THE ENTERPRISE IN THE MODERN CONDITIONS OF THE ECONOMY

The actuality of the research is that the most important directions in the activity of any entity is related to the movement of capital, but today economic theory cannot give satisfactory answers to the problem of determining the optimal capital structure.

The aim of this research is to explore methods of regulation that exist nowadays and optimization of the capital structure of the company and identify positive and negative features of the equity and loan capital usage.

The capital structure of the enterprise describes the ratio of equity and loan capital for development that involves different sources of funding with a view to long-term development of the company. The success of the planned development strategy entity depends on methods and techniques, which are used to optimize the capital structure.

The problem of enterprise choice financing arises while choosing a circuit structure of equity formation. As world practice shows – financing through equity deprives business for certain financial risks, but at the same time inhibits the growth of business and revenues. Speaking about loan capital, we should mention that it allows to increase and expand the business, provides competent management and distribution. But in this case the capital structure can not be built ideally, because when borrowed funds dominate their own, there are other risks, for example, the risk of insolvency.

Accordingly, each company must find only its inherent feature in structure, which optimizes the results of its financial activities and will be intended to implement at least two of the possible targets or increase profitability or focus on maintaining stability.

The optimization of the capital structure is determined by many factors, including:

- strategy and objectives of the company;
- streamlining processes in the company (manufacturing process and manufacturing technology products, placement of equipment);
- optimizing the financial structure;
- duration of the production cycle;
- company size.

The process of the capital optimization structure implements in this logical sequence:

1) Analysis of the composition and structure of capital carries out for some periods. Parameters analyzes, such as the ratio of financial independence, tensions, the relationship between short-term and long-term commitments [1].

2) Evaluated key factors that determine the capital structure:

- industry features of financial and economic activity;
- conjuncture of commodity and financial markets;
- profitability of current activities;
- the tax burden on business;
- life cycle of the company.

These factors are taken into account when managing capital structure of the enterprise and provide for the following tasks:

- installation using suitable proportions of equity and loan capital;
- provision as necessary to attract additional domestic and foreign capital [1].

The optimal capital structure is a ratio of loan capital and equity sources, at which maximizes the market value of the enterprise. It is necessary to consider each part of the capital, while its optimization.

Advantages of equity:

- Simply to attract.
- The high rate of returning the invested capital.
- Low risk of losing financial stability and bankruptcy.
- Greater ability to generate profits in all areas.

Disadvantages of equity:

- The expansion of economic activities is very difficult due to the limited amount of attraction.
- Do not use the opportunity to gain coefficient of return on equity by borrowing.

Thus, the company that will use only its own resources, has the highest financial strength, but limited possibilities of profit growth.

Advantages of loan capital:

- Great opportunity of raising capital.
- Providing the growth of financial potential.
- The ability to generate the growth of financial profitability and the coefficient of return on equity.

Disadvantages of loan capital:

- Difficult attracting.
- The need of collateral or guarantees.
- The assets generate lower profit margins.
- Low financial stability of the company.
- The risk of insolvency.
- The dependence on the fluctuations of the stock market.

Therefore, optimization of the organizations' capital structure is one of the most important and difficult tasks of financial management.

Research of the regulation methods and optimization of the capital structure has allowed the following conclusions:

1. The ratio between equity and loan capital is determined for each company individually.

2. During the process of capital optimization structure is necessary to consider the goals of the organization or increase the profitability, or focus on maintaining stability.

3. The most rational method for achieving the optimal ratio of structural elements of the company's capital can be a method that is based on the simultaneous maximization of owner’s equity profitability growth and level of financial stability.

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RISKINESS OF TAX AVOIDANCE SCHEMES IMPLEMENTATION

The important task of company's management team in a market economy is raising of operating efficiency. One of the forceful enablers of such task is tax planning.

Tax planning is a field of activities that can allow mitigate the impact of the external environment on current and future operating conditions of the enterprise, as well as ensure the balance between fiscal and regulatory functions of the taxes raising the effectiveness of stimulating role of the tax system. The main objectives of tax planning at the organizational level are assessment of tax payable to the budget and extra-budgetary funds on specific taxes for the next financial year, and preparation of the general budget of tax payments; calculation of target prime cost of production and development of the financial plan of the company; optimization of the main tax payments; monitoring of the tax payments accuracy, determination of tax burden level in planning period.

The framework of tax planning within the enterprise is tax optimization, defined as an organizational arrangement for selection of date, place and types of activity, creation of the most effective contractual relationships and models within the current legislation in order to increase cash flows of the enterprise by means of tax minimization. Thus, optimization consists in tax burden minimization in the long and short terms and avoidance of penalties imposed by the revenue bodies. It is impossible to underestimate the role of tax optimization, because such policy enables the company to avoid excessive costs for taxes at any particular period of time. In the conditions of high tax rates the wrong or insufficient accounting of a tax factor can lead to very adverse effects including bankruptcy of the enterprise. A situation when the enterprise pays the taxes, formally obeying the letter of the law without binding to

features of own business, demonstrates that nobody works on tax planning at the enterprise, which in turn represents the lack of knowledge of entrepreneurs about their rights, opportunities, benefits and, of course, risks.

Conceptual and practical aspects of tax planning and tax status of Ukraine have been investigated by Y.B. Ivanov, V.V. Karpov, P.Y. Buryak, O.G. Kuzmin, S.V. Ishchuk, S.S. Hrynkevych and other scientists. While appreciating the achievements of native scientists in the field of taxation attention should be drawn to considerable importance of planning in activities of each enterprise, including tax planning, as well as understanding of the implications and ways of such planning, which is the purpose of the research.

Before beginning any optimization we need to find out what its purpose is: reducing the overall tax burden or the expense of the payment of one single tax. The next tasks are the insight into the classification of optimization models and determination of acceptable risk for the company. And until after the selection of particular way it is appropriate to carry out calculations.

Optimization always entails risks and challenges in its implementation. Each of the possible models should be adapted and improved according to the current legislation to fit into the tax field. Efficient and optimal tax planning is the key to success in this business providing that there are deep knowledge of tax law, understanding of the use of tax incentives, the ability to find gaps in the legislation, the knowledge of tax systems and other aspects of the legislation.

Choosing a particular product or service, we walk after an approach "price meets quality" while choosing the optimization scheme we should be guided by such principle as “optimization profit should meet optimization risk”.

All ways in the optimization, in our opinion, can be divisible into three main groups, namely the withdrawal of funds from under the taxation, transfer of funds in the sector with lower taxation and deferring of the taxes. For a more detailed understanding of the nature of mentioned approaches let's consider each of them.

The indispensable condition of the schemes of the withdrawal of funds from under the taxation is the use of fictitious contracts and companies. Frequently in such situations it is possible to resort to attraction of nominee directors and founders to keep anonymity of the real owners. In most indicated schemes the funds are being derived from legitimate turnover and their reverse (back input) is already considered to be “laundering of income”. One of the optimization ways of this group is a scheme, which increases optimizers’ expenses due to the transfer of funds to the “gray’ and “black” companies. Thus increasing the expenses of the company and the credit against tax it becomes possible to get free cash and put into the company's turnover the goods purchased for cash. This phenomenon is called “phoenix operations” or the transfer of funds in cash using the “fly-by-night companies”, “conversion centers”. The following scheme of this group applies to the reduction of inventories as an alternative to the sales. It involves the sale of inventories at reduced prices due to corruption or fictitious destruction of inventories. In addition to the above this inventories are sold for cash. Another optimization scheme, which involves shifting the tax liability from one company to another, requires for its

implementation a company that is ready to sell a credit against tax or expenses. This can be an exporter who is not entitled to VAT refunds.

The schemes of the withdrawal of funds from under the taxation include an increased risk for optimizer, as they are illegal, short-term and can be fast detected by the revenue bodies. For those who economize through the transferring funds into cash, "conversion centers", taxmen may as a minimum charge additional VAT and income tax, as well as a maximum – it's possible to get under criminal prosecution under the article 212 of the Criminal Code of Ukraine "Evasion of taxes and dues (mandatory payments)".

The way of optimization, which involves the transfer of funds in the sector with lower taxation, differs from the first way primarily in the fact that the funds are not derived from legitimate turnover and if necessary they can be turned back. This group of methods includes the transfer of funds to other countries with lower tax rates. In this case it is referred to the offshores. If we resort to transfer the funds to other companies with different taxation system, it applies primarily to businesses with a simplified system of taxation that are on a single tax. As to the third direction of this group it involves the transfer of funds in other spheres of activities or at other companies with preferential taxation. Such schemes require extraordinary attentiveness and caution, because most of them are temporary. Their implementation is possible in agriculture, printing industry, IT, companies that employ persons with disabilities, etc.

As it has been mentioned this optimization path carries less risks than the first one, but it cannot be considered as the ideal. Considering the risk this is kind of "golden mean" between the withdrawal of funds from under taxation and the way of deferring of the taxes. The ability to detect such schemes appears if the company carries out its activities and enter into agreements on the basis of fictitious documentation or has lack of personnel and assets, and transactions are conducted with too low or too high prices and so on.

The third group of optimization ways by applying the deferring of the tax payments allows regulating the tax burden and is suitable for companies that provide long-term planning. In this way it is possible to achieve the reduction of tax burden for the next period, which further leads to its increasing. This group includes the pending operations for deferring of tax liabilities what involves the replacement of operations, which give rise to tax liabilities, with the transactions that do not lead to such consequences. One of the examples of such actions may be a contract of storage for further sales with the further registration of the transaction including the desirable deferring of tax liabilities instead of the agreement of sale and purchase. In this group there is a method of conducting the operations with their subsequent cancellation that is resorted to increase the credit against tax and expenses in the end of accounting period followed by those operations in future accounting periods, when there are necessary resources. It is also worth mentioning the way, which is referred to binding the occurrence of tax liabilities to reports and information received from contracting parties. Such involving of contracting parties is made to increase the time gap between the actions of contractors and occurrence of tax liability, in such a manner it is possible to achieve legal deferring of the tax payments, using the commission agent

agreement, contract of delegation and so on. The most striking feature of this optimization path is the lowest level of risk comparing with other optimization models. Identifying these schemes is possible only in case of mistakes made by optimizer, like some business operations are not timely concealed, only one way of tax optimization is used without resorting to their diversity, or improperly entered documents are used in business activities and others. Despite everything, this optimization model is less risky, bringing the content of transferring the taxes forward in time, rather than its avoidance.

Summing up, it should be pointed out that tax planning, including all methods of optimization of tax burden must strictly comply with the law, in other words be implemented by legal means. This optimization should make economic sense and be economically justifiable, and ultimately work towards increasing profit, rather than just minimizing taxes.

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THE IMPACT OF GLOBALIZATION ON DEVELOPED COUNTRIES

The phenomenon of globalization began in a primitive form when humans first settled into different areas of the world; however, it has shown a rather steady and rapid progress in recent times and has become an international dynamic which, due to technological advancements, has increased in speed and scale, so that countries in all five continents have been affected and engaged.

Globalization is defined as a process that, based on international strategies, aims to expand business operations on a worldwide level, and was precipitated by the facilitation of global communications due to technological advancements, and socioeconomic, political and environmental developments [1, c. 43].

The goal of globalization is to provide organizations a superior competitive position with lower operating costs, to gain greater numbers of products, services and consumers. This approach to competition is gained via diversification of resources, the creation and development of new investment opportunities by opening up additional markets, and accessing new raw materials and resources. Diversification of resources is a business strategy that increases the variety of business products and services within various organizations. Diversification strengthens institutions by lowering organizational risk factors, spreading interests in different areas, taking advantage of market opportunities, and acquiring companies both horizontal and vertical in nature.

Industrialized or developed nations are specific countries with a high level of economic development and meet certain socioeconomic criteria based on economic

theory, such as gross domestic product (GDP), industrialization and human development index (HDI) as defined by the International Monetary Fund (IMF), the United Nations (UN) and the World Trade Organization (WTO). Using these definitions, some industrialized countries in 2016 are: United Kingdom, Belgium, Denmark, Finland, France, Germany, Japan, Luxembourg, Norway, Sweden, Switzerland and the United States [1, c. 82].

The components of globalization include GDP, industrialization and the Human Development Index (HDI). The GDP is the market value of all finished goods and services produced within a country's borders in a year, and serves as a measure of a country's overall economic output. Industrialization is a process which, driven by technological innovation, effectuates social change and economic development by transforming a country into a modernized industrial, or developed nation. The Human Development Index comprises three components: a country's population's life expectancy, knowledge and education measured by the adult literacy, and income.

The degree to which an organization is globalized and diversified has bearing on the strategies that it uses to pursue greater development and investment opportunities.

Globalization compels businesses to adapt to different strategies based on new ideological trends that try to balance rights and interests of both the individual and the community as a whole. This change enables businesses to compete worldwide and also signifies a dramatic change for business leaders, labor and management by legitimately accepting the participation of workers and government in developing and implementing company policies and strategies. Risk reduction via diversification can be accomplished through company involvement with international financial institutions and partnering with both local and multinational businesses [2, c. 39].

Globalization brings reorganization at the international, national and sub-national levels. Specifically, it brings the reorganization of production, international trade and the integration of financial markets. This affects capitalist economic and social relations, via multilateralism and microeconomic phenomena, such as business competitiveness, at the global level. The transformation of production systems affects the class structure, the labor process, the application of technology and the structure and organization of capital. Globalization is now seen as marginalizing the less educated and low-skilled workers. Business expansion will no longer automatically imply increased employment. Additionally, it can cause high remuneration of capital, due to its higher mobility compared to labor.

The phenomenon seems to be driven by three major forces: globalization of all product and financial markets, technology and deregulation. Globalization of product and financial markets refers to an increased economic integration in specialization and economies of scale, which will result in greater trade in financial services through both capital flows and cross-border entry activity. The technology factor, specifically telecommunication and information availability, has facilitated remote delivery and provided new access and distribution channels, while revamping industrial structures for financial services by allowing entry of non-bank entities, such as telecoms and utilities [3, c. 74].

Deregulation pertains to the liberalization of capital account and financial services in products, markets and geographic locations. It integrates banks by offering a broad array of services, allows entry of new providers, and increases multinational presence in many markets and more cross-border activities.

In a global economy, power is the ability of a company to command both tangible and intangible assets that create customer loyalty, regardless of location. Independent of size or geographic location, a company can meet global standards and tap into global networks, thrive and act as a world class thinker, maker and trader, by using its greatest assets: its concepts, competence and connections.

Some economists have a positive outlook regarding the net effects of globalization on economic growth. These effects have been analyzed over the years by several studies attempting to measure the impact of globalization on various nations' economies using variables such as trade, capital flows and their openness, GDP per capita, foreign direct investment (FDI) and more. These studies examined the effects of several components of globalization on growth using time series cross sectional data on trade, FDI and portfolio investment. Although they provide an analysis of individual components of globalization on economic growth, some of the results are inconclusive or even contradictory. However, overall, the findings of those studies seem to be supportive of the economists' positive position, instead of the one held by the public and non-economist view.

Trade among nations via the use of comparative advantage promotes growth, which is attributed to a strong correlation between the openness to trade flows and the affect on economic growth and economic performance. Additionally there is a strong positive relation between capital flows and their impact on economic growth.

Foreign Direct Investment's impact on economic growth has had a positive growth effect in wealthy countries and an increase in trade and FDI, resulting in higher growth rates. Empirical research examining the effects of several components of globalization on growth, using time series and cross sectional data on trade, FDI and portfolio investment, found that a country tends to have a lower degree of globalization if it generates higher revenues from trade taxes. Further evidence indicates that there is a positive growth-effect in countries that are sufficiently rich, as are most of the developed nations [4, c. 142].

The World Bank reports that integration with global capital markets can lead to disastrous effects, without sound domestic financial systems in place. Furthermore, globalized countries have lower increases in government outlays and taxes, and lower levels of corruption in their governments.

One of the potential benefits of globalization is to provide opportunities for reducing macroeconomic volatility on output and consumption via diversification of risk.

Non-economists and the wide public expect the costs associated with globalization to outweigh the benefits, especially in the short-run. Less wealthy countries from those among the industrialized nations may not have the same highly-accentuated beneficial effect from globalization as more wealthy countries, measured by GDP per capita etc. Although free trade increases opportunities for international trade, it also increases the risk of failure for smaller companies that cannot compete

globally. Additionally, free trade may drive up production and labor costs, including higher wages for more skilled workforce.

