Web Development

What is a Web Developer?

A web developer is a type of programmer that creates websites. Web developers have a difficult job because they act as an interpreter between clients and computer capabilities, taking a conceptual design, and translating it into a language that computers understand, such as Python or HTML [1]. The primary responsibility of a web developer is to build consistent and efficient, web applications and services to the specifications of the client.

Important Skills

- Ability to empathize with co-workers, clients and users
- Strong work ethic and willingness to be flexible
- Working with others and being a team player
- Have a willingness to grow from criticism

Statistics About the Industry

Today, having an online presence is critical for all organizations, and the demand for web developers is growing across all industries, not just within the tech sector:

- In Atlantic Canada, the average salary for a web developer ranges between $41,000 - $81,000, depending on location, employer, and experience level [6].
- This role has previously been dominated by men, with a reported 88 per cent of all web developers in the country identifying as men in 2017. But, this has slowly begun to change over the past two years, as the ratio of men-to-women web developers has decreased from 17-1 in 2017, to 10-1 currently [7].

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Roles and Skills needed

There are three common types of web developer roles, each with a different focus [2]:

Front-End Developer

A front-end developer designs and writes the code needed to implement the website or service. The web developer is responsible for making sure that all the content that is needed for the website is clear, visible, and found in the right place. They are also responsible for the design and look of the website, including text colors, background colors, headers, links, and buttons.

Back-End Developer

While front-end developers are responsible for client-side programming, back-end developers focus on the server-side. They must create the code and programs that power the website's server, databases, and any applications that it contains. The most important thing as a back-end developer is the ability to be able to create a clean, and efficient, code that does what you want it to in the quickest way possible.

Full-Stack Developer

Full-stack developers understand both front and back-end strategies, which means that they are perfectly positioned to oversee the entire process. Learning full-stack development techniques has a huge range of benefits, and positions like this are likely to be paid more than standard web development positions, making them more attractive to developers.

Analytical Skills

Behaviours are constantly changing, so your designs, coding, and development skills will have to change too. There are a number of ways to understand consumers, but one great method is to hone-in on their online behaviors. There are tools available such as Google Analytics, MOZ, and SEMRush that can help. With statistics, you'll better understand your specific target audiences, as they show you which keywords users search for, and how long they stay on your websites.

Photoshop

As a web developer, Photoshop will give you the ability to do your work faster, and better. You will use Photoshop primarily for creating mock-up websites for your clients. You can use Photoshop to edit, design, and stylize websites before presenting them or going live with them. You will also learn how to translate and code designs through working in Photoshop as well.

HTML/CSS

Web developers need to understand the basics of coding, including HyperText Markup Language (HTML). HTML forms practically every web page on the Internet, and how a website functions depends on the way a developer writes the code. Cascading Style Sheets (CSS) interprets documents written in a markup language, and can describe how a HTML document will look visually as a website. It lays the foundation for font, colors, and overall layout.

JavaScript

JavaScript is a higher-level programming language that makes websites more interactive and functional, and allows you to create better experiences for web users. With JavaScript, you can write special features directly onto your sites, including search bars, social media share buttons, and videos. JavaScript compliments HTML.

With the industry growing quickly, web development is a continuous need. There are several post-secondary courses in Nova Scotia for students to enroll in to learn how to become a web developer:

Nova Scotia Community College (NSCC) IT Web Programming [8]:

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.

Dalhousie University Computer Science (9):

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

Saint Mary's University (SMU) Computer Science [10]:

Computer science involves the systematic study of the algorithms that underlies the acquisition, representation, processing, storage, communication of information. 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 gain project management, and software design and development skills.

Nova Scotia College of Art and Design (NSCAD) Interdisciplinary Design [11]:

Interdisciplinary Design is a unique program that takes a distinctly collaborative, interdisciplinary, and process-oriented approach. It covers a range of design disciplines from communication, to graphic interaction and product design. Focusing on the process of design thinking and the various visual and technical skills associated with the design disciplines, students learn to solve problems, identify opportunities, and communicate solutions across a broad range of media and contexts.

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GETTING STARTED

Saint Francis Xavier University Computer Science [12]:

In this program, students will learn 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. This program takes students four years to complete.

Acadia University Computer Science [13]:

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. Throughout these courses, students will also improve upon their soft skills, such as interpersonal communication, team work, project management and entrepreneurial skills. This program takes four years to complete.

