Software Development

What is a Software Developer?

A software developer is involved in the entire process of creating and designing new systems and software — from initial planning, to establishing parameters, designing, writing, coding, encrypting, and testing.

Software developers often use several programming languages (such as HTML, JavaScript, Python etc), and the profession requires knowledge in computer sciences and mathematics. As new technologies and advancements are happening every day, this field is constantly evolving and software developers must always be learning and keep their skills up-to-date [1].

Statistics About the Industry

With technology ever present in people's lives, the global demand for professionals in software development is growing rapidly in Canada, and across the world:

According to Evans Data Corporation, there were 23 million software developers worldwide in 2018, this number is expected to grow by 15% to reach 26.4 million by the end of 2019 [4].

In Canada, the average salary for a software developer can range anywhere between $40,000 - $100,000, depending on location and level of experience [5].

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Skills that Help Professionals

As a subject matter expert who works as part of a broader team, other valuable skills that help a software developer are [2]:

Problem-Solving: Since software is designed to fix technical problems, a software developer must have the ability to problem-solve. A software developer must be able to think creatively when faced with a problem so that they can solve it with minimal resources, and a limited amount of time.

Educating Yourself: Software developers must always be learning due to the rapid advancements in technology. They need to have the ability to understand what's important, then be able to find the resources to educate themselves about that particular issue so that they can resolve it.

Working with Others: Being a software developer requires you to work with others while doing your job; whether it be other developers, clients, or other employees. They must be able to communicate well with others, be flexible, be patient, and know how to work on a team, in order to be successful.

A few technical and functional skills, needed for a software developer are [3]:

Data Structures and Algorithms: Data structures and algorithms are at the centre of all programming, as algorithms are a useful tool to help solve various computer/programming issues. Once you begin working as a software developer, you realize the importance of organizing the information using proper data structures and using algorithms to solve a specific problem in less time, with less space, and without using as many resources.

Programming Languages: Programming languages are comprised of a set of instructions that produce various kinds of output. In order to be a successful programmer, you must have an understanding of different programming languages, such as JavaScript, HTML/CSS, Python, etc. By learning one of these languages in-depth, software developers are able to write their code more effectively and efficiently.

Basic Database Knowledge: At the very least, software developers should understand the basics of databases. This includes; how databases work, how to perform basic queries to get data, how to insert/update/delete data, and how to join datasets together.

Source Control: Source control is an integral part of any software development project, and all software developers are expected to know how to use source control to check in code, check out the code, and hopefully merge changes from multiple sources. Software developers should be comfortable with version control concepts and tools, such as Git, Mercurial and SVN.

There are several post-secondary courses in Nova Scotia for students to enroll in to learn how to become a software developer:

Saint Mary's University (SMU) Computer Science [7]:

Computer science involves the systematic study of the algorithms that underlie the acquisition, representation, processing, storage, communication of—and access to—information of all kinds. It also involves the study of computing platforms and programming languages, such as C++ and Java. In this program, students will explore creative ways to solve problems, as they discover how computers, and computer systems, can be applied to everything from medicine, to security, to entertainment. Students will also develop other marketable skills, such as project management, and software design and development.

Dalhousie University Applied Computer Science [8]:

In this program, students will develop programming skills, explore the foundations of computer science, and embark on an exploration of the social and philosophical impacts of computing. Students will learn to combine a deep understanding of technology with problem-solving, communication, and management skills. Students will know how to analyze problems, manage and lead teams to tackle those problems, and communicate solutions and opportunities back to the wider organization.

Dalhousie University Computer Science [9]:

Students will learn the theory, design, and application of computer science by exploring a wide range of areas including software development, algorithms, networking, and graphics. In this program, students will learn how to create new, and innovative, technologies that will shape how we use computers and how we interact with each other in the future. Students take courses that will expand their knowledge about operating systems, cybersecurity, machine learning and AI, and much more.

Saint Francis Xavier University Computer Science [10]:

In this program, students will learn all aspects of the scientific foundations of information and computation together with practical techniques for the implementation of these foundations. The material in this program is applicable to almost every facet of life, and students will learn through an intensive, hands-on approach. There are many sub areas of this program, including artificial intelligence, databases, game development, cyber security, graphics, high performance computing, big data, networking, programming languages, robotics, and much more. There are new areas, such as health informatics and the internet of things, being created and included in the program to keep up as the discipline evolves. The program takes students four years to complete.

Acadia University Computer Science [11]:

Students will be brought up to industry standards by the program providing them a mix of computational theory, systems and architecture knowledge, problem solving, systems analysis and application development skills and experience. As well these courses can help student improve upon their soft skills as the on-going development of interpersonal, communication, team work, project management and entrepreneurial skills are important elements of many courses. This program also takes four years to complete.

Nova Scotia Community College (NSCC) IT Web Programming [12]:

This program teaches students computer programming by exploring, and building, web applications. In this two-year program, students will learn how to be a skilled computer programmer, how to develop complex data-driven web applications using a wide variety of different technologies and languages, how to work within an evolving ecosystem of web technologies, how to deploy and administer content management systems, and the basics of server administration and visual design.

Udemy Computer Science [13]:

An online resource that anybody can access and use. There are three computer science programs (101: Master the Theory behind Programming, 101: Computers & Programming for Beginners, and Introduction to Computer Sciences) available to register for. Each of these programs costs under $15, and includes a series of lecture slides and notes that students can read at their own pace to learn the course material.

WHAT DO THE PROFESSIONALS THINK?

ALEX NUNES

SOFTWARE DEVELOPER, MOTRYX

Alex Nunes has been working in the industry for the last five years after graduating from the Applied Computer Science program at Dalhousie University. Alex notes that the software development industry is on the rise as more and more companies in Halifax, and across Nova Scotia, are seeing the value software developers bring to their organization.

“I definitely don’t see employment opportunities in the industry going on a downward spiral here anytime soon. More start-up companies are forming across Nova Scotia, which needs software developers to help start their business, and established companies have started to hire even more web developers to join their organization.”

Though Alex enjoyed his time learning about computer science at Dalhousie, he says university is not the only way students can develop their skills.

“If you are a student, or young person, that is interested in software development, university is definitely one path, but it’s not the only one. I’ve found plenty of online resources that are good at explaining computer sciences and coding, and help you develop your skills. These are useful because employers aren’t looking for a degree, they’re looking at your skill-level, so if you’re able to teach yourself and show them you can do the work, you’ll have just as good of a chance as the university graduate.”

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WHAT DO THE PROFESSIONALS THINK?

BRET TOWNSEND

VP - BUSINESS DEVELOPMENT NORTH AMERICA, MEDUSA MEDICAL TECHNOLOGIES

Brent Townsend is the current Vice President of Business Development North America at Medusa Medical Technologies, but has been working in the software development industry since 1997. Brent agrees with Alex about the current state of the software development industry in Halifax, and adds that the tech sector as a whole in the city is something to get excited about.

“With my job, I am fortunate to travel throughout Canada and the U.S., and compared to what I’ve seen, I believe Halifax is a perfect location for companies looking to grow and for start-ups to be supported. It’s an exciting time, and I think it’s only going to continue to get better.”

When asked for a piece of advice to give prospective students looking to get into the industry, Brent simply encourages students to just go for it, and follow their interest.

“Be bold, take risks, and believe in your ideas. Great companies and software products are built right here in Nova Scotia and they start with bold ideas, drive and commitment.”

The more you know

According to Canada’s Information and Communications Technology Council’s Digital Talent Outlook, software developers will be the most in-demand position in tech from now until 2023 [6].

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