Domestic industries in some countries may be endangered due to comparative or absolute advantage of other countries in specific industries. Another possible danger and harmful effect is the overuse and abuse of natural resources to meet new higher demands in the production of goods [5, c. 19].

One of the major potential benefits of globalization is to provide opportunities for reducing macroeconomic volatility on output and consumption via diversification of risk. The overall evidence of the globalization effect on macroeconomic volatility of output indicates that although direct effects are ambiguous in theoretical models, financial integration helps in a nation's production base diversification, and leads to an increase in specialization of production. However, the specialization of production, based on the concept of comparative advantage, can also lead to higher volatility in specific industries within an economy and society of a nation. As time passes, successful companies, independent of size, will be the ones that are part of the global economy.

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UDC 338

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WAYS TO IMPROVE PROFITABILITY

The main goal of any commercial enterprise is profitability. The essence of profit is determined by the economic performance of the enterprise and its place in the market. The basis of ensuring profitability is qualitative development of the company, which is estimated by profit or to be more specific by the parameter of profit quality as a key parameter. The quality of company profits is defined as a

general characteristic of the sources of income. The high quality of company profits is characterized by growth in sales [5, c. 180].

The profit of the company is affected by such important quality indicators as increase in productivity, reduction of costs, improvement of product quality and the use of production assets. Profit is the main source of expansion both of fixed assets and working capital and an effective tool that stimulates increasing of production performance and reduction in operating expenses.

To ensure sustainable growth of the enterprise some effective measures must constantly be implemented for maximizing profits. Among them are the following:

1. Planning - if the plan of getting profit is made up properly, professionally and proficiently, the company can determine the amount of payments paid to the state budget and the amount of profit remains at its disposal to create a financial base for development of its activities as well as necessary expenses for social development and financial incentives work.

2. Paying due attention to the product quality.

3. Constant search for reserves growth.

4. Maintaining of appropriate level of business (the ability to gain additional revenue and increase profitability is favourable for high business reputation, which primarily depends on timely fulfilment of all obligations to suppliers and customers).

One of the reserves of company profit growth is an increase in the volume of sale of commodity products. Between revenue and sale rate is a direct relationship, i.e. the more products are sold, when all other things being equal, the greater is the amount of profit, and conversely, losses lead to reduction of profits.

The increase in profits as a result of production activities enables the company to earn funds for production and social development, financial incentives. At the same time, growth of revenue at the company means the increase of contributions to the state budget [7, c. 302-307].

The reserve for profit growth of industrial enterprises is in the increasing of the quality of products and the elimination of losses caused by the defective goods. The problem of products quality in a number of industries is closely connected with increasing of durability and reliability of products. Many companies produce products with warranty [6, c. 232].

Practice shows that some companies provide guaranteed service life of products by the costs for premature repairs of defected products sold to consumers in the warranty repair workshops. It leads to reduction of product quality and increase of production costs, since the cost of products includes warranty costs. It results in moral and material damage for both a buyer and a manufacturer.

The means of production must be constantly improved too. It means to introduce new equipment, improve technology, introduce advanced materials and so on. This enables to reduce production costs significantly and thereby increase the profits.

Reducing of production costs is the most important condition for stabilization of prices, the economic prosperity of a company, the source of savings for

accelerating social and economic development of society and improvement of living standards[4, c. 126].

Reducing production costs is very essential for profitable growth. Reduction of production costs depends on savings of material, labour and financial resources, which use the company. The cost of production is very important for efficient functioning of an enterprise.

It should also be noted that with the increase in output profit increased not only by reducing costs, but also because of increasing the amount of products manufactured. Thus, the higher is the level of production, the higher amount of profit is received [1, c. 115].

Increasing in income may also occur due to increased productivity. With productivity growth labour costs per unit of production declines, and thus decreases the share of wages in the cost.

To reach it the company must actively use various motivational tools: the mode of payment, payment for overtime time work, delivery of workers to and from work on agreed routes, financial allowance to workers with the occasion of the anniversary and other important dates [3, c. 253].

To increase the received profit industrial enterprises must apply the adequate price policy. Prices should reflect some social aspects like nature, quality and purchasing power of consumers. The price affects largely the amount of profit, liquidity, solvency of the company and its financial position.

The sale of products depends on the labour remuneration of sales department workers.

An important role for sale plays marketing. World trade practice has shown that many types of new products do not find a buyer on the market without skilful marketing organization. Therefore, in these circumstances marketing should be paid special attention [4, c. 126].

To increase profit it is very important to preserve existed long-term economic ties. Their distraction has bad impact on production and logistics.

An inventory of supplies and equipment to identify surplus should be regularly conducted in order to increase the volume of profit from the sale. These surpluses must be sold at market prices.

The standards require improving too. Technically reasonable rates and regulations, well-timed reviewing of them, on the one hand, affect wages. But on the other hand they affect pricing [4, c. 54].

One of the reserves to increase the profits of industrial enterprises is the use of salvage resources and complementary products. The part of salvage raw materials in total material resources used in economics, increases significantly.

In conclusion the basis of the increase in profits is scientific and technological progress in manufacturing. The scientific and technical progress, decreasing of power inputs provide a sharp turn to intensifying of production.

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Session work №4

MODERN RESEARCH IN THE FIELD OF HUMANITIES

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THE ROLE OF LEARNING FOREIGN LANGUAGES FOR STUDENTS OF NON-LINGUISTIC UNIVERSITIES

Actuality of theme. At the beginning of the XXI century a foreign language became an important tool of international communication and the time has come, when Ukrainian society feels a sharp necessity in the specialists of different spheres, which would use a foreign language for solving the professional and personal problems.

The growth of the necessity in communication and collaboration between countries and people with different languages and cultural traditions, new economic and political realities, the reformation in the educational system of Ukraine require substantial changes in teaching a foreign language.

It is generally accepted that teaching English to students in non-linguistic specialities is related to a specific domain of knowledge, aimed at achieving specific goals within certain time limits. A great number of foreign scholars have been researching in the field of methodology of teaching English for specific purposes for the last decades: J.C. Richards (1983), T. Bowen, and J. Marks (1994), J. Flowerdew (1994), T. Dudley-Evans and M.J. St. John (1998), M.H. Haley and Th. Y. Austin (2003) and others.

The current state of the higher education with its emerging trends in development makes new demands for the professional training and personal qualities of the graduate. Profound knowledge and skills, ability to their flexible practice, initiativity, sociability, creative activity and continuous commitment to self-development are the most significant ones.

Modern students should be ready to carry out qualified information and creative foreign language activities in various areas and situations, business partnerships, joint production and research; to use English in their professional

activities, to satisfy their cognitive interests, to implement personal contacts and further self-education and self-improvement [3, с. 80-89].

The research aim is to explore the role of learning foreign languages for students of non-linguistic universities.

Foreign Language learning at non-linguistic universities should be oriented toward developing students' linguistic abilities (reading, writing, listening, translating and speaking) as well as providing a sufficiently knowledge of foreign culture. Communicative competence is the main target in language classes.

Results and discussion. Low level of language training, acquired by the most students at school, a limited number of hours have lead to low motivation in studying this discipline (Foreign Language). In this regard, there was an urgent need for a fresh look at educational process in general and foreign language learning in particular. To raise the level of foreign language specialist's training means to empower him with knowledge, practical skills and abilities that will allow him to use language as a means of informational activities, systematic replenishment of his professional knowledge and professional communication [4, с. 324].

An important factor is that students of technical universities express interest and readiness to further study of foreign languages, understand the importance of their study. The main motivation for learning a foreign language is to continue training in postgraduate study, contacts with foreigners abroad, the future employment [2, с. 232-234].

However, nowadays all students have their own reasons for learning English. There are some of them:

- English is the most commonly spoken language in the world. One out of five people can speak or at least understand English.
- English is the language of science, of aviation, computers, diplomacy, and tourism. Knowing English increases your chances of getting a good job in a multinational company within your home country or of finding work abroad.
- English is also the language of the Internet. Many websites are written in English – you will be able to understand them and to take part in forums and discussions.
- English is not only useful — it gives you a lot of satisfaction. You will enjoy learning English, if you remember that every hour you spend gets you closer to perfection [5, с. 259-264].

To the difficulties, preventing the effectiveness of foreign language learning on the non-linguistic faculties, some scientists refer:

– different level of the basic linguistic knowledge, communicational skills and abilities of learners;

– position of a teacher as a translator of knowledge and position of the student as an object of pedagogical process, which is expressed in the students' orientation on reproduction of "ready-made" knowledge;

– low level of self-guided work skills;

– lack of the self-education motivation;

– psychological unreadiness of students to work in a team environment;

– insufficient usage of innovative forms, methods and teaching aids by the teacher [1, с. 267-268].

Conclusion. Professionally-oriented learning of a foreign language is now recognized as a priority in the renewal of education. There is an urgent need for a fresh look at educational process in general and foreign language learning in particular. Foreign language communication becomes an essential component of professional competence of a specialist. The role of discipline "Foreign Language" in non-linguistic higher educational institutions increases significantly in professional activities of the graduates.

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THE DIVERSITY OF APPLIED LINGUISTICS

Despite the term ‘applied linguistics’ falls into science of language, which is a complex science already, the full spectrum of its possible definitions and connotations includes the volume and the depth of specialization much deeper in many kinds of its fields.

It is worth noticing at least one of many approaches existing in topic-related literature, which unfolds a range of synonymous definitions (like ‘computer linguistics’, ‘computational linguistics’, ‘automatic linguistics’, and ‘engineering linguistics’), to see how the vast diversity of science of language is transmitted into the computational field, where it equally connects with serious engineering and computer disciplines, at bottom, serving as solving means of the new special linguistic problems. Besides, considering an occidental specificity of understanding

the term ‘applied linguistics’ also adds language acquisition theory and translation theory to the above-mentioned aspects.

To all intents and purposes, applied linguistics as an academic specialty has to contain at least two areas: linguistics itself and computer engineering; moreover, the depth of mastering the course material cannot be reduced in any of the fields due to the specificity of tasks to be solved by its means.

Consider the main tasks and approaches in applied linguistics:

- dictionary and thesaurus making
- terminology standartization
- machine translation
- speech recognition
- text to speech
- data mining
- text processing and annotation
- text analysis
- text and data classification and clusterization
- data retrieval
- synthetic language creation
- transcription and transliteration
- translation theory
- language acquisition theory
- speech culture
- stylistics

As reflected by the list above, the range of problems applied linguistics is dealing with is a synthesis of a complex combination of different specialized fields from science of language and semiotics to computer engineering and digital signal processing, while applicable scope of its methods, approaches and abilities covers practically all provinces of human activities one way or another related to semantic information.

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DIFFERENCES BETWEEN BRITISH AND AMERICAN ENGLISH

The article deals with the problem of the English language that is different from the point of view of semantics, pronunciation, writing and grammar in native speakers of British and American cultures. It also demonstrates examples of these

differences and provides recommendations to the correct translation, meaning, pronunciation and usage of individual words.

The aim is to understand and realize why one and the same word in the English language can be pronounced differently, have a different value depending on its relationship to one or other kind of speech.

The main differences between British English and American cultures are that the same language is spoken in different places, and it's expressed in varieties or dialects.

British and American variants of English language are used in the following major areas:

1). Semantics (meaning of words);

2) Pronunciation;

3) Writing;

4) Grammar.

Semantics. Two important differences in the meaning of the words:

1) one and the same object can have completely different names;

2) the same word is used in both types of languages, but it may have a completely different meaning.

Differences of this type can discourage even native speakers. Such words are often referred to American/British ‘false friends’.

There are also some differences in British and s American spelling:

-our	-or
humour, labour, favourite, behaviour	humor, labor, favorite, behavior
ter	ter
centre, litre, theatre, spectre	center, liter, theater, specter

One of the ways of studying English is to explore rich, diverse, elegant British English, and on its basis to develop full of slang expressions American variant of the language.

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ONCOLOGICAL DISEASES, MODERN WAYS OF TREATING AND PREVENTIVE MEASURES

"In the case of covert cancer it is better not to use any treatment because patients if treated quickly die, therefore without treatment they can live for a long time."
The treatise "Carcinoma" aphorism 38 (250 BC)

The aim of this study was to investigate the oncological disease, modern ways of their treating and preventive measures. On the basis of this research the data from different materials were received.

Oncology - the science that studies the causes, mechanism of development and clinical expression of the tumor, as well as methods of diagnosis, treatment and prevention [1].

During the long history of humanity methods of tumor removing or "baking" of external sites were occasionally applied. The first successful surgery of cancer was of the sigmoid colon (Reubard, 1833), stomach (Billroth, 1874, Paean, 1879, Shlater, 1898), breast cancer (Halstead, 1889), kidney (Orlovsky, 1884) [2].

Then an effective vaccine to prevent cervical cancer was developed in 2005 year. All these discoveries show that humanity is making progress in fighting the cancer, even more rapidly nowadays. Although the disease is now developing even faster all over the world killing millions of people, among them even children. The causes of cancer, though, can be treated on early stages.

Tumors are divided by a set of clinically-microanatomical manifestations and changes into benign and malignant.

Most Common Types of Benign Tumors

- Adenomas (epithelial tissue that covers the organs and glands)
- Meningiomas (brain and spinal cord)
- Fibromas or fibroids (connective tissue of any organ)
- Papillomas (skin, breast, cervix, and mucus membranes)
- Lipomas (fat cells)
- Nevi (moles)
- Myomas (muscle tissue)
- Hemangiomas (blood vessels and skin)

Depending on the location and size of a benign tumor, treatment might not be necessary. Doctors will monitor it, track patient symptoms and do tests at specific intervals.

Most Common Types of Malignant Tumors

- Sarcomas (connective tissues such as muscle, tendon, fat, and cartilage)
- Carcinomas (organs and gland tissue such as the breast, cervix, prostate, lung, and thyroid)

Malignant tumors may not have symptoms initially and the first indication that something isn't right may be the detection of a painless lump. These types of tumors are "elastic," which enables them to grow fairly large before they are detected [5].

The main causes of cancer. Mutation of normal gene leads to cancer. Mutated gene that causes cancer is called oncogene and multiple mutations leads to tumor growth. The old cells or those that do not function die and new ones occupy their place. However, cancer cells do not die, they continue to divide rapidly and produce millions of new cancer cells. Tissue atypism is sizes and shapes of tissue structures change, sometimes is the total loss of morphological tissue signs. Cell atypism is performed by cellular and nuclear polymorphism: change of the shape, size, structure, color, quantity, size of chromosomes. Morphological atypia is a violation of organotypical, histotypical, cytotypical differentiation. In benign tumors it is a violation of organotypical and histotypical differentiation. In malignant first typical violation is of cytotypical differentiation. Atipizm physicochemical: increasing of water and potassium content (stimulation of growth and reproduction), a decrease of calcium and magnesium (decrease of cell-cell adhesion, development the capacity for invasion and metastasis); increase of the negative cell charge and electrical conductivity [3]. Functional atipizm - loss, gain, distortion of functions; discrepancy of tumor functioning in regulatory influences. The distortion appears in not characteristic functions of tumor - ectopic endocrine syndrome.

Metastasis - the formation of secondary tumor lesions due to the acquisition of the ability of tumor cells invade into the surrounding tissue, penetration into the blood and lymph vessels, survival and reproduction in no inherent microenvironment. Lymphogenous metastases - metastases in regional lymph nodes. Hematogenous metastases - secondary tumor foci in other organs resulting in hematogenous spread of tumor cells (emboli). Implantation metastasis arising from the spread of cancer cells on the surface. To form a secondary tumor, tumor cells need to leave the vascular bed and penetrate into the tissue. Cells must attach to cells of the vascular wall followed by a sprouting. One of the surviving cells is enough for new metastatic lesions, other survivors create new colonies of cancer. Malignant neoplasms - diseases that arise from abnormal proliferation of cells characterized by functional, metabolic and structural atypia and susceptibility to uncontrolled reproduction.

The main causes of malignant tumors:

- Smoking - 30%
- Diet Features- 35%
- Infections - 10%
- Professional factors - 4.5%
- Ionizing radiation - 4.5%
- Alcohol - 2.3%
- Ultraviolet radiation - 2-3%
- Air pollution - 1-2%
- Reproductive factors - 4.5%
- Low physical activity - 4.5%

Disease rate - the number of ill malignant neoplasms per 100 000 population per year. Mortality rate - the number of the dead from cancer per 100 000 population

per year. Every year in the world more than 10 million people are suffering from cancer and approximately 8 million die from it [7].

