

## **SOFTWARE ENGINEER: DUTIES AND RESPONSIBILITIES**

Last few decades witnessed rapid increase in technological sphere. This trend has created numerous job opportunities and many young adults nowadays opt for a career in IT. One of the most appealing options is a career in software engineering. Software engineers are responsible for designing and developing effective software solutions to meet their clients' requirements. Most software engineers specialize in a particular area and could be responsible for working on anything from web applications and content management systems to databases and operating systems. Software engineers get involved throughout the entire project life cycle. Graduates can find their first employment in technical and support roles that relate to their area of study and skills, and can include supporting the design, development and management of hardware, software, multimedia and systems integration services.

The term 'software engineering' was coined by Margaret Hamilton in 1963, while working on developing the software for the Apollo spacecraft. At that time, software development faced a crisis in trying to keep up with the progress in hardware development. This period led to the rise of software engineering by introducing new programs and languages. In 1968 and 1969, the NATO Software Engineering Conference took place, giving the software engineering industry a much-needed boost. By the 1980s, software engineering secured its place alongside the computer science and traditional engineering professions [0].

Software engineers have already changed the world through improving connectivity, automating repetitive tasks and writing software that has fundamentally changed the music industry. You can find software engineers writing the software that controls the movement of assembly-line robots, creating artificial intelligence that controls characters in video games, developing software for a portable Global Positioning System (GPS) so that drivers don't get lost and writing software that allows people to communicate over great distances [0].

To become a software engineer it is vital to possess a set of various skills. Along with hard skills which make a good specialist it is necessary to emphasize the role of soft skills as well. Among them the following are extremely essential:

- **Communication:** Software engineers must be adept in communication, problem-solving, and teamwork. They may report progress to a supervisor, explain product features and capabilities to a client, or coordinate with team members who work on the same product.
- **Multitasking:** Software development can require engineers to split attention across different modules of the same project, or switch easily between projects when working on a deadline or meeting team needs.
- **Organization:** To handle multiple projects through various stages and keep track of relevant details, software engineers must demonstrate a certain level of organization. Busy supervisors oversee entire teams and must access information efficiently at a client's request.

- **Attention to Detail:** Concentration plays a critical role for software engineers. They must troubleshoot coding issues and bugs as they arise, and keep track of various complex details surrounding multiple ongoing projects.

In their daily work software engineers rely on numerous programming languages. The most popular languages which have a wide sphere of application are the following:

1. **Java:** This programming language produces software for multiple platforms without the need for recompilation. The code runs on nearly all operating systems including Mac OS or Windows. Java uses syntax from C and C++ programming. Browser-operated programs facilitate GUI and object interaction from users.
2. **JavaScript:** This scripting programming language allows users to perform complex tasks. Most web pages are written in JavaScript. This language allows users to update content, animate images, operate multimedia, and store variables. JavaScript represents one of the web's three major technologies.
3. **SQL:** Also known as Structured Query Language, SQL queries, updates, modifies, deletes, and inserts data. To achieve this, SQL uses a set number of commands. This computer language is standard for data manipulation and relational database management. Professionals use SQL to manage structured data where relationships between variables and entities exist.
4. **C++:** Regarded as an object-oriented, general purpose programming language, C++ uses both low and high-level language. Since virtually all computers contain C++, software engineers must understand this language. C++ encompasses most C programs without switching the source code line. C++ primarily manipulates text, numbers, and other computer-capable tasks.
5. **C#:** Initially developed for Microsoft, this highly expressive program language is simpler than other languages, yet it includes components of C++ and Java. Generic types and methods provide additional safety and increased performance. C# also allows professionals to define iteration behavior while supporting encapsulation, polymorphism, and inheritance.
6. **Python:** This high-level programming language contains dynamic semantics, structures, typing, and binding that connect existing components; however, the Python syntax is easy to learn with no compilation stage involved, reducing program maintenance and enhancing productivity. Python also supports module and package use, which allows engineers to use the language for varying projects.

Software engineers' daily responsibilities can vary depending on their position. They may work with clients or executives to develop projects and design programs to meet those expectations. They also assemble charts and diagrams, write code, and supervise a team of programmers. Software engineers also run tests and fix issues that may occur with the programs [0].

Software Engineers are in demand in many industries, including telecommunications, manufacturing, airlines, electronic entertainment, banking and finance, e-commerce, professional services, consultancies, retail, public sector, and specialized software industries. They are needed by many large companies and by smaller development companies. This may be with major computer companies, or smaller, more specialized firms within the sector, or within the IT departments of

companies whose core business is in another field. The industry is characterized by a large number of small businesses employing a fraction of the industry's workers, and a small number of much larger organizations employing a larger percentage of the ICT workforce. Sectors include:

- Networking and network security, services and support.
- Testing, database design and development.
- Systems analysis and development.
- Systems administration and management.
- Web and multimedia technologies.
- Programming, interactive & digital games.
- Digital media technologies.
- National Broadband Network and cloud computing.

Taking this into consideration, software engineering encompasses a wide range of skills which are to be acquired by a future specialist. Despite this, all skills have to be regularly updated in order to be able to respond to changes of a highly competitive IT environment.

### **REFERENCES**

1. John Sonmez, (2020), Soft Skills: The Software Developer's Life Man. Simple Programmer, LLC. 504 p.
2. <https://science.unimelb.edu.au/students/careers/careers-in-science/information-technology/software-engineer>
3. <https://www.computerscience.org/careers/software-engineer/>