Udemy Computer Science [14]:

An online resource that anybody with reliable internet can access and make use of. 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 there is 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?

CHRIS JONES

WEB DEVELOPER,
\ABLE SENSE

We spoke to current web developer Chris Jones, working in the tech sector in Halifax, and discussed the current state of the profession:

Chris Jones said that in today's industry, web developer's roles are much more defined and specific than they were in the past for many organizations, tech or not.

"When I first started working at a web developer in the 1990's, a web developer's role was often viewed as the 'Web Master', as they would be responsible for doing almost all the computer-based work for the office. In 2019 though, companies hire developers who can complete a specific role of programming, such as front or back-end developers, database analysts, performance engineers, and many other roles."

Jones also spoke about how the profession is currently doing in Nova Scotia, and said that it is definitely on the rise.

"I think there is quite a bit of good stuff going on in Nova Scotia when it comes to the web developer industry; it's very much on the up, there's lots of smart people here, lots of opportunities, and lots of post secondary institutions to help them."

When asked for one piece of advice that he would give students, or those interested in becoming a web developer, Chris encouraged asking yourself:

"Do you enjoy being challenged? Are you a problem solver, and enjoy thinking outside the box? Do you enjoy constantly learning, and advancing your skills? Do you enjoy creating and building new things? If you answer 'yes' to any of those questions, then I believe you can have a career being a web developer."

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WHAT DO THE PROFESSIONALS THINK?

We also spoke to Derek Morash, another web developer at Able Sense. We asked him what his piece of advice would be, and it was simple; go online and start trying to create things on your own.

“I would suggest for anyone that is interested in this type of work just to simply go on Youtube and look up ‘How to Build a Website’, and then try to do it themselves. If they try it, they’ll quickly know if they like it or not, and they’ll also gain first-hand exposure to the type of work they would be doing working as a web developer. I think it’s a fun, and effective, way to get people introduced to the industry.”

DEREK MORASH

WEB DEVELOPER,
ABLE SENSE

The more you know

According to Atlantic Canada Data Information and Communications Technology Council’s 2019 report, a web developer is one of the most in-demand positions throughout the tech industry in Canada (5) .

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UX DESIGN

What is a UX Design and a UX Designer?

User Experience (UX) design is the process used to ensure products and services provide a meaningful, and relevant experience to their users. UX design has been a part of our society for decades, dating back to the Greeks and Romans creating military weapons to fit the specific needs of their soldiers, but the term “User Experience” wasn’t established until the early 1990’s [1].

UX design covers a vast array of other areas of design. A UX Designer is concerned with the entire process of acquiring and integrating, a product or service, including aspects of branding, design, usability, and function. When designing a product, a UX Designer needs to concentrate on the user’s experience when using it.

THE WHY ,WHAT AND HOW

When working on a product, a UX Designer should consider three aspects of the product - the Why, the What, and the How [2]:

- The Why involves the user’s motivation for adopting a product. A UX Designer needs to be able to relate the product to the user so that they can see themselves using or valuing it.
- The What addresses the functionality of the product/service, and what people can do with it based on how you designed it.
- **T**he How relates to the design of the product, and having it be accessible and aesthetically pleasing to the users as possible.

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Skills that Help Professionals

A combination of personal attributes and communication skills can help a UX Designer [3]:

Communication: A UX Designer spends a lot of time presenting to clients and stakeholders, interviewing users, drawing design solutions, and collaborating with the members of their team. For this reason, the number one soft skill to have as a UX Designer is communication — whether written, verbal, or visual. A UX Designer needs to be able to articulate their ideas clearly, while also being an active listener.

Empathy: As decisions are being made about the direction of a product or service, UX Designers are required to be the voice of that product/service's users. A UX Designer must advocate for them, and be able to view the product or service through their eyes. What are their pain points? What are their goals? What do they want? Empathizing with your users will allow a UX Designer, and anyone else they're working with, to make better design decisions that will result is a more user-friendly product/service.

Organization: A UX Designer works with many documents and design deliverables in their role. This can include anything from design briefs, research findings, and interview results to wireframes, prototypes, and design specifications. It's therefore essential that a UX Designer be highly organized.