Treatment of cancer patients nowadays:

Radical treatment is considered when after the whole therapy tumor foci do not remain.

Palliative treatment is that when after the therapy of non-iliminated tumor foci both in the area of the primary lesion and in distant organs stay in the body. Symptomatic treatment involves eliminating complications that threaten the life of a cancer patient. Specialized treatment. Basic methods – surgical; radiotherapy; chemotherapy. Additional methods - hormone therapy; immunotherapy [6].

Future Cancer Treatment Methods

The growth in knowledge of cancer biology has led to remarkable progress in cancer early detection, treatment and prevention in recent years. Cancer research is currently advancing on so many fronts that are highlighted below.

Antiangiogenic chemotherapy

Recently, in many clinical trails angioinhibitors were also being used in combination with conventional chemotherapy. Clinical trails generally combine very low-dose of chemotherapy followed by angioinhibitor therapy. Combination of angioinhibitors will need to be tested vigorously in the future, as single angioinhibitors are approved for use of cancer. For example, it is very important to know whether bisphosphonates are synergistic with certain natural angioinhibitors such as angiostatin, endostatin, thrombospondin, arresten, canstatin tumstatin etc. Preventive angioinhibitory therapy may also be possible in the future, because angioinhibitory therapy is generally less toxic and less susceptible to induction of acquired drug resistance. Recently, some reports suggested that some foods have angioinhibitory substances. It is also better to test food that has high levels of natural angioinhibitors for prevention of cancer.

More targeted treatments

As more is learned about the molecular biology of cancer cell, researchers developed new classes of molecules such as antisense oligodeoxynucleotides and small interfering RNA (siRNA) for the treatment of cancer.

Nanotechnology

It is the use of extremely tiny particles for diagnostic imaging to more accurate location of tumors for delivering drugs more specifically and effectively into cancer cells.

RNA expression profiling and proteomics

RNA expression profiling permits scientists to determine relative amounts of numerous RNA molecules at one time. Knowing what proteins or RNA molecules are present in cancer cell can tell lot about how a cell is behaving and often can help to predict which drugs that particular tumor cell is likely to respond.

Finally winning the war against human cancer has been the focal point of present medical research. Single “cure-all” drug for cancer has not yet been developed, even though many new cancer treatment methods and drug targets have been discovered. The complexity of cancer disease requires scientific battle to fight against cancer in all frontiers [4].

Prevention of cancer is divided into 3 categories:

Primary prevention of cancer: the fight against smoking, promotion of proper nutrition and a healthy lifestyle; these methods allow to reduce the incidence of cancer to 1.5-2 times.

Secondary prevention - detection and treatment of precancerous diseases; screening programs to detect precancer and early cancers; ultrasound and mammography in women; test for occult blood in colorectal cancer; cytological screening for cervical cancer; endoscopic screening for gastric cancer is used to transfer the disease to curable .

Individual prevention of cancer based on detection of inherited genetic defects (adverse phenotype occurs in 40-50% of the population).

Key tasks and activities have been specified vis-à-vis the specific course of action. The planned policy result is a limited disease development risk, reduced number of advanced cases, extended life expectancy of oncologic patients and improved quality of life.

CONCLUSION

Everyone should take care of their health and undergo preventive examinations once a year; only prevention and timely diagnosis protect from the disease. Everything must be done to prolong life and improve its quality. You need time to recognize the disease. You need time to be consistently treated by strictly fulfilling all the recommendations of doctors. It is necessary to cooperate with them, knowing what to do and why. And even when there is no hope of recovery every person can live with dignity and happily a lot of time due to the proper care, psychological and spiritual support of others.

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THE EVOLUTION OF HUMAN AGGRESSIONIN MODERN SOCIETY

"He who makes a beast of himself gets rid of the pain of being a man." Dr. Johnson

Aggression is overt, often harmful, social interaction with the intention of inflicting damage or other unpleasantness upon another individual. The term aggression comes from the Latin word aggressio, meaning attack. My article deals with human aggression and a variety of its forms. Human aggression can be classified into direct and indirect aggression, whilst the first is characterized by physical or verbal behavior intended to cause harm to someone, the second one is characterized by a behavior intended to harm social relations of an individual or a group.

Aggression can take a variety of forms, which may be expressed physically, or communicatedverbally or non-verbally: including anti-predator aggression, defensive aggression (fear-induced), predatory aggression, dominance aggression, inter-male aggression, resident-intruder aggression, maternal aggression, species-specific aggression, sex-related aggression, territorial aggression, isolation-induced aggression, irritable aggression, and brain-stimulation-induced aggression (hypothalamus). There are two subtypes of human aggression: controlled-instrumental subtype (purposeful or goal-oriented); and reactive-impulsive subtype (often elicits uncontrollable actions that are inappropriate or undesirable) [1].

Violence is the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, which either results in or has a high likelihood of resulting in injury, death, psychological harm[6].

Globally, violence resulted in the deaths of an estimated 1.40 million people in 2015 up from 1.13 million in 1990. In Africa, out of every 100,000 people, each year an estimated 60.9 die a violent death.

Violence in many forms is preventable. There is a strong relationship between levels of violence and modifiable factors such as concentrated poverty, income and gender inequality, the harmful use of alcohol, and the absence of safe, stable, and nurturing relationships between children and parents. Strategies addressing the underlying causes of violence can be effective in preventing violence.

Anger or wrath is an intense emotional response. It is an emotion that involves a strong uncomfortable and emotional response to a perceived provocation, hurt or threat. [8] Anger can occur when a person feels their personal boundaries are being or going to be violated. Anger may be utilized effectively by setting boundaries or escaping from dangerous situations.

Anger is an emotional reaction that impacts the body. A person experiencing anger will also experience physical conditions, such as increased heart rate, elevated blood pressure, and increased levels of adrenaline and noradrenaline. Anger is used as a protective mechanism to cover up fear, hurt or sadness.

Ethologists study aggression as it relates to the interaction and evolution of animals in natural settings. In such settings aggression can involve bodily contact such as biting, hitting or pushing, but most conflicts are settled by threat displays and intimidating thrusts that cause no physical harm. This form of aggression may include the display of body size, antlers, claws or teeth; stereotyped signals including facial expressions; vocalizations such as bird song; the release of chemicals; and changes in coloration[7]. Most ethologists believe that aggression confers biological advantages. Aggression may help an animal secure territory, including resources such as food and water. Aggression between males often occurs to secure mating opportunities, and results in selection of the healthier/more vigorous animal. Aggression may also occur for self-protection or to protect offspring. Aggression between groups of animals may also confer advantage; for example, hostile behavior may force a population of animals into a new territory, where the need to adapt to a new environment may lead to an increase in genetic flexibility.

Human behavior is shaped by three main, animal drives. Taken together, these drives - dominance, food and reproduction,—achieve natural selection. Usually the more aggressive animals become the more dominant.

In mammals, the hypothalamus and periaqueductal gray of the midbrain are critical areas, as shown in studies on cats, rats, and monkeys[5]. These brain areas control the expression of both behavioral and autonomic components of aggression in these species. In human, aggressive behavior has been associated with abnormalities in three principal regulatory systems in the body serotonin systems, catecholamine systems, and thehypothalamic-pituitary-adrenocortical axis. Abnormalities in these systems also are known to be induced by stress, either severe, acute stress or chronic low-grade stress.

Testosterone is a steroid hormone from the androgen group, which is most linked to the prenatal and postnatal development of the male gender and physique, which in turn has been linked on average to more physical aggression in many species.

In many animals, aggression can be linked to pheromones released between conspecifics. Pheremones have also been identified in fruit flies, detected by neurons in the antenna, that send a message to the brain eliciting aggression; it has been noted that aggression pheremones have not been identified in humans.

Social and cultural aspects may significantly interfere with the distinct expression of aggressiveness. For example, a high population density, when associated with a decrease of available resources, might be a significant intervening variable for the occurrence of violent acts.

There has been some links between those prone to violence and their alcohol use. Those who are prone to violence and use alcohol are more likely to carry out violent acts. Alcohol impairs judgment, making people much less cautious than they usually are. Pain and discomfort also increase aggression

Conditions in the home--harsh and ineffective parental discipline, lack of parental involvement, family conflict, parental criminality, child abuse and/or neglect, and rejection--also predict early onset and chronic patterns of antisocial behavior[4].

Recommendation by national associations:

"The best way to prevent aggressive behavior is to give your child a stable, secure home life with firm, loving discipline and full-time supervision during the toddler and preschool years. Everyone who cares for your child should be a good role model and agree on the rules he's expected to observe as well as the response to use if he disobeys."

A number of themes that should be included in a school's plan for preventing and responding to youth aggression and violence:

* Conflict resolution/social instruction
* Classroom strategies for preventing and responding to disruptive behavior
* Parent involvement
* Screening to identify students who are at-risk for school failure
* School- and district-wide data systems
* Crisis and security planning
* School-wide discipline and behavioral planning
* Functional assessment and individualized behavior plans[3].

“Normal” aggression

Children and youth pass through a number of developmental stages in which certain negative behaviours, including those involving some aggression, can be considered commonplace or “normal[2].”

We have received aggression during the evolution, and without it we would not be able to survive and become the people in these conditions. Modern society has other laws that would remain the person we need to carry the heavy burden of animal origin suppression.

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THE USAGE OF MEDICAL APPLICATIONS IN IMPROVING HEALTH CARE

The aim of the article is to analyze the value and importance of the usage of medical applications and Ehealth technologies in improving the quality of patient care service.

Mobile medical devices and applications have become a part of daily life for million people all over the world. Medical smart technologies are used in health care settings, causing a rapid growth in the development of medical software applications (apps) for platforms. Innumerable apps are available to assist HCPs (health care professionals) with many important functions: information and time-management; health record maintenance and access; communications and consulting; reference and information gathering; patient management and monitoring; clinical decision-making; and medical education and sport training.

Health care professionals use smartphone or tablet for various functions. Medicine has been greatly affected by the availability of mobile devices. Numerous HCPs surveys show a high ownership rate of these tools, in both clinical practice and education.

The study found the popularity of mobile devices does not correspond with age and occupation, 80% of physicians ages 55 and older own a smartphone, 50 % of nurses ages 30-40 use a smartphone too. The results of the survey respondents, respectively, use mobile devices in a wide variety of clinical settings ranging from classrooms to hospitals. [6]

The high integration of mobile devices into clinical practice has been driven by the rising availability and quality of medical software applications (apps). Apps are software programs that have been developed to run on a computer or mobile device to accomplish a specific purpose. Faster processors, better memory, smaller batteries, and highly efficient open-source operating systems that perform multifunctions have paved the way for the development of a variety of medical mobile device apps for professional and personal use.

The ability to download medical apps on mobile devices has made a wealth of mobile clinical resources available to HCPs. A huge choice of apps that assist with answering clinical practice and other questions at the point of care are: medicine reference guides, medical calculators, clinical guidelines, support aids, textbooks, and literature search pages. There are also mobile apps that simulate surgical procedures or that can conduct simple medical exams, for example hearing or vision tests. Many mobile apps are not intended to replace desktop applications, but are meant to complement them in order to provide a resource that has the potential to improve

outcomes at the point of care. The use of medical apps has become popular and widespread; 70% of medical school HCPs and students reported using at least one medical app regularly, with 50% using their favorite app daily. [7]

HCPs not only need to be mobile themselves, they also need to be able to communicate and collaborate with people in different locations. Mobile devices satisfy this need by offering multiple means of communication, including: voice and video calling; text, e-mail, and multimedia messaging; and video conferencing.

In a survey of medical school HCPs and students, around 80% of respondents described using mobile devices to communicate with colleagues about patient care via e-mail, telephone and text messages (skype, Viber, Whatsapp, etc). Mobile devices also allow rapid response to e-mail, allowing users to keep up with communication. Mobile devices can also be used by HCPs to aid long-distance patients by allowing them to text or send pictures regarding problems or questions. [2]

Social networking apps are useful device for encouraging discussion, consultations, and collaboration among HCPs. Facebook itself has been used to establish a forum for consultations, discussions, and mini-lectures.

MedPage Today is one of the most popular apps among HCPs for accessing breaking medical news, organizing news by interest. The MedPage Today app provides information about drugs, diseases, and medical procedures, as well as daily podcasts, videos, and news updates.

Mobile apps can also be used directly to conduct simple examinations for visual acuity or color blindness, as well as blood pressure or glucose level.

Other mobile apps, such as medical calculators, use standard formulas to make calculations to determine risk scores and other measures, such as body mass index (BMI), body surface area (BSA), and proper drug doses. Popular medical calculators include: Epocrates MedMath, MedCalc, Mediquations. [3]

Mobile devices play an increasingly important role in medical education as students and schools use more technology during training. They are used by health care students in a variety of ways: to log their experiences, to access information about medical conditions and drug treatment, to perform calculations, and to make basic notes. [1]

Mobile devices have become educational settings, they are a “learn anywhere” resource for accessing information or double-checking knowledge.

Moreover, many mobile apps for health care students can be used for knowledge assessment, such as case study quizzes or tests to help prepare for board examinations. The ability to access all of these resources has been shown to enhance student learning in the clinical environment and to increase student knowledge scores. [7]

Medical devices and apps are already helpful tools for HCPs. They are obviously expected to become even more widely incorporated into nearly every aspect of clinical practice and health care system. Although medical devices and apps certain provide the HCP with many advantages, they are now being used without a thorough understanding of their associated risks, challenges and benefits.

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LINGUISTIC AND STYLISTIC SPECIFICS OF FUNCTIONING PORTRAIT DESCRIPTIONS IN HEMINGWAY'S STORIES

The aim of this study is to research creations by Ernest Hemingway, characters' portrait descriptions of his creations, specifics of his style, thrilling and at the same time amazing quotes and statements, his heavy life filled with awful war. The major task of this study is to prove that he wrote honestly, realistically, openly despite poor conditions, tears and pain. Stories of his characters show Hemingway`s honesty and decency. Recently, there has been an increase of interest in Hemingway's creative work. The relationship between the writer and society has been explored by many researchers. The last research was made by I. Drach, Rossels, A. Platonov, L. G. Bogoslovska**.** The central issue in our research is to analyze the creative work and the life of Hemingway, linguistic and stylistic specifics of functioning portrait descriptions in stories**.**

In general, this analysis shows that Ernest Hemingway is a unique American writer, novelist, and journalist. He was painfully worried about terrified events in the

world. We are impressed with his humanity and mercy. He started as a writer with these important parts. Hemingway saw his destination and the highest his task was to show real life. Ernest believed that only truth could help people. “I thought life is an entire tragedy and its end decided long” – he said. Feeling tragedy and finding of harmony inside of yourself filled many creations of writer. [2, c.6] We advocate further research on one of the first creations “Indian camp” his favourite character Nick Adams among nature touched with the beginning and end of the Earth – with birth and death. The first novel “The Sun Also Rises” is a classic example of his powerful weapon giving him world`s glory. He complained about the wrong understanding the novel: “Write such a tragic book like it and they accept this one as a surface jazz story”. The present study analyzes the theme of solitude with nature except the theme of war in his creative work. Nature is an endless source of joy and happiness. The sun, the lake, the forest, the fish in water are boy`s environment. And this nature is another side of human ado.

It would be thus of interest to investigate the style of the writer has specific features. These are pithiness, unusual dialogues, deep and meaningful sense. The problem of honesty is essential in his bright novel “The Snows of Kilimanjaro” where he created the image of the writer who sold own talent for money and comfort. «Helen is rich and graciously shares her wealth with her husband; however, he seems to resent her for it and even determines to write about a book about the rich and idle class. Harry is dying, and his hopes of getting help and surviving are fading quickly».

We cannot help speaking about Hemingway’s most popular story. “The Old Man and The Sea” was the last major work of fiction by Hemingway that was published during his lifetime. It tells the story of Santiago, an aging Cuban fisherman, who struggles with a giant marlin on the coast of Florida.

Furthermore, “The Old Man and the Sea” was awarded the Nobel Prize in Literature in 1954. It teaches never to give up, believe in better and fight for purpose. «The old man was thin and gaunt with deep wrinkles in the back of his neck. The brown blotches of the benevolent skin cancer the sun brings from its reflection on the tropic sea were on his cheeks.

To conclude, Ernest Hemingway is a special author, he is a fascinating person. His every story tells how to be truly happy, enjoy life and how to struggle for honesty and justice. “But man is not made for defeat," he said. "A man can be destroyed but not defeated.”[2, c.12]

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UDC 908

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FOUNDATION OF THEATRE IN BERDYCHIV: ANTON ZHMIYOVSKI'S LIFESTORY

This article attempts to analyze Anton Zhmiyovski's life and his achievements in the foundation and development of theatrical traditions in Berdychiv. Anton Zhmiyovski is considered to be the founder of Berdychiv theatre.

Traditions of performing arts in Berdychiv are firmly intertwined with the life of well-known entrepreneur Anton Zhmiyovski. Anton P. Zhmiyovski (Zmiyevskyy, pol.Zmijowski, 1769-1834). is one of the most prominent figures of professional theatre art in Volyn. A. Zhmiyovski was not only an entrepreneur but also an actor, director and playwright [8, p. 86].

The main centres of Volyn region, where the formation of a professional theatre took place, were the towns of Zhytomyr and Berdychiv. These are the places where public theatres were opened. Thus, a permanent building of theatre was built in Berdychiv around 1802, and in Zhytomyr in 1803. It is also important to emphasize that the first private theatrical enterprise in Berdychiv was founded in 1793, [1] and in Zhytomyr - in 1797 [2]. This can be considered the beginning of the history of theatre in Volyn region [8, p. 42].

It is important to note that the development of these theatres was associated with an active creative work of the famous entrepreneur A.Zhmiyovski. He is considered to be a pioneer of professional theatre art in Volyn. We know that Zhmiyovski was a cashier at the theatre of V. Boguslavski. There he tried his acting capabilities by playing menial roles [9, p. 202]. Later, A. Zhmiyovski continued his activities in Tulchin as a director of the court theatre of Count Shchensnyi Pototski, Russian and Podolski governor at the end of the XVIII century [8, p. 86]. The entrepreneur had to give performances for Pototski in Tulchin (governor's residence) and Uman.

Due to the fact that in 1793 Count Pototski left Tulchin (probably because of the division of Poland), A.Zhmiyovski moved to Berdychiv, where he founded the Polish troupe [1]. First, he gave performances at the inn, and then he built the theatre building near the stables, next to the trade rows. A few years later (1797) A.Zhmiyovski moved to Zhytomyr, but the theatrical company stayed in Berdychiv, where they acted until 1800.

Later, the theatrical life in Berdychiv was somewhat sluggish. A permanent theatre company did not exist. But at the time of the governor of Zhytomyr, M. Komburleya semi-amateur theatre company went on tour. To honor the distinguished service of A.Zhmiyovski, Pototski left a legacy of a great theatrical wardrobe (about

700 different kinds of costumes, masks and props), a theatrical library (70 items, including 50 comedies, 9 dramas, 7 tragedies, 4 operas) [9, p . 218]. All donated by Count Pototski A.Zhmiyovski took to Zhytomyr, [9, p. 204], where he occupied a permanent theatre building that was previously owned by Pototski [3]. With his own company A. Zhmiyovski performed in many cities of Ukraine, including in Zhytomyr (1797), Tulchin (1799), Dubna, Kyiv (1800, 1804-1805, 1816, 1819).

Moreover it is also important to mention that at this period, namely in 1816 an actor, director, entrepreneur of Russian Empire - Ludwig Y. Mlotkovski (Mlatkovski, Molotkovski; born ca. 1795 - died March 27, 1855) acted in A.Zhmiyovski's company [7]. The best known period of Anton Zhmiyovski's activity is the time when he managed the theatre in Zhytomyr. Here he presented works by V. Boguslavski, F. Zablotski and scenes from the plays of Shakespeare. Under his leadership *Barbara Radzyvylivna* by K. Zelinski was staged in Zhytomyr theatre. It was the evidence of Anton Zhmiyovski's ambitions.

In performances of Zhytomyr theatre, A.Zhmiyovski played on the stage at his own dramas that sometimes were very unusual. He is the author of the stage plays

Catching ghoul, Enchantress of the Visla, Chumak-magician and others. It should be noted that the last piece had considerable success, and it was staged for the first time in 1834 at Zhytomyr theatre. It was in the repertory theatrical companies of V. Petrovski, K. Zelinsky, I. Dreysih, P. Medvedev. Different interpretations of this play were successfully performed at the theatres in Western Ukrainian, Russian, Georgian and Tatar stages [5, p. 273]. A. Zhmiyovski was notable for the extraordinary gift of clear pronunciation and memory, and was a skilful organizer of the theatrical business. In 1829, he even organized a small opera house. However, because of various external circumstances there was a decline of his activity, and in 1834 left by his most dedicated actors, he died in poverty. [6]

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UDC 130 001

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ROLE OF MUSIC IN LEARNING ENGLISH

People can learn English in different ways. Some watch films or serials in English, others prefer reading English books, articles, news. Of course, it is better to use the combination of all these methods, but people are different and everyone chooses what he or she wants. Let's consider one more way of learning English – learning through songs and music.

Why music? Firstly, everyone listens to music, even when they don`t want, for example in public transport. Music is a kind of art and it doesn`t matter what genre people listen to. As English is an international language, there are a lot of musical pieces in this language and you can choose your favorite genre.

Learning English through music gives you possibility to do it everywhere, any time and requires only your desire to learn something new. But it would be better if you read, translate the text of a song and do some other learning activities after listening. In general, there are a lot of pieces of advice how to do it effectively. There is a lot of information on the Internet. For example, http://www.fluentu.com [1] represents the article "8 Great Tips to Learn English Through Songs and Music". There is universal advice that doesn`t require considerable efforts to use. Another one is http://englex.ru [2]. On this web-site you can find some helpful tips how to learn English through music too. It also contains a list of useful links which will help you learn English. And the last one that we want to recommend to you is https://skyeng.ru [3]. There are several reviews from English teachers how to do it. In general, everything can be brought to the following:

- Choose the right song. It means that different songs can be used for different levels of study. For example, rap music includes a lot of slang words and it can be hard for beginners to understand. It would be better for them to start with pop music.

- Sing songs. Sing songs even if you aren`t good at singing. It helps you improve pronunciation and it is fun. Try to sing songs from memory. It is very useful because you remember words and understand where and how they are used.
- Do it regularly. It is really important because regular lessons are the key to success.
- Be a music lover. Don`t be afraid of trying something new. There are a lot of different music genres in English. And each of them contains different grammar constructions, slang words and lexicon.

Learning through music works well even if you aren`t a musician or a singer. These pieces of advice can be used by everyone.

Consider the ways of working with songs if your purpose is to master your English.

The following steps must be taken in order to turn just listening into educational material:

- Listen to the song. If you feel that you really like the song, then try to find the lyrics of the song on the Internet.
- Listen to the song again reading the text. Then translate the words of the song.
- Look at the song translated word by word. You can see that it makes no sense because there are idioms, collocations and phrasal verbs in it. Find them and find their meaning.
- Now when you know all these word combinations, change the text: rewrite it omitting some of the words and word combinations.
- Try to sing this song without some words.
- Finally you will be able to sing without looking at the text, by heart.

And you can be sure that you remember all the words and expressions.

Now let`s look at some of the songs:

1. Pink Floyd – Time

There are a lot of phrasal verbs, collocations, idioms and artistic touches here.

Ticking away the moments that ***make up a dull day***
You fritter and waste the hours in an ***off hand way***
Kicking around on a piece of ground in your home town
Waiting for someone or something to show you the way

Every year is getting shorter, ***never seem to find the time***
Plans that either ***come to naught*** or half a page of scribbled lines
Hanging on in quiet desperation is the English way
The time is gone, the song is over, thought I'd something more to say.

make up a dull day **–** to create a boring day
off hand way **–** something is done carelessly
kick around **–** to drift idly from place to place
never seem to find the time **–** to have not enough time
come to naught **–** to be totally unsuccessful or amount to nothing

hang on – to wait awhile

2. Nirvana – About a girl

There is an interesting repetition of the phrase "I do" which means – "it is true". This song also contains some phrasal verbs, collocations, idioms.

I need an easy friend
I do.. with ***an ear to lend***
I do.. think you ***fit this shoe***
I do.. won't you ***have a clue***

I'll ***take advantage*** while
You ***hang me out to dry***
But I can't see you every night, free
I do

I'm ***standing in your line***
I do.. hope you have the time
I do.. ***pick a number*** too
I do.. ***keep a date with you***

an ear to lend – to listen to
fit this shoe – to suit
have a clue – to understand what smb means
take advantage – to make good use, to benefit
hang smb out to dry – to betray
stand in one's line – to pursue
pick a number – to take a phone number
keep a date with smb – to meet

1. Pink Floyd – Wish you were here

There is a popular construction with the word "wish", and again some phrasal verbs, collocations, and idioms:

So, so you think you ***can tell***
Heaven ***from*** Hell
blue skies ***from*** pain
Can you tell a green field
From a cold steel rail ?
A smile ***from*** a veil ?
Do you think you ***can tell***

And *did they get you* ***to trade***
Your heroes ***for*** ghosts ?
Hot ashes ***for*** trees ?
Hot air ***for*** a cool breeze ?
Cold comfort ***for*** chains ?

And *did you* ***exchange***
A walk on part in the war
for a lead role in a cage?

How I wish, how ***I wish you were here***
We're just two lost souls
Swimming in a fish bowl,
Year after year
Running over the same old ground
What have we found ?
The same old fears
Wish you were here

to tell smth from smth – to find differences between
to trade smth for smth - (here) to exchange smth good for smth bad
did *they* ***get*** *you to trade,* ***did*** *you* ***exchange*** – using Past Simple
How I wish, how ***I wish you were here*** – grammar construction – **wish + past simple is used to express that we want a situation in the present (or future) to be different.** Author means it`s a pity that his friend isn`t with him.

Conclusion: Learning English through music really works. You can choose a genre, a song, whatever you want. You can do it anytime and it requires only your wish. Of course, for better result you should do it regularly. There is a lot of useful information on the Internet which will help you improve your English. You can work with your favorite songs in different ways, find grammar constructions, artistic touches. It doesn`t require from you to be a professional singer or a musician because each of us just likes listening to music. It is really interesting and can be helpful for learning English.

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UDC 81-13

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THE FORMATION OF THE DEVELOPED AND LINGUISTICALLY COMPETENT PERSONALITY OF THE FUTURE EDUCATOR AT THE LESSON OF ENGLISH

Today the main task of the teacher of a foreign language is the formation of the developed and linguistically competent personality of a future educator or teacher. Performing this task is the goal of each lesson of the English language.

Despite the fact that communicative competence at the lessons of the English language was studied and researched by such scientists and methodologists as Pasov Y. I., Zhynkin N. I., Nikolaeva S. Y., Buslaev F. I., Panko T. I., Potebnya A. A., Shcherba L. V., and others, but there are still many questions to be explored.

The novelty of the publication is that it offers various forms of work of the teacher in order to prepare the fully developed and linguistically competent personality of a future educator or teacher. The aim of this paper is to show the feasibility of using various methods of the development of students' oral speech.

Nowadays both every student in particular and our country in general are interested in the practical mastery of a foreign language that provides withdrawal to the world market and introduction to world culture. Therefore, communicative competence becomes the priority objective.

The main purpose of foreign language teaching is to develop students ' abilities to use a foreign language as a tool in the dialogue of cultures and civilizations of the modern world. The formation of students' skills of foreign language communication involves achieving such a level of communicative competence by them that would be sufficient to carry out communication in certain communicative spheres [1, 121]. According to the standpoint of the state language policy teaching foreign languages is one of the priorities of modern education.

Communicating in our native language, we do not think about what to say and in what sequence, because linguistic skills are automated and performed instantly. If at the time of speaking in English students have certain difficulties, this indicates a lack of completeness of their automatisms or speech skills and abilities. Methodologists and linguists Pasov Y. I., Zhynkin N. I., Nikolaeva S. Y. consider that speaking skills have the following characteristics: purposefulness, productivity, independence, dynamism and integrity [7, c. 144].

In this paper we demonstrate the tasks of the teacher of a foreign language. The major task of the teacher at the lesson of the English language is to form the fully developed and linguistically competent personality of a future educator or teacher. Besides, the acquired knowledge and analysis skills of reading will help in the formation of professionally significant qualities of the future specialist who is able to think creatively, competently and freely express his or her opinions, use the

knowledge in professional activities, for instance, in their practice or work in the kindergarten.

The methodological aim of the English lesson:

• to direct educational activity of students for successful work in today's society;

• to form students' basic language competence which ensure success in composing dialogues and in expressing their own thoughts.

The methodological purpose of the activity is realized through the integrated use of modern teaching methods, among which the main one is the method of conversation which makes possible to perform all tasks of the practical lesson:

• to develop students' independence;

• to improve and expand acquired knowledge;

• to form skills of working with supplementary and reference books;

• to express their own opinion competently;

• to exchange impressions with each other about the reviewed movie or play correctly;

• to master the methods of selection of the material and the ability to identify the main thing;

• to teach students to use various forms of work.

Moreover, the conversation with the student can be in the form of teacher-student, student-student. English speaking language of students is practiced with the help of dialogues. Studying the English language, each student tries to express their thoughts coherently and intelligently and understands another person easily. However, this is impossible without a certain lexical base, a set of words used in a given situation.

The paper examines the main peculiarities of dialogues. One of the greatest advantages of dialogues in English is that they describe all kinds of everyday situations which make up our life and we must be able to understand them. This fact automatically makes conversations valuable for learning the English language, because students need to know the vocabulary which they contain in order to react correctly in any given situation. The words the English-language literature is filled with are not always used in the conversation, yet, dialogues can be saturated with acronyms, abbreviations, slang, certain structures, and interjections.

Not only dialogues, but many different techniques should be used for the students' development of speaking and writing abilities:

• continuation of the thought: complete the given beginning with 5 sentences.

- I like spring. ….
- One morning…
- If I have a chance, I would like to visit / to go…
- Today I'd go to the theatre / the cinema because…

• explanation of the proverb: explain how you understand such a proverb as..

- So many countries so many customs.
- Tastes differ.
- While there is life, there is hope.
- Better late than never.

- First think, then speak.
- Life is not a bed of roses.

• explanation of wise sayings: explain the wise statement.

- I have found if you love life, life will love you back. /Arthur Rubinstein/
- In the end, it's not the years in your life that count. It's the life in your years. /Abraham Lincoln/
- The most important thing is to enjoy life – to be happy – it's all that matters. /Audrey Hepburn /
- The privilege of a lifetime is being who you are. /Joseph Campbell/
- Life is a dream for the wise, a game for the fool, a comedy for the rich, a tragedy for the poor. /Sholom Aleichem/
- Whoever is happy will make others happy too. /Anne Frank/
- We know what we are, but know not we may be. /William Shakespeare/

The present study analyzes the basic concept of a new linguistic discipline which is the concept of the text. There are also contradictions concerning the type of broadcasting. Sometimes it is emphasized that the text is a monologue. This opinion is shared by Melnichaiko V. Ya., Plenkin N. A. [3, c. 10; 8, c. 103]. Monologue speech is the language party of one person, addressed to many listeners at the same time (it is not designed for immediate verbal reaction of the listeners), the method of carrying out long-term and purposeful influence on the audience [2, c. 333].

However, other scientists say that the text can exist in the form of the monologue and the dialogue. Among them there are Moskalskaya O. I., Morokhovsky A. N. [5, c. 159; 4, c. 4]. The dialogue, unlike the monologue, is not consistently and expediently organized speech activities. It is usually built without special training, it is difficult or even impossible to predict its course in the conversational speech [2, c. 339]. We also agree with this point of view.

It is worth mentioning that the methodology of teaching foreign languages requires practical students mastering of the language skills at a level which is sufficient for the implementation of foreign language communication in four types of speech activity: listening, speaking, reading and writing in typical situations. Students' mastering the foreign language communication involves the formation of a certain level of communicative competence. According to our point of view it is advisable to recognize the logical interpretation of the text in monologue and dialogue forms. These forms are characterized by common regularities of the text formation that determine the nature of any text, but differ from the structure of the underlying speech situation and the arrangement of the text.