When it comes to completing the day-to-day work, the technical and functional skills designers need to know are:

User Research: Research can be the determining factor between a great experience and a terrible experience for users of a product or service. User research, and the analysis of this research, can play a crucial role in discovering user needs and wants for a product/service. It also plays a pivotal part in the UX design process. Tasks for user research include, but are not limited to, user testing, interviews, surveys, questionnaires, and focus groups.

Information Architecture: Information architecture refers to the organization of information in an effective, accessible, and meaningful way. With the sheer amount of information now available online, the role of information architecture has become more significant. Good information architecture ensures that whenever a user enters your site or app, they know exactly where to go for the information they need and can easily navigate to it.

Wireframing & Prototyping : Wireframes and prototypes are a crucial component of any design process. They allow a UX Designer to quickly communicate and test their ideas with teammates, stakeholders, and potential users before time and money are poured into the product's visual design and development.

Though UX Designers are relatively new to the tech sector, there are a few formal user experience courses at post secondary institutions within Nova Scotia, as well as online resources for people to use to receive an education about UX:

Nova Scotia Community College (NSCC) Graphic Design [7]:

In this program, students will learn the essential skills required to be a successful Graphic Designer by covering subjects such as design process and management, design history, typography, digital imaging, editorial design, branding and professional graphic design practice. You also learn about entrepreneurship while working in a studio environment.

Nova Scotia College of Art and Design (NSCAD) Expanded Media [8]:

For students in first year, NSCAD requires that all degree students complete two semesters of Foundation Studies, which are designed to introduce the practices, principles, approaches, and issues of art, craft, and design. After completion, students are able to enroll in the Expanded Media program. This program offers students the opportunity to explore interdisciplinary practices, collaboration and research, and conceptual and social issues in a range of media arts, including: film, video, installation, performance, audio art, digital media, electronics, animation and photography.

Nova Scotia College of Art and Design (NSCAD) Interdisciplinary Design [9]:

Interdisciplinary Design is a unique program that takes a distinctly collaborative, interdisciplinary, and process-oriented approach. It covers a range of design disciplines from communication, to graphic, interaction and product design. Focusing on the process of design thinking and the various visual and technical skills associated with the design disciplines, students learn to solve problems, identify opportunities, and communicate solutions across a broad range of media and contexts.

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GETTING STARTED

CareerFoundry - UX Design [10]:

An online resource that will allow students to learn all of the skills, tools, and processes necessary to become a UX Designer. Students work with an experienced industry mentor as well as a tutor to gain day-to-day feedback and build out a portfolio of projects completed in the course. Participants will also receive tailored coaching from the Career Services team to prepare for interviews, with a guarantee to find a job as a UX designer within 180 days of graduating from the course or your money back.

Interaction Design Foundation UX Courses [11]:

An online resource that is trying to raise global design education, without raising the price. IDF is pay-as-you-go, with memberships only costing $14 per month. Members will be granted access to an extensive library of design-related textbooks and instructor-led design courses, which students can enroll in as many as they want. Members who enroll in the UX Design course will learn an introduction to all aspects of UX design, including key design and psychological principles, what cognitive processes underlie human-computer interaction and how to design with this knowledge in mind, how visual perception affects the viewing experience, examples of good and bad design to help you avoid common mistakes, and the importance of usability over aesthetics.

Udemy – UX Design [12]:

An online resource that anybody can access and use. There are countless courses that people can sign up for, ranging anywhere from $14.99 - $100+ depending on the course. Each of these courses is 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?

JULIANA KROSCEN

UI/UX DESIGNER,
HOMEEXCEPT

Juliana Kroscen, a UX/UI Designer at HomeEXCEPT, says that the current state of the profession in the province is growing, but is not established in every major company, tech or not, just yet.

“A lot of companies, and people, weren’t even aware of what UX was, and what UX Designers did for an organization, even as recently as a year ago. Since then, word has spread throughout the tech community, educating companies about UX and bringing awareness to the profession. Now, most companies are aware of it and, even if they’re not entirely sure what it is or what it does, everyone is trying to hire a UX Designer now.”

The more you know

According to a 2018 report, although UX and UX design is on the rise throughout the country, the majority of positions available are in Ontario and Quebec [4]

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WHAT DO THE PROFESSIONALS THINK?