In this paper we demonstrate different kinds of work at the lesson of English which help to form developed and linguistically competent personality of a future educator or teacher. The teacher promotes the development of communicative skills of students by making up dialogues on various topics and tasks on the continuation of the ideas. The explanation of proverbs not only helps to develop oral speech of students, but also becomes a tool in the dialogue of cultures and civilizations of the modern world. It should be noted that the statements of wise men make students think and express their own feelings and emotions from heard or read information by using new lexical material. All these tasks contribute to the formation of students' skills of

foreign language communication and they reach the level of communicative competence that would be sufficient to carry out communication in certain spheres of life.

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UDC 615.8

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THE ROLE OF ALTERNATIVE MEDICINE IN MODERN HEALTHCARE

The aim of study was to determine the role and place of alternative medicine in modern medical science, to examine its principles and types as well as some popular alternative medical treatments.

Alternative medicine is any medical treatment that is not part of conventional evidence-based medicine, such as one would learn in medical school, nursing school or even paramedic training.

Alternative medicine exists in all cultures to some degree and terms such as traditional medicine, indigenous medicine or folk medicine etc. are used to describe

such practices. These medicines date back hundred or even thousands of years depending on the country and culture concerned.

Alternative medicine consists of a wide range of health care practices, products, and therapies and their accompanying theories and beliefs, other than those intrinsic to the dominant health system of a particular society or culture in a given historical period.

There are more than 100 systems of alternative medicines still in practice all over the world. Every country, region or area has its own traditional system of health and medical cares such as for the Chinese it is acupuncture, for the French, magnetic healing; for the Germans, Heilpraxis; for the English, Herbalism; for India, Ayurveda with Siddha being widely practice in the southern part of the country; for Japan, Shiatsu etc.[6]

Why do people use alternative medicine? There are many personal, spiritual and medical reasons why people choose alternative treatment over the traditional, conventional approach. These reasons are: had negative experiences in the past with conventional medicine; spiritual or religious reasons; wariness of chemicals and toxins; preference of the holistic approach; focus on prevention.[4]

Alternative medicine is based on such principles as prevention is better than cure; attaining optimal health; patient is a person not a disease; individualistic approach; radical removal of disease.

There are five major groups of alternative therapies: Energy Medicine, Biology Based Practices, Manipulative and body-based practices, Mind-body interventions and Whole Medical Practices.

Energy Medicine. Energy medicine is a domain that deals with putative and verifiable energy fields (Biofield therapies such as Qi gong & Reiki or therapeutic touch and bioelectromagnetic-based therapies such as magnetic fields). The goal of these therapies is to unblock or re-balance your energy force.

Biology Based Practices. Examples include dietary supplements and herbal remedies. These treatments use ingredients found in nature. Examples of herbs include ginseng, ginkgo and echinacea; examples of other dietary supplements include selenium, glucosamine sulfate and SAMe. Herbs and supplements can be taken as teas, oils, syrups, powders, tablets or capsules.[3]

Manipulative and body-based practices feature manipulation or movement of body parts, such as is done in chiropractic and osteopathic manipulation, massage and acupuncture.

Mind-body interventions. Mind-body techniques strengthen the communication between your mind and your body and spirit. Examples of mind-body connection techniques include meditation, prayer, relaxation and art therapies. It works under the premise that the mind can affect "bodily functions and symptoms".

Whole Medical Practices. Examples of whole medical systems include ancient healing systems. These healing systems arose long before conventional Western medicine and include Ayurveda from India and traditional Chinese medicine.

The most popular forms of alternative medicine are Ayurveda, Homeopathy, Naturopathy, Yoga, Acupuncture, Acupressure, Magneto therapy, Shiatsu, Iridology,

Reflexology, Herbalism, Meditation, Aromatherapy, Chromo therapy, Diet therapy, Massage Therapeutic, Hydropathy and Reiki.

Homeopathy is a form of alternative medicine based upon principles first defined by Samuel Hahnemann in 1796. A central thesis of homeopathy is that an ill person can be treated using a substance that can produce, in a healthy person, symptoms similar to those of the illness. Homeopathy can treat a wide range of illnesses such as infertility, period problems, menopause, pregnancy issues, migraines, skin complaints, allergies, hay-fever, IBS, depression, stress, anxiety, sleep problems. Homeopathy is suitable for everyone – babies, children, and adults.

Reflexology. This modality is based on the idea that specific points on the feet and hands correspond with organs and tissues throughout the body. With fingers and thumbs, the practitioner applies pressure to these points to treat a wide range of stress-related illnesses.

Naturopathy. This approach focuses on noninvasive treatments to help your body do its own healing and uses a variety of practices, such as massage, acupuncture, herbal remedies, exercise and lifestyle counseling. (Traditional Chinese, Ayurveda, homeopathy and naturopathic medicine).[1]

Ayurvedic medicine is a very comprehensive system that places equal emphasis on body, mind, and spirit and uses a highly personalized approach to return an individual to a state where a person is again in harmony with their environment. Ayurvedic medicine uses diet, exercise, yoga, meditation, massage, herbs, and medication and, despite its long lineage, is as applicable today as it was 5000 years ago. Evolving throughout its history, Ayurveda remains an influential system of medicine in South Asia.

Acupuncture. It is a major part of Traditional Chinese Medicine. Fine needles are inserted at specific points to stimulate, disperse, and regulate the flow of vital energy, and restore a healthy energy balance. It is used to treat a wide range of conditions including back pain, sciatica, muscular injuries, arthritis, Irritable Bowel Syndrome(IBS), menstrual disorders, infertility, sinusitis, asthma, hay-fever, skin problems, smoking addiction, stress, fatigue, insomnia, and migraine.

Hydrotherapy. It is defined as the scientific application of water for therapeutic purposes. Water may be used at various temperatures, in different modes and in different forms. It is used in treatment of different conditions, including arthritis and related rheumatic complaints.[2]

Chiropractic. The chiropractic views the spine as the backbone of human health: misalignments of the vertebrae caused by poor posture or trauma cause pressure on the spinal nerve roots, leading to diminished function and illness. Through manipulation or adjustment of the spine, treatment seeks to analyze and correct these misalignments.

Reiki. Practitioners of this ancient Tibetan healing system use light hand placements to channel healing energies to the recipient. While practitioners may vary widely in technique and philosophy, Reiki is commonly used to treat emotional and mental distress as well as chronic and acute physical problems, and to assist the recipient in achieving spiritual focus and clarity.

Alternative medicine has been a source of vigorous debate, even over the definition of alternative medicine. It is considered that alternative medicine is based on untested, untraditional, or unscientific principles, methods, treatments . But a growing number of people are turning to alternative medicine and natural healing and even some mainstream doctors have begun to recommend natural drugless therapies to treat both everyday complaints and serious illnesses. So alternative approaches are often used in conjunction with conventional (official) medicine.[5]

There are numerous advantages of alternative medicine. But what to choose a prescribed medicine or alternative therapies -it's up to you to decide.

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A MODEL OF A MOODLE LISTENING COMPREHENSION COURSE FOR PROSPECTIVE INTERPRETERS

Introduction. An accurate and precise model of a Moodle listening course for prospective interpreters makes the process of accomplishing listening comprehension exercises easy and effective. Such a model is a scientifically based scheme that is aimed at the successful final result. **Purpose.** The purpose of the research is to characterize the process of creating a model of a Moodle listening comprehension course for prospective interpreters. **Methods.** Analysis, empirical research, study of the basic materials for the Translators/Interpreters' Department for "English as First Foreign Language" [3], mass survey of the students of the second course were used to

outline and describe the process of creating a model of a Moodle listening comprehension course for prospective interpreters.

Results. A model of a distance listening comprehension course for prospective interpreters placed in Moodle involves such components of the teaching process as *principles, an object, an aim, a subject, a discipline, means of realization, and the stages of the organization.* As any model of the educational process requires certain principles to be based on [2], we suggest the following *principles* to keep to: a systemic and systematic principle, a communicative principle, a principle of interconnection of the types of speech activities, and a principle of realization of the strategic actions.

A process of teaching prospective interpreters listening to such genres of audio texts as interviews, lectures, announcements, the news is the *object* of the education. The *aim* of the education based on the Moodle listening comprehension course is to make students acquire competence in understanding oral messages.

In the frame of our research the *subjects* of the education are the second-year prospective interpreters of English (III term). The model of a Moodle course is aimed at making the students acquire listening comprehension skills according to such semantic topics as "Mass Media", "Theatre", "Medicine and health".

The *means of realization* of the model are the following: authentic audio and video texts (interviews, lectures, announcements, the news) selected according to the primary and secondary criteria [1]; the system of exercises for development listening skills and strategies.

The Moodle listening comprehension course for prospective interpreters has been organized according to ECTS for second-year distance interpreters of Department of English Language at Kyiv National Linguistic University (III semester). The model comprises 48 hrs for lectures and 744 hrs for individual work.

For organization of our model it constitutes: lectures – 48 hrs (24 classes) : 4 = 12 hrs and for individual studies – 744 hrs : 4 = 186 hrs. During the III term prospective interpreters can listen to the audio texts of different genres the following number of hours: introductory course – 18 hrs (lectures) : 4 = 4.5 hrs, individual work – 744 hrs : 4 = 186 hrs, winter exams – 30 hrs : 4 = 7.5 hrs, where 1 hour is 45 minutes.

The model of a Moodle distance listening comprehension course for prospective interpreters can be realized during initial, basic, and advanced stages. At the *initial stage* the students comprehend and try to understand audio and video messages of different genres (interviews, lectures, announcements, the news) uploaded in an open-source software learning management system. The prospective interpreters follow the guidelines on the specific features of listening to each of the genres, learn how to take notes while listening to each of the genres, train their mnemonic strategies.

A *basic stage* of a distance listening comprehension course means accomplishing the exercises, analyzing the listening strategies of different genres; at

this stage students learn how to identify specific information, express their critical attitude, listen for details and listen for gist. The prospective interpreters work on the language material, analyze and interpret the parts of different audio texts, keep to a "Listening Comprehension Diary" applying strategies and strategic actions offered in the course. This stage is aimed at increasing the prospective interpreters' level of motivation, avoiding the students' misunderstanding of the interviews, lectures, the news and announcements. The distribution of the hours given for improving listening skills and strategies according to the genres during the inter-exam course is as follows: 186 hrs : 4 (genres) = 46,5 hrs.

At the *advanced stage* of the course the students improve their ability to listen to the texts of different genres and to do exercises aimed at: identifying specific information, critical or understanding attitude, listening for details and listening for gist. Besides, the students write a summary or a report on the issue in their mother tongue to improve their specific interpreting skills, complete a post-experiment listening comprehension questionnaire, select the necessary audio and video material to listen to and to watch, define the listening strategies on their own, apply the strategic actions to overcome the listening comprehension difficulties, improve the ability to use the strategies which are underdeveloped. There are 7,5 hrs (337,5 min) to teach students listening to the texts of different genres at the advanced stage

Conclusions. The Moodle listening comprehension course helps the prospective interpreters develop and improve their knowledge on listening strategies and peculiarities of audio texts of different genres. However, further research is needed to test the efficiency of the described Moodle listening comprehension course for prospective interpreters.

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MOTIVATION IN LEARNING OF ENGLISH LANGUAGE

Actuality of theme. The problem of self-motivation is the focus of the modern educational world. It plays a significant role in the progress in whole. It has also become a part of the process of learning a language.

The purpose is to find new and modern ways of self-motivation for English learners. To give them well-built reasons to start to learn a language or to improve the level they have.

Imagine the following situation: you enter the classroom as a teacher and all the students are

motivated to learn English today. The same situation would repeat every day. Would that not be awesome? Unfortunately it does not happen all the time. Actually it happens almost never. There is almost always one student who is not motivated because of reasons we cannot influence or change. Nevertheless there are some things we can change or influence when it comes to self-motivation of a student.

The results and discussion. Some students believe that the method of self-motivation depends on personality, features of character and student's habits. If you are strong enough and purposeful it will be easy for you to master any kind of activity, because you only need to determine the goal and you will do everything to reach it. But if you are not you can follow some psychological rules:

1. Just get started and let the motivation catch up with you.You don’t have to wait for motivation to get started. If you want to work in a consistent way every day then sometimes you just have to get going anyway. And the funny thing is that after I have worked for a while things feel easier and easier and more fun and the motivation catches up with me. [1].

2. Break a huge task down into very small steps and then take just one of them to start moving forward.

3. Get motivation from the people in your life. Spend less time with negative people who always look at the dark or apathetic side of things. And spend more of the time you have now freed up with enthusiastic or motivated people and let their energy flow over to you. [1].

4. Compare yourself to yourself and see how far you have come. Instead of deflating yourself and your motivation by comparing yourself to others who are so far ahead of you. [1].

International survey shows that the effectiveness of self-motivation in learning English depends on student's personal features and skills. You should find a way of

learning that you are most comfortable with, and something that you enjoy at the same time.

Here are some ways to start today:

1. Listen to music and learn *all* the lyrics

Everyone likes music. However, in order to learn English, you must stick to English songs**.**

Practicing with popular songs is always better because you always hear them playing even if you're in the car, the grocery store or the mall. You can also hear them on English radio stations online. As for the music genre, you may want to avoid rock and rap because the lyrics are often a blur(too fast or difficult to hear). It won't be good practice for your diction and pronunciation. [2].

2. Watch English videos about your interests

While you're already on YouTube, you can also watch YouTube videos.

This is good training for your English comprehension and communication. Watching interviews and reviews will help you become familiar with conversational English—how you should communicate with other people.

3. Speak English wherever you go

Practicing and learning English shouldn't stop at home or with people you know.

If you're in an English-speaking country and you're going to the mall to find a specific item, talk to a saleslady in English, and don't be nervous! To prepare, before you leave your house, **look up all the vocabulary you need to ask questions and buy your item**. This helps you explain what you want, and also helps you understand the answers that you'll hear.

As much as possible, try and speak English wherever you are and wherever you go, even if the person you're talking to isn't really fluent. It's all about communication! [2]

Conclusion. Self-motivation is a really tricky topic that is closely connected to the student's personality. That is why it is very important to develop yourself. So, don't put it off. Begin now.

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COMMUNICATION METHODS IN LEARNING FOREIGN LANGUAGES

Modern methods of communication are of great importance in teaching of the foreign language. The use of technology in education can be a great benefit for teachers.

Modern pedagogical science strives to use new technologies in teaching. Most of the wide variety of interactive educational software for learning English is aimed at independent elaboration of phonetic and grammatical aspects and making their use automatic. Features of these programs include interactive dialogues, speech recognition and visualization of pronunciation, animated videos showing articulation of sounds, exercises for development of all kinds of speech skills, videos with translation, and tracking one's own learning outcomes [1].

In our point of view, the aim of learning the English language is communicative activity, which requires practical language, the task of teachers is to revive all students in the learning process, in order to create a context for their creative activity. So that, the use of modern technologies allow us to solve these problems.

Multimedia technologies acting as a method for special intellectual activity. This technology has several advantages, as it allows: improvements in the process of organic combinations of traditional and innovative forms and methods of teaching, transition from education to self-education, creation of a positive emotional background for learning, effectiveness of as visibility and accessibility. The use of innovative teaching technologies create the most favorable conditions and contribute significantly to motivation in studying foreign languages.

A. Fitzpatrick, Director of the International Certificate Conference e.V., A. Lund, researcher at the University of Oslo, Norway, M. Warschauer, Vice Chair of the Department of Education at the University of California, Irvine, USA, noted that Multimedia can:

• enhance learning in different locations and institutions of diverse quality;

• present opportunities to students working at different rates and levels; provide (tirelessly, without holding up other students) repetition when repetition is warranted to reinforce skills and learning;

• compensate, in the short term, for high student populations and limited numbers of trained and experienced teachers – in combination with robust teacher development initiatives and improvements in teachers' working conditions [2].

In general, we agree, that multimedia can be a powerful tool for everyone to learn foreign languages through self-study, and allow close monitoring and ongoing operational support.

Basing on the research of English-language sources, we could come to the following conclusion that, in general, new methods of teaching foreign language will

provide a higher level of learning and improving communication skills in foreign languages. Internet sources that may come to the aid of foreign language teachers in the organization of independent work, include interacting with and searching in online resources, where cognitive information, training materials and conditions can be found that are conducive to the formation of professional competence for future specialists.

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ENGLISH SLANG IN THE UKRAINIAN LANGUAGE

The aim of this study was to investigate an influence of English slang in the Ukrainian language.

The words *viagrate, headdesk, technolust* and *attention spam* may sound incomprehensible for some people, mainly for those, who don't speak English much. But why do we hear them all around nowadays, especially from young generation? And where did these concepts come from?

To begin with, we should say, that in last decades West European and American impact has added lots of fresh ideas to our culture space. English has become the language called "Lingua Franca". It means that people all around the world use it in their daily life. Using Anglicisms has become a kind of a fashionable trend that is widely spread among young people.

Scientists distinguish several factors that have an influence on a growth of slang. Consequently, we have got a few slang groups.

First of all, development of computer sciences, IT technologies and computer games. The most common words you can hear out of this group are*: user, login, copypaste, noob.*

The second group is connected with modern music flows and "club kids" culture. Here we can name such words as*: release, remake, showbiz, face-control.*

The names of popular and sometimes new for our people kinds of sport are in the third group: *shaping, bodybuilding, fitness, footbag* and *cheerleading.* Also it is necessary to add the words connected with current rising popularity of diets and healthy food, such as*: lowcarb, vegan, smoothie and cordycept.*

The fourth and the most interesting section of modern English slang is Internet and Chat slang. For example, have you ever wondered what *Friendscaping*, *Crosstext* or *hashtag* mean? Nowadays Web space is full of these novelties. And this is only to start with. Furthermore, there are lots of abbreviations and shortenings such as: *LOL, IDK, BTW, jailbait, pal, Gee, ASAP, BRB,* etc.

In conclusion, it must be said that the process of using English slang in the Ukrainian language is growing very fast. It is spread almost in every sphere of our daily life. The most influential factors are Internet culture with its innovations and young people, who catch these introductions.

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STRATEGIEN DER VORBEREITUNG EINER DISKUSSION NACH DER PRÄSENTATION

Heutzutage kommen fast alle Berufstätigen in die Situation, präsentieren zu müssen. Denn bei vielen Entscheidungen im Berufsleben spielt nicht nur der inhaltliche Aspekt eine Rolle, sondern auch die Art, wie Inhalte präsentiert werden. So ist das Problem einer erfolgreichen Präsentation sehr aktuell. Praktische Erfahrungen zeigen, dass über Erfolg oder Mißerfolg einer Präsentation sehr oft die Diskussion entscheidet, die sich an eine Präsentation anschließt. Diese Diskussion ist die Gelegenheit, etwaige Mißverständnisse auszuräumen und weitere Überzeugungsarbeit zu leisten. Deswegen muß sie, ähnlich wie die Präsentation, gut vorbereitet werden.

Das Ziel des gegebenen Beitrags ist, die Rolle der Diskussion nach der Präsentation zu betrachten sowie entsprechende Strategien der Vorbereitung solch einer Diskussion darzulegen.

Die Bedeutung einer regen Diskussion über die während der Präsentation vermittelten Inhalte besteht darin, dass sie erstens von einem interessierten Publikum zeugt und zweitens ein Hinweis darauf ist, dass es gelungen hat, Interesse am Thema sowie an den vorgestellten Standpunkten zu wecken. Darüber hinaus bietet eine Diskussion die Möglichkeit, dem Publikum die Inhalte noch besser zu vermitteln, indem vieles, was von den Zuhörern aktiv diskutiert wird, sehr stark bei ihnen hängen bleibt [2]. Wie es bekannt ist, behält der Mensch durch Sehen, Hören und eigene Erarbeitung 90% des vermittelten Stoffs, während durch die rein passive Aufnahme ohne eigene Erarbeitung nur 50%. So spielt die Diskussion nach der Präsentation eine sehr wichtige Rolle als eine Chance für den Redner.

Dabei birgt aber die Diskussion andererseits natürlich auch die Gefahr, dass ein guter Vortrag durch einen schlechten Umgang mit kritischen Fragen oder destruktiv eingestellten Zuhörern entwertet werden kann. So muss man entsprechende Strategien bei der Vorbereitung einer Diskussion verwenden. Vor allem sollten

verschiedene Möglichkeiten vorab durchgespielt werden, um so weit wie möglich auf alles vorbereitet zu sein [1].

Eine wichtige Strategie für erfolgreiche Diskussion sind gut durchdachte Fragetechniken. Richtige Fragetechniken können dazu beitragen, eine schwierige Diskussion überlegt und souverän zu führen. Bei Fragetechniken ist Folgendes zu beachten:

- Wer fragt, der führt.
- Der Grund der Fragen muss erklärt werden.
- Die Fragen müssen motivierend sein.
- Rückkopplungs- und Steuerungsfragen lenken das Gespräch.
- Es ist besser, kurze Fragensätze zu benutzen und nur eine Frage zu stellen.
- Unbedigt sind Pausen zuzulassen.
- Offene Fragen sind bevorzugt.

Zu einer positiven und konstruktiven Diskussion trägt es auch bei, wenn Präsentierender gut und aufmerksam dem Publikum zuhört und die Diskussion durch Rückmeldungen und Zusammenfassungen strukturiert. In vielen Diskussionen und Gesprächen ist das Problem, daß man sich nicht sicher sein kann, ob man seinen Gesprächspartner richtig verstanden hat und ob man von seinem Gesprächspartner richtig verstanden wurde. So sind Rückmelden und Zusammenfassen eine weitere wichtige Strategie für erfolgreiche Diskussion. Rückmeldungen sind produktiv, wenn sie sachlich und interpretationsfrei formuliert sind, konkret sind und rechtzeitig erfolgen [1].

Schwieriger ist es, bei den Diskussionen mit sachlichen Einwänden umzugehen. Da braucht man auch bestimmte Strategien. In erster Linie sollte man Ruhe bewahren und seiner guten Vorbereitung sowie seinem Wissen vertrauen. Zweitens muss man dem Gesprächspartner gut und aktiv zuhören und den ausreden lassen. Drittens muss man sich vergewissern, daß der Einwand richtig verstanden ist. Erst danach muss man ruhig und sachlich antworten. Beim Umgang mit Einwänden sind folgende Grundprinzipien einzuhalten [2]:

- zutreffende Einwände gelten lassen;
- nicht allwissend sein wollen;
- nicht auf jeden Einwand eingehen;
- wenn man auf einen Einwand eingeht, nicht mit «Nein» beginnen;
- Verständnis für den Einwand zeigen;
- nach Alternativen fragen.

Zusammenfassend ist zu betonen, dass man dem richtigen Verhalten bei der Diskussion nach der Präsentation sehr große Aufmerksamkeit schenken muss als einem wichtigen Instrument der erfolgreichen Präsentation. Von besonderer Bedeutung ist dabei richtiger Umgang mit Fragen, Rückmeldungen, Zusammenfassungen und Einwänden.

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UNDERSTANDING YOUTH TATTOOING: SOME SOCIAL PSYCHOLOGICAL ASPECTS

Although there are no statistics on tattoo prevalence in Ukraine, observation expressly reveals that tattoos are rising in popularity, in particularly in adolescents. The study aims at determining reasons for getting tattooed in young people.

Tattooing has evolved from the art of the primitive and outlaws to the fashion mainstream. In primitive societies, tattoos were indelible marks of tribe or of status and signified a difficult passage to adulthood or identified the owner's skills. In modern societies tattoos are generally regarded as forms of individual expression and creativity. But while tattoos glorify self-expression, they still identify tattooed individuals as members of a tribe – the community of those who worship body art.

One of the most popular reasons for getting tattooed is to adorn the body [1, p. 83]. Tattoos can also manifest rebellion and independence from adults. The latter reason for getting tattooed is especially common among teenagers and adolescents. When seeking to assert independence, young people may regard tattoos as a way to rebel against and reject authority figures and mainstream values, or to ground a sense of self in an unsecure world. Tattoos can be a means by which a young generation can commemorate the important events of their lives. In getting tattooed a lot of young people can be inspired by numerous celebrities, musicians, sportsmen who have visible tattoos. While some individuals perceive tattooing as a means of individualization, tattoos have themselves become a mass consumed commodity.

Men are more likely to use tattoos to reinforce traditional notions of masculinity, whereas women traditionally both defy and reproduce conventional standards of femininity [2].

To understand reasons for getting tattooed a survey was conducted among the university students. The sample was represented by 37 students of ages ranged from 17 to 25. The questionnaire included 15 Likert scale-based questions. The statistical analysis of the data obtained revealed that the main reasons for getting tattooed in adolescents are identity (4,75), fashion (4,05), art (3,75) and group affiliation (2,83).

However, the message that a person intends to communicate through tattoo is not always the message received by others [3, p. 91]. Despite their increasing popularity, tattoos still carry stigma and can provoke discrimination. Tattooed individuals can be mistakenly perceived as gang members, drug users or troublemakers. Tattoos can also create tension in interpersonal relations.

Thus, for adolescents tattoos serve as a means to express themselves through the appearance of their bodies. The tattooed body is a kind of canvas to depict a

struggle between conformity and resistance, superiority and inferiority, individualism and collectivism. Tattoos are powerful vehicles of self-expression, commemoration, community affiliation and social commentary. At the same time, tattoos can be limited by misinterpretation and stigmas attached to tattooed young people. Among the main reasons for getting tattooed adolescents name identity, fashion, art and group affiliation.

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DIFFERENCES BETWEEN AMERICAN AND BRITISH ENGLISH

«England and America are two countries
separated by a common language»
George Bernard Shaw

The English language was first introduced to the Americas by British colonization, beginning in 1607 in Jamestown, Virginia. Similarly, the language spread to numerous other parts of the world as a result of British trade and colonization elsewhere and the spread of the former British Empire, which, by 1921, held sway over a population of 470–570 million people, approximately a quarter of the world's population at that time.

Over the past 400 years the form of the language used in the Americas—especially in the United States—and that used in the United Kingdom have diverged in a few minor ways, leading to the versions now occasionally referred to as American English and British English.

Differences between the two include pronunciation, grammar, vocabulary (lexis), spelling, punctuation, idioms, and formatting of dates and numbers, although the differences in written and most spoken grammar structure tend to be much less

than those of other aspects of the language in terms of mutual intelligibility. A small number of words have completely different meanings in the two versions or are even unknown or not used in one of the versions. One particular contribution towards formalizing these differences came from Noah Webster, who wrote the first American dictionary (published 1828) with the intention of showing that people in the United States spoke a different dialect from Britain, much like a regional accent [1].

As the most-spoken second language on the planet, English has to be flexible. While there are certainly many more varieties of English, American English and British English are the two varieties that are taught in most educational programs. Generally, it is agreed that no one version is "correct" however, there are certainly preferences in use.

The three major differences between between American and British English are:

Pronunciation – differences in both vowel and consonants, as well as stress and intonation

Vocabulary – differences in nouns and verbs, especially phrasal verb usage and the names of specific tools or items

Spelling – differences are generally found in certain prefix and suffix forms

The most important rule of thumb is to try to be consistent in your usage. If you decide that you want to use American English spellings then be consistent in your spelling, this is of course not always easy — or possible. The following guide is meant to point out the principal differences between these two varieties of English.

Written forms of British and American English as found in newspapers and textbooks vary little in their essential features, with only occasional noticeable differences in comparable media (comparing American newspapers with British newspapers, for example). This kind of formal English, particularly written English, is often called "standard English".

The spoken forms of British English vary considerably, reflecting a long history of dialect development amid isolated populations. In the United Kingdom, dialects, word use and accents vary not only between England, Northern Ireland, Scotland and Wales, but also within them. *Received Pronunciation* (RP) refers to a way of pronouncing standard English that is actually used by about two percent of the UK population. It remains the accent upon which dictionary pronunciation guides are based, and for teaching English as a foreign language. It is referred to colloquially as "the Queen's English", "Oxford English" and "BBC English", although by no means do all graduates of the university speak with such an accent and the BBC no longer requires it or uses it exclusively. The present monarch uses a hyperlect of the Queen's English [2].

Regional dialects in the United States typically reflect some elements of the language of the main immigrant groups in any particular region of the country, especially in terms of pronunciation and vernacular vocabulary. Scholars have

mapped at least four major regional variations of spoken American English: Northern, Southern, Midland, and Western. After the American Civil War, the settlement of the western territories by migrants from the east led to dialect mixing and levelling, so that regional dialects are most strongly differentiated in the eastern parts of the country that were settled earlier. Localized dialects also exist with quite distinct variations, such as in Southern Appalachia, Boston and the New York City area.

British and American English are the reference norms for English as spoken, written, and taught in the rest of the world, excluding countries where English is spoken natively such as Australia, Canada, Ireland and New Zealand. In many former British Empire countries where English is not spoken natively, British English forms are closely followed, alongside numerous AmE usages which have become widespread throughout the English-speaking world. Conversely, in many countries historically influenced by the United States where English is not spoken natively, American English forms are closely followed. Many of these countries, while retaining strong BrE or AmE influences, have developed their own unique dialects, which include Indian English and Philippine English. [3]

Chief among other native English dialects are Canadian English and Australian English, which rank third and fourth in the number of native speakers. For the most part, Canadian English, while featuring numerous British forms alongside indigenous Canadianisms, shares vocabulary, phonology and syntax with American English, leading many to recognize *North American English* as an organic grouping of dialects. Australian English likewise shares many American and British English usages alongside plentiful features unique to Australia, and retains a significantly higher degree of distinctiveness from both the larger varieties than does Canadian English. South African English, New Zealand English and the Hiberno-English of Ireland are also distinctive and rank fifth, sixth and seventh in the number of native speakers.

So, despite there are a number of differences in both form of English, it is still one language which we all should learn and improve more and more. When you are learning English as a foreign language, it is important to understand these differences. Mixing the two varieties will make your English sound strange and unnatural so it is best to choose just one and use it all the time. There is no «better» or «worse» form of English and both Britain and American have their advantages depending on how and where you intend to use the language.

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LINGUISTIC MEANS OF PERSUASION IN THE INTERNET-ADVERTISEMENT

The central issue in the article is linguistic means of persuasion. The development of Internet technologies has led to the base of our researching. The paper focused on slogan classification according to different features in linguistic meaning. In addition to this, research includes many slogan examples for proving the hypothesis of this article. The results of researching show us that modern Internet-advertisement is a great tool of manipulation of human mind.

We cannot imagine the modern world without advertising. It is everywhere: it “shouts” to us from title pages of newspapers and magazines, from banners and store signs. It is like a virus absorbing radio, TV, and Internet.

Internet-advertisement is becoming so popular nowadays. First of all, it may be related to a furious pace of development of innovative technologies. Furthermore, companies’ costs on Internet-advertisement are the much smaller than costs to other means of advertising dissemination.

The “rising” of Internet-advertisement is linguistic means of persuasion. That is why, the purpose of our research is the learning of linguistic means of persuasion in the modern Internet-advertisement. The novelty of our researching is identical with issue of that one.

One of the most promising tasks of the paper is researching and analyzing slogans of modern English Internet-advertisement and defining the structure and functions of advertisement text.

In recent years, researchers have become increasingly interested in that issue. Among them there were Dridze T. M., Bulygina T. V., Vereshchagin E. M., Stepanov S. Yu., Alekseeva I. S., Medvedev E. V., Koptev N. N., Cohen D., and many other scientists [1].

We may divide the advertising text into structure parts as the title, the slogan, the main text and the phrase-echo. The slogan is a short phrase, which reflects the main idea of the advertising text. Slogan must take us fresh information, shortly and briefly describe it using a few words [1].

Let us characterize slogans like a heart of every advertisement. If we characterize slogans for separate spheres of people’s life, we will see many common traits. Slogans about fashion tell us that their production exactly underlines your beauty, makes you more perfection and confident at yourself [2, p. 308].

For example:

- *Maybe she’s born with it. Maybe it’s Maybelline. (Maybelline)*
- *For successful living. (Diesel)*
- *Just do it. (Nike)*

- *Because you're worth it. (Loreal)*

The companies that sell food production as usual try to emphasize on the taste and fresh of that one:

- *Eat Fresh! (Subway)*
- *Probably the best beer in the world! (Carlsberg)*
- *Good to the last drop. (Maxwell House Coffee).*

The further investigation is needed to characterize the advertisement from the side of Morphology. The combination of nouns with adjectives like fresh, successful, favourite, best, and others makes it more melodious and underline the quality of that production.

- *Pure Life. (Nestle)*
- *America's Favorite Pizza. (Pizza Hut)*
- *The world's favourite airline. (British Airways)*

The adjectives of reinforce assess the function of slogans. That is why, we often can see the adjectives of Superlative degree.

- *The happiest place on Earth. (Disneyland)*
- *Something special in the air. (AA)*

Using the Pronoun "I" and "WE" create the specific conditional link between the addressee and the sender. That allows us to feel ourselves unique or the uniqueness of this production. The attention paid to everyone individually has always interested users.

- *I swear by Shell. (Shell)*
- *We're number two. We try harder.(Avis)*
- *We keep your promises. (DHL)*

The texts of advertisings can use different linguistic means such as metaphors, alliterations, the epithets, tautologies, or even oxymoron.

- *Skittles..taste the rainbow. (Skittles)*
- *Nicorette, nicorette, you can beat the cigarette! (Nicorette)*
- *A taste of paradise. (Bounty)*
- *I am what I am. (Reebok)*
- *Impossible is nothing. (Adidas)*

Sometimes slogans are used like proverbs or sayings.

- *Good Thing Come To Those Who Wait. (Guinness)*
- *Keep Walking. (Johnnie Walker)*

Many slogans are created by the principle of simplicity, like these:

- *Just do it! (NIKE)*
- *What else? (Nespresso)*
- *I'm lovin' it. (McDonald's)*

Moreover, modern slogans are too original and creative. It is wordplay.

- *WASSSSSUP?! (Budweiser)*
- *Schhh! You know who? (Schweppes)*
- *The Uncola. (7up)*
- *Live on the coke side of life. (Coca Cola)*
- *Have a Pepsi Day! (Pepsi)*
- *Hungry? Grab a Snickers. (Snickers)*

To sum it up, we have concluded that modern Internet- advertisement is the tool of manipulation of human mind. However, it is a convenient and effective way of disseminating information. That is why, we must be careful and be ready to see a real quality of the product behind advertising.

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THE PROBLEMS OF HEART TRANSPLANTATION

A **heart transplant**, or a **cardiac transplant**, is a surgical transplant procedure performed on patients with end-stage heart failure or severe coronary artery disease when other medical or surgical treatments have failed. The patient's own heart is removed and replaced with the donor heart. Heart transplantation is not considered to be a cure for heart disease, but a life-saving treatment intended to improve the quality of life for recipients.

The first heart transplant from animal to human was performed in 1964 by James Hardy. It was the heart of a chimpanzee; the patient lived an hour and a half.

First successful transplant of a human heart made Christian Barnard in 1967. Despite the fact that the operation was carried out perfectly, patient lived only 18 days and died because of pneumonia.

Worldwide, about 3,500 heart transplants are performed annually. The vast majority of these are performed in the United States (2,000–2,300 annually).Cedars-Sinai Medical Center in Los Angeles, California, currently is the largest heart transplant center in the world, having performed 132 adult transplants in 2015.

Matching Donor and Recipient - severity of illness ,same ABO blood type ,donor weight must be close to recipient`s, geographic location relative to donor, length of time at current status.

Care of heart transplant patients after surgery

Short- and long-term management of cardiac transplant patients involves cardiac support, as well as monitoring and treatment of rejection, infection, and malignancies.

Post-operative complications include infection, sepsis, organ rejection, as well as the side-effects of the immunosuppressive medication. Initiation of medications, particularly immunosuppressive agents begins on the day of the operation.

Outcomes

- Survival rates for people receiving a heart transplant have improved over the past 5 to 10 years - especially in the first year after the transplant.
- About 88 percent of patients survive the first year after transplant surgery, and 72 percent survive for 5 years.
- The 10-year survival rate is close to 50 percent, and 16 percent of heart transplant patients survive 20 years.
- After the surgery, most heart transplant recipients (about 90 percent) can come close to resuming their normal daily activities
- Similar survival rates between men and women.

Transplantation of mechanical heart done in Ukraine for first time ever

A mechanical heart has been transplanted into a patient in Ukraine - the very first time such an operation has been conducted in the country in 2016. This is according to Borys Todurov, the head of Ukrainian Heart Center clinic in Kyiv and a renowned heart surgeon. He says, the implant allows patients with difficult heart conditions to survive and wait for the needed donor organ. The device has no expiration date, and some people have lived for more than 8 years with it already.

On October 16th, 2016, the second operation of mechanical heart implantation was successfully performed to save the life of Lyudmyla Filarenko. The operation was performed by the Heart Institute team under the leadership of the Institute's General Director, cardiac surgeon Boris Todurov.

Problems with the transplantation of organs in Ukraine relate to transplant from a living person and the dead. According to the Ukrainian legislation from a living donor organ can be transplanted only to his relative or husband/wife. The only exceptions are biological materials that are regenerated, for example, bone marrow. Moreover, to take an organ from such a donor can only after obtaining his written consent.

Even more difficult situation in Ukraine with cadaveric donation – transplantation of organs from a deceased person. In Ukraine, a so-called "presumption of disagreement" – if the person has not given written consent to donation after death, his organs can be used only after the consent of his relatives or wife/husband.

I think it is very indicative of the experience of Belarus. There exists a presumption of consent, so every person become a donor automatically. And if person does not agree, in advance (for life) put data in the register of dissent.

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NATIONAL MOTIFS IN MODERN UKRAINIAN CLOTHES AS A MEAN OF A PATRIOT'S CONSCIOUS MENTALITY FORMING

Each successive generation of people live in a specific national environment, whose life depends on the particularities of the state. socio-economic conditions, national characteristics, namely: the mode of life, culture, customs and traditions affection people from their birth. A person takes over from the ancestors the features of the native language, a sense of affection and sympathy for the spirituality of his people, graduallygets used to established social norms. All this leads to formation the special features of national psychology - mentality, which becomes the basis for the citizen-patriot breeding.

The civic position the conscious Ukrainian has to be manifested in the active defending of the traditional for our mentality love to native land, sociability, reasonable sufficiency, values of family life, spirituality of everyday life, and careful attention to people.

In a public environment, there are several things which people cannot live without, and the most important among them - are water, food and clothing.

But each nation has its own opinion on what to prefer.The national dress for Ukrainians is an expression of national identity, ethnic definition and a mean of their formation. Clothing has a distinct landmark and defines the ethnicity of the person. It creates a character, embodies the aesthetic ideal of the Ukrainian nation. People find it asthe ethical expression and presentation. Clothing has been created for centuries, so it embodies the history of the people and national values. Nowadays national dress is a sign of the conscious national determination that is an expression of patriotic feelings.

In encrypted form, Ukrainian national clothes show the national systemof values, the component and the expression of which is themselves. Conscious choice of national clothing is largely linked not only with the recognition of its aesthetic valuebut also with a conscious choice of national values and demonstration of its belonging to a certain ethnic group.

As an example of this statement we can give as an example our contemporaries who left the country for various reasons and now are abroad. What unites them at this difficult for Ukraine time it's not only Ukrainian language, but also embroidered national costumes they wear. So it's natural that the struggle of the Ukrainian people for their independencefinds a revival in national culture and is manifested in clothing. The revival of folk costumes and use its elements in fashionable clothes were and arethe waysof expressing patriotism, which affects the development of national consciousness.

But onthe national background if often happens a substitution of the real values of our folk culture into poor quality clothes which speculate on national grounds, so-

called "market place" fashion, embroidery dresses, which were created in non-Slavic countries. The problem is not only in quality of these garments, but especially the spirit that is laid in the process of their creation. As Wikipedia says, ".. primitive costumes of the Cossacks and girls wearing plasticwhisks with ribbons" that is "sharovarschyna" - a victory of a form over a content". "Sharovarschyna" especially actively developed and was fancy to Soviet authorities at the time of our grandparents'youth. The Motive ofauthority was clear: the control ofthe art, and roll the dice for those who wanthear, see and do their own. The culture under the total control gave mostly pervertedfruitwhich to our high regret we still can feel sometimes.

Despitethis, inexhaustible treasury of folk art and national traditions always inspired designers, artists and couturiers to create festive and casual clothes with folk motifs. Now we have a time when we can do and wear traditional clothing, embroidered items (real or stylized folk embroidery) with any reason, simply by the call of heart.

The promotion and popularization of folk clothes as a national symbol occurs among the Ukrainian intelligentsia. People's clothes, or parts of it, especially an embroidered shirt became an expression of patriotic, democratic convictions. And a pioneer in this was a writer, Ivan Franko. He was first on the brink of XIX - early XX century who combined embroidered shirt with a business suit.

A. Kulchytska, the artist, was one of the firsts to design clothes with folk motifs. In 20-30 years of the 20th century she organizedthe work of clothesmodeling in traditional style, introducing elements of folk costumes in an everyday and a festive costume. In the Soviet Union a folk dress style appeared at the beginning of the Khrushchev's "thaw". Folk motifsbegan to appearin clothingin 60 years. First of all, as the eccentric details - folk style embroidery on any item of clothingappeared on self-sewn or knitted clothing;plaid skirt;a vest with stylized folk ornament; a scarf linked in a special way; braided leather belt; coral or red wooden beads. These elements providedclothing with a national nuance and to some extent were a manifestation of the desire of national self-expression. The suit of "Sixties" - Ukrainian dissidentshad itsown features. The using ofUkrainian folk costumeselements, original things, namely, embroidered shirts for men and women; Ukrainian colorful scarveswere the characteristics of their clothing.

In the 70 years of the last century it was the revival of Ukrainian culture, despite the fact that it was a period of "stagnation" .Ukrainian films, books, art exhibitions aroused an interest to Ukrainian culture of Ukrainian indigenousas well as representatives of other nationalities. It became popular to additems of Ukrainian national costumeto clothing. The characteristic features of Ukrainian national clothes - precision molds, colorfulness - suited the trends of European fashion of 70 yearsat that time. Varieties of Ukrainian national clothes - embroidered shirts, vests, coats, bags, jewelry beads fitted in the stock of clothes of those times. Creative young people, some modelers of fashion houses provided national character to clothingby color matching, using some details such as ornaments, furniture, clothing supplements.

It was a manifestation the desire for uniqueness and national self-determination. Mostly folk items of clothing were accompanied with an interest to Ukrainian culture and history. Immigrants from rural sawthe folk style as a natural expression of national feelings. It was another trend –the interest to Ukrainian culture, which manifested in the capture of folk culture, folk style clothing and led to the conscious perception of national values.

In the 90 years supporters of the Ukraine independence dressed in original folk costumes or included their elements, namely: embroidered shirts, plakhtas, scarves and so on. Yellow and blue ribbons and embroidered shirts, which served as a symbol of support for the Ukraineindependence,were used. National motifs became prevalent in the collections of Ukrainian designers of clothing at that time. Among the wide variety that offers clothing with national motifs will always be popular. The most popular today is the embroidered shirt in all its varieties. Its trendy, stylish, it'sfor men and women, it is always topical.It is perfect for holidays and daily use. Today there are many different ways of creating embroidery for holidays and for work. Embroidery is a dress code or free admission to some youth parties and discos.

Every citizen should be able to reproduce the national dress in forms or traditional or modernized, suitable for the present society, lifestyle, regardless of age and a social class. The practice of European countries has shown and proved that the national dress plays an important role in stimulating patriotic feelings of citizens. So this experience should be used Ukrainian designers and modelers.

Every year in many cities of Ukraine and in world capitals a collection of clothes are on display, models created by Ukrainian folk motifs are gaining more and more popularity and recognition not only by Ukrainians, but also international celebrities, actors, musicians, politicians. Ukrainian national patterns subdued world fashiondesigners whohave been getting an inspirationfrom the Ukrainian folk motifs for many years.

For usan embroidered shirt - is not just a fashion item, but quoting American Vogue, "after all Ukrainian eventsan embroidered shirt - is a kind of idea of association", Unity not only the East or West parts, but the unity of generations.

So, experience has shown and proved that folk motifs in clothing play a significant role in educating and stimulating of patriotic feelings of citizens of Ukraine. To strengthen the Ukraine each of us should realize that we are the citizens of this country. The most striking aesthetic, visual display is our nationalclothing, symbolizing Ukraine as a whole. And its research, promotion, converting is a necessary element of being citizen of Ukraine is an important task of the present and future designers and constructors-modelers.

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THE MOTIF OF THE LOSS IN TAYEB SALIH'S NOVEL "SEASON OF MIGRATION TO THE NORTH"

Last decades, the number of literary related to the deep analysis of works of literature has significantly increased. It is known that in 2001 the Arabic Literature Academy selected Tayeb Salih's novel "Season of Migration to the North" as the most important Arabic novel of XX century.

The novel of Arabic writer "Season of Migration to the North" was selected as a subject of research based on the fact that this work combined traditional elements of the author's worldview and artistic thinking, as well as new elements that led to the creation of a completely different, compared to the previous works, type of novel.

Tayeb Salih is best known as a "political" writer, who in his works explored the conflict between East and West, as well as between the colonizers and the oppressed. But in addition, works of Sudanese writer are known for subtle psychological analysis. A characteristic feature of his artistic personality was a smooth combination of Sudan folklore and African mythology with modern

techniques of modernist movements, in particular — the “stream of consciousness”, i.e. the author’s ascent to the philosophy of existentialism.

This work marks the apogee of the postcolonial novel in Arabic prose. The author focuses on the fight between the culture of Europe and the Arab-African countries. At the same time, we can follow an existential problem of man's place in a modern society. In the novel, the author focuses on the conflicts associated with the contradistinction of East and West, men and women, Christians and Muslims, Eros and Thanatos, tradition and modernity, towns and villages.

As an example of postcolonial novel, “Season of Migration to the North” is the story of two overlapping personalities who are trying to find themselves in their own country after a long period of time spent in the Western world. The author demonstrates some adherence to Edward Said’s theory of oriental images or stereotypes, when directly or indirectly criticizing colonialism. Through intertextuality, Tayeib Salih parodies previous European and Arab texts that describe cross-cultural conflicts between Europe on the one hand and Africa and the Arab world on the other hand; he undermines the colonialist views and statements in European texts.

Thereby, the psychological approach of understanding helped to draw the conclusion that it is impossible to evaluate the hybrid nature of all cultures and intercultural experience if not to consider things from the point of view of a hybrid; thus, “Season of Migration to the North” refers to the inevitability of double identity and culture as a result of cross-cultural encounters.

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WHAT LANGUAGE TO LEARN: BRITISH OR AMERICAN ENGLISH

English is considered to be one of the most popular languages in the world. It is the native language for more than 400 million people of our planet, and at least one billion people can speak English fluently. Obviously, as a result of different historical events and different cultural characteristics various dialects of the English language appeared. Surely, all people have repeatedly heard about the most popular language version – American English. How and why does it differ from the “original” British English?

It is necessary to turn to history to answer this question. In the 17-18 centuries in the United States there were a huge number of immigrants who arrived from England, Spain, Germany, France, Norway, Sweden and other countries. For people, who went to explore unexplored territories, it was necessary to be engaged in production, to establish trade, to create optimal socio-economic conditions. That is

why people needed one common language to achieve common goals. However, refined English, which aristocrats used in Britain, was not transferred to America. People needed a practical, accessible and understandable language. British English was changing for years and centuries and, as a result, American English, that differs a lot from British, was created.

The changes can be found in different aspects of the language. To begin with, there are changes in phonetics. American English is sharper and faster due to specific features in pronunciation. Let's consider some of them:

- the sound [a:] is replaced by the sound [æ]. For example: *class [klӕs], bath [bӕθ], last [lӕst]*.
- in the sound [ju:] after consonants [j] almost disappears. Often USA's residents pronounce the words *duty* and *student* as *[`du: ti]*, *['stuːd(ə)nt]*.
- the sound [r] is spoken out regardless of its location in words. For example: *car [kaːr]*, *port [pɔːrt]*.
- Americans often don't pay attention to diphthongs. For example, the word *fate* can sound like *[fe:t]*.

How can such differences be explained? As already mentioned above, American English was formed under the influence of the languages and dialects of immigrants from different countries of the world. People often neglected traditional phonetic rules. British English is subject to a single Received Pronunciation. But there are various regional standards in the United States of America.

Vocabulary is also very important. The differences in the lexical composition of American and British English can confuse a person even with an excellent level of knowledge. The catch is that some words and phrases exist in both versions of the language, but they don't have the same meaning. For example, in America the word *pants* denotes *trousers*, in the UK - *the item of underwear*. Due to ignorance of the differences, one can get into a very awkward situation.

In addition, different words are used to translate the same Ukrainian words into British and American English. For example, in the USA "цукерки" are called *candies*, in the UK - *sweets*.

When studying the language, one should pay attention to some subtleties. In British English, the word *holiday* is used to refer to "свято, відпустка, канікули". In the United States, this word means only "свято", the word "відпустка" is translated by the word *vacation*.

Another serious topic is grammar. From the grammatical point of view, it can be said that American English tends to simplify forms. Americans don't complicate sentences by using the Present Perfect Tense, even with such classic time markers as "just, already". They use Past Simple, but the British consider that this using is erroneous and will necessarily say such sentence in Present Perfect. For example, the sentence "Він щойно прийшов" in the British version will sound "He has just arrived". The Americans will formulate it as "He just arrived".

And finally. What kind of English should we learn? Of course, it all depends on the circumstances, but, there is no need to learn American English if you do not live in the USA. That is why it is definitely recommended to learn British English. Let's name some arguments in favor of this decision:

• British English is universally recognized. It is necessary to study it for passing the majority of standardized international tests. You can rest assured that with the knowledge of British English you will be understood anywhere in the world.

• British English allows you to form a complete understanding of grammar. Studying complex rules, you can easily use various designs in any situation.

• British English is more diverse than American English. You have a great opportunity to significantly expand the lexical stock and make your speech much richer. In addition, the opportunity will open to freely read your favorite English books in the original.

Many modern language centers and English teachers offer various programs for studying British and American English. If there is a desire to get acquainted with both options, it is better to begin with classical British English.

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IN THE SEARCH FOR UNITY

Family is the oldest institution of human interaction. It's a community where several people closely interact throughout life. Family is a small social group based on marriage and kinship. The members of the same family are tied emotionally. They are linked by a common life, moral responsibility, and mutual assistance. [1]

A traditional family according to a stereotypes and folks philosophy is a Patriarchal institution in which the structure consist of a male father, a female mother and children.

Diverse data from ethnography, history, law and social statistics, reveals the human family as a social institution and not as a biological fact founded on the relationship of consanguinity. The different types of families occur in a wide variety of settings, and their specific functions and meanings depend largely on their relationship to other social institutions.

The term “blended family” or “stepfamily” describes families with mixed parents: one or both parents remarried, bringing children of the former family into the new family. Also in sociology, particularly in the works of social psychologist Michael Lamb, traditional family refers to "a middleclass family with a bread-winning father and a stay-at-home mother, married to each other and raising their biological children," and nontraditional to exceptions from this rule.

There are a lot of different types of family relation. Traditional family is:

- Conjugal (nuclear or single) family
- Matrifocal family
- Extended family

Most of the US households are now non-traditional under this definition. They are:

- Monogamous family (based on legal or social monogamy. an individual has only one (official) partner during their lifetime or at any one time (i.e. serial monogamy).This means that a person may not have several different legal spouses at the same time)
- Polygamy is a marriage that includes more than two partners. If a marriage includes multiple husbands and wives, it can be called polyamory.
- Polygyny is a form of plural marriage, in which a man is allowed more than one wife. In modern countries that permit polygamy, polygyny is typically the only form permitted. Polygyny is practiced primarily (but not only) in parts of the Middle East and Africa; and is often associated with Islam; however there are certain conditions in Islam that must be met to perform polygyny.
- Polyandry is a form of marriage whereby a woman takes two or more husbands at the same time. Fraternal polyandry, where two or more brothers are married to the same wife, is a common form of polyandry. Polyandry is most common in societies marked by high male mortality or male absenteeism.

All social institutes have many pros and contras. If we speak about monogamy, two partners must have common views to main questions such as to be or not to be. But our world is so huge, varied and unknown. Some people cannot find a partner just for themselves. So, to my mind, polygamous relation it is a way to satisfy a lot of personality needs and wonderful possibility to give and get as much love as possible.

"Polygamy" is more often used to refer to codified forms of multiple marriage (especially those with a traditional/religious basis), while "modern polyamory" or "egalitarian polyamory" implies a relationship defined by negotiation between its members, rather than by cultural norms.

Values in polyamory

- Fidelity and loyalty;[2]
- Communication and negotiation;
- Trust, honesty, dignity, and respect;[3][6]
- Boundaries and agreements;
- Gender equality;

- Non-possessiveness

As with many non-traditional life choices, there is considerable active discussion about philosophical approaches to polyamory.

In 1929, *Marriage and Morals*, written by the philosopher, Nobel Prize winner Bertrand Russell, offered a strong precedent to the philosophy of polyamory. At the time of publication, Russell's questioning of the contemporary notions of morality regarding sex and marriage prompted vigorous protests and denunciations. [4]

In Echlin's article in *The Guardian*, six reasons for choosing polyamory are identified:

- a drive towards female independence and equality driven by feminism;
- disillusionment with monogamy;
- a yearning for community;
- honesty and realism in respect of relational nature of human beings;
- human nature and individual non-matching of the traditional monogamous stereotype.

There is no right or wrong answer when it comes to what is the best type of family structure. As long as a family is filled with love and support for one another, it tends to be successful and thrive. Families need to do what is best for each other and themselves, and that can be achieved in almost any unit. Suum cuique.

So, as a conclusion we must say that our century is characterized by revolution in traditions, a lot of new streams in social institutes and times of impermanence.

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CULTURAL, EDUCATIONAL AND ECONOMIC ASPECTS OF THE NAZI "NEW ORDER" (THE OCCUPATION OF THE TOWN OF BERDYCHIV IN 1941-1944)

Cultural and educational features of the Nazi "new order" are described in the historic documents. It's particularly interesting to follow the evolution of the occupants' attitudes to the education of native citizens of Berdychiv.

At the beginning of the occupation, an announcement was published about admission to male and female gymnasiums in the town of Berdychiv. The newspaper *Nova Doba* on July 19, 1941 states: "Pupils of the former Soviet secondary schools of all nationalities, except Jewish, are accepted" [14].

Secondary school for boys was accommodated in a former Teachers' Institute (49, Bilopilska Str.) and for girls – in ~~the~~ school No. 21 (7, Pushkin Str.) [14]. In addition, there were reports about the opening of the seven-year school [8].

The main task of the new German authority was to create a new school similar to the German school system [8]. The educational aim was revealed in an editorial article on January 23, 1943: "In the past we were taught astronomy and philosophy. What is the use of them now? Isn't practical craft better than scientific knowledge which cannot be helpful to start anything (business)?"[10]. This statement proves the racial policy of Hitler which was aimed only at unpaid manual labour but not intellect which was the privilege of the superior race: Aryans.

On the pages of the newspaper we can see the instructions concerning the decoration of schools: the slogan "Glory to Ukraine", and in the centre is Hitler's portrait. The pages of the newspaper appeal to learn German in contrast to Russian, which was to be superseded.

But since 1942, the general secondary school education was changed into 4 years of elementary school by the Reich Commissariat. In this regard, on July 1, 1943 in Berdychiv district the resolution "on compulsory education in public schools" was adopted. It stated that all children at the age of 7 are subject to compulsory education in public schools. The course of study lasts 4 years. Paragraph 4 of the resolution noted that "in school and out of school, the pupils must behave politely, with respect to the German authorities, to meet all the requirements of the German authorities and the local Ukrainian institutions" [7].

According to data submitted in January 1943, there were 41 elementary schools in Berdychiv district and 8 schools in Berdychiv, among them only one was a seven-

year school. It was noted that the percentage of pupils who visited them was low. This is confirmed by an article from January 23, 1943, "We are not satisfied with anything. When the Germans opened schools last autumn, our children did not go to them "[9].

This sentence confirms indirectly that the loyalty of the population to the Nazi “new order”, and especially after the Battle of Stalingrad, decreased greatly.

In the same issue the editor published an article which describes the methods used by Ukrainian police. They demanded from the native population foodstuffs, vodka and money. It is interesting that the author explained bribes as the legacy of the Jews which means that bribery was a holdover of the Jewish-Bolshevik past [9].

During the occupation period, Berdychiv had a working "Apollo" theatre [2, p. 127]. Besides a paid municipal library on the premises of the Historical Museum (23, Carmelite Str.), a home for the disabled was opened. This was done for propaganda purposes to communicate "we are not conquerors but liberators." Therefore, some cultural and educational institutions continued their work during the occupation period.

In 1942 the Nazi leadership began to implement the basic idea of the plan "Ost" i.e., German colonization of population.

According to the order of the Reich commissar of Ukraine from October 15, 1942 to the South of Zhytomyr and in the northern part of Berdychiv district an area which was called "hehevald" was allocated. It was planned to be settled by immigrants from "volksdeutsche" only [1].

However, despite Nazi rule, the population resisted this process which can be confirmed by the announcement of the local commandant of Berdychiv Fokstein, which was published in the newspaper *Nova Doba* No. 7 on January 9, 1942. It stated that 10 hostages were arrested for damage of a military telephone cable.

According to the order of the District Commissioner, there were restrictions for the native population to be outside.

1. Restaurants should be closed at 8 p.m.
2. Cinema and theatre performances should be finished at 8:30 p.m.
3. Being outside between 9 p.m and 3 a.m. was banned [7].

With the failures of the German army, gradually the mood of the newspaper became more and more aggressive, and since the beginning of 1943 in most articles of the newspaper the retreat of German troops is described as a part of the strategic plan of German command. The issue from February 10, 1943 states, "To maintain a successful war the German army fights at the fronts demonstrating heroic and victorious battles. Some unconscious citizens, without realizing it, wrongfully concluded that the Germans are retreating. Such people forget the simple truth confirmed by history, where the German soldier stepped his foot there would never be an enemy"[6].

The economic policy of Nazi occupants towards the territory of Berdychiv corresponded to the objectives that were formulated by A.Rozenberg to Hitler on

March 16, 1942. “German policy objectives particularly in Ukraine are determined by the Fuhrer: identification and military use of natural resources in certain areas of German settlements, no artificial intellectualization of native population, preserving only its labour force, finally no interest in other domestic events” [3 p.40].

The first step to implement the above mentioned instructions was the use of a forced labour of civil population. On July 8, 1942 Gebietskommisar Helner ordered the compulsory attendance of the citizens to the Labour Exchange.

“All those citizens of Berdychiv and its suburbs who are not employed but are capable of working must take part in mandatory work.

That’s why citizens from the age of 15 to 50 must come to the department of local household for work at 7 a.m. every day from July 13. They must have spades.

Those who oppose working, will be fined up to 100 Krb. or taken to the Work Camp” [14].

According to the order of the Reich commissar of Ukraine the number of Ukrainian citizens who could be employed or hold positions in commerce was limited. It proves that there will be no place in administration for Ukrainians in future.

Occupants forced citizens to hand in warm items for the German army. For example, Gebietskommisar’s assistant Schmidt ordered that those who steal, commit sabotage or damage things which are assigned for German army would be punished to death.

To simplify the process of removing goods for the Germany, on December 30, 194, the Berdychiv town administration adopted the resolution *On inventory of household goods* [11].

Thus, all these facts prove the goal of German economic policy in occupied Ukraine: to plunder and to sack [4; c. 30].

Among the endless tragedies that besot Ukraine in World War II, Nazi occupation was a phenomenon that quickly became a terror to the entire population and forced deportation of young people of working age to Germany. It’s significant that on the eve of the attack on the Soviet Union, Nazi leadership did not plan to use labour forces from the occupied territories in the German industry. On the contrary, they planned mass extermination of the population.

But since 1941, after the military situation had changed, the decision to use workers from the Soviet Union was approved by the Nazi leaders.

Hermann Goering wrote: “Qualified German workers should be engaged in manufacturing weapons; to row shovel and hollow stones is not their problem, it is the Russians” [5, c. 30]

Initially, the authorities conducted recruitment campaigns, promising all sorts of benefits for those who go to work in Germany. The population agreed under the burden of unemployment and hunger. But the reality of travelling was far from what had been promised. This is confirmed by a letter from Berdychiv citizen Lydia Polishchuk to her aunt, ".. Now I work in the camps. My feet are frozen and swollen.

We are given 300g of bread once a day, cabbage and turnips twice a day to eat.. "[1, p. 143].

These letters resulted in that the flow of those who wished to go to Germany exhausting quickly, and then Germans proceeded to forcible recruitment.

On May 12, 1943 the newspaper *Nova Doba* published a proclamation of compulsory labour of Ukrainian Youth born from 1923-1925. There is an interesting note in this appeal: "Work not for payment, work not for earning". [12] Work was an obligation, the failure of which meant an appropriate sanction of power.

Later numerous raids were arranged. General commissar's appeal to commissars of Zvyagel, Berdychiv and Zhytomyr mentioned: "… in Berdychiv forced supplying of labour resources from the cinema visitors is still continuing" [1, c. 132].

In total during the period of occupation more than 11 thousand people were cast away to Germany from Berdychiv.

Everything mentioned above is the essence of Nazi economic policy which meant economic exploitation of occupied nations and territories.

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SOCIAL WORK - CHALLENGES OF PROFESSION

The importance of social welfare can hardly be denied nowadays. Social workers are a hot commodity in the 21st century and should continue to be in-demand members of society. Due to economic, social and political problems of Ukraine people are desperately in need of those who are able to support them through difficult times and ensure that vulnerable people, including children and adults are safeguarded from harm. The role of social workers is to provide support and help in order to improve outcomes in people's lives. They maintain professional relationships with people, acting as guides and advocates.

The main tasks of professional social workers include case management (linking clients with agencies and programs that will meet their psychosocial needs), medical social work, counseling (including psychotherapy), human services management, social welfare policy analysis, community organizing, advocacy, teaching (in schools of social work), and social science research. Some social workers work as psychotherapists, counselors, or mental health practitioners, often working in collaboration with psychiatrists, psychologists, or other medical professionals [2].

What are the key factors which make you a successful professional of this sphere? Firstly, previous work experience in an area relating to social work is extremely important for entry into the profession. This may be through paid positions or voluntary work and can include roles in community care centers, working with children or with vulnerable adults. Any roles that show you can demonstrate empathy, along with a genuine desire to improve the quality of the lives of others, are helpful. Secondly, the efficiency of your future career choice also depends on the level of training, knowledge and what is more important – your personal characteristics, qualities, ideological position of life. Social workers must create for themselves a system of values, which is consistent with the essence and content of social work, social norms, and traditions.

According to A. Markova [1, c.188], the model of specialist consists of two main components: a model of personality and a model of professional. The first provides the basic requirements of professional identity, emphasis professionally important qualities and features. The second one regards to analysis and description of typical problems and methods of their solution during the professional activity. As very often social workers need to use their professional judgment to make tough decisions that might not always be well received by those they are trying to help.

Being a senior student of Social work Department I started to wonder how I can make myself stand out from the crowd of qualified applicants to get a desirable job in this sphere. When applying for a position, it is essential to market your specialized social work package, so an employer can easily assess your candidacy

based on how qualified you are and the reasons you better fit than the other competitors. Having read some articles [3] I got to know that the strength of your professional promotional tools may be the most vital piece of your social work career marketing. These tools include resumes, cover letters, your elevator speech, and interviewing skills—anything you can use to get a job interview and ultimately get a job offer. Luckily, nowadays there are lots of useful websites full of tips and advice which can help an applicant to develop their skills in a necessary way (e.g. : http://www.socialworker.com/feature-articles/career-jobs/10-essential-tips-for-your-amazing-social-work-resume/).

No matter how great your social work experience and how strong your resume is, if you cannot effectively communicate these skills to employers, you will not get the job. Job seekers should clearly realize what will be expected of them and show the potential employer that they have the knowledge and motivation to be a successful employee. Besides all the mentioned above aspects, social workers are expected to have superior organizational and information management skills. They may be responsible for managing multiple clients or projects and often must maintain detailed records. Social workers should also possess discretion and a good understanding of ethical standards. The ability to find resources and think outside the box when doing so are also key attributes. They need to have a thorough knowledge and understanding of the policies involved in coordinating services for clients [4].

The number of Ukrainians requiring social assistance is rising. A lot of people are affected by the war in eastern Ukraine. It also requires the development of appropriate infrastructure and the provision of social assistance. Social workers are faced with a different set of strategies and interventions.

Thus, all of us must do their best not only to achieve our personal goals but also meet the challenges of the modern society and help its most vulnerable elements.

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