JAMIE GERRAND

DIRECTOR OF STRATEGY AND DESIGN,
20/20 EXPERIENCE DESIGN

Jamie Gerrard, Director of Strategy and Design at 20/20 Experience Design, says that many tech companies in the province are just now realizing the value that a UX Designer can bring to an organization.

“An organization that is designed-focused, and puts their customers ahead of everything else, is an organization of the future. If an organization can get practice being design-focused, and designs their products or services with their customers needs and wants in mind, that is timeless, and they will see the benefits of that.”

The more you know

69.5% of all UX Designers working in Canada are between the ages of 26-45 [5].

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WHAT DO THE PROFESSIONALS THINK?

JOSH UDALL

CREATIVE DESIGN, WATZAN

Josh Udall, creative director at Watzan, agrees that there is still a lot of confusion surrounding the field despite its growth in the province.

“On average, when most people think about UX, and UX Designers, they think about designing apps and websites, and that’s it, when there is really a lot more to it. UX is about user experience with everything about a company, not just their technology. A UX Designer helps design that experience so that the user can have as great as an experience as possible with whatever they’re doing.”

When asked for advice to give students, or young professionals that are thinking about entering the industry, all three of their answers were the same — never stop learning. Use the internet to find out as much as you can by watching videos and reading articles about UX, attend workshops and classes in the area, and find companies that have a UX Designers and go talk to them about their job.

"Never stop learning, use the internet to find out as much as you can by watching videos and reading articles about UX, attend workshops and classes in the area, and find companies that have a UX Designers and go talk to them about their job."

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Cybersecurity

What is Cybersecurity?

Cybersecurity is the technology, processes, and practices that protect networks, devices, programs, and data from cyberattacks, damage, or unauthorized access [1]. Cyberattacks are an evolving danger to organizations, employees, and consumers, as they can access or destroy information, or even extort money. They have the ability to destroy businesses and damage people's financial, and personal, lives [2], and a career in cybersecurity means working to make sure that doesn't happen.

As our world becomes more tech-focused, organizations and people store unprecedented amounts of data on their devices (photographs, passwords, banking information and more), so cybersecurity is becoming increasingly important!

Cyberattacks are a constantly growing, and evolving. Cyber criminals find holes in coding and new ways to exploit networks, so we all need to be prepared with excellent cybersecurity.

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Cybersecurity Threats

There are many types of cyberthreats that can attack devices and networks, but they generally fall into three categories [3]:

Attacks on Confidentiality - these include stealing personal identifying information, and bank account or credit card information. Many attackers will take individuals information and sell it on the dark web for others to purchase and use.

Attacks on Integrity - these attacks consist of personal or enterprise sabotage, and are often called leaks. A cybercriminal will access and release, sensitive information for the purpose of exposing the data, and influencing the public to lose trust in that organization.

Attacks on Availability - the aim of this type of cyberattack is to block users from accessing their own data until they pay a fee, or ransom. Typically, a cybercriminal will infiltrate a network and block access to important data, demanding a ransom to release control. Companies sometimes pay the ransom and fix the cyber vulnerability afterward so that they can avoid halting business activities.

Careers in Cybersecurity

Due to the constant evolution of cyberattacks and creativity of cybercriminals, there is always an industry need for trained professionals who understand how best to prevent cyberattacks. Some of the most common professions in this industry include [4]:

Security Analyst: This role analyzes and assess' vulnerabilities in the infrastructure (software, hardware, networks), investigates available tools, or countermeasures to remedy any detected vulnerabilities, and recommends solutions. A security analyst also analyzes and assesses damage to the data/infrastructure as a result of security incidents. They might also assist in the creation, implementation, and management of security solutions.

Security Engineer: Performs security monitoring, security and data/logs analysis, and forensic analysis, to detect security incidents and response to them. A security engineer also investigates, and utilizes, new technologies and processes to enhance security capabilities and implement improvements.

Security Architect: Designs a security system or major components of a security system, and may head a security design team building a new security system.

Security Software Developer: Develops security software, which includes tools for monitoring, traffic analysis, intrusion detection, virus/spyware/malware detection, anti-virus software, etc. Also implements security into applications software.

Important Skills

As a cybersecurity professional who works as part of a broader team, other valuable skills that help are [5]:

- **Ability to work in a team environment, and collaborate with others**
- **Communications skills**
- **Organizational and problem-solving skills**
- **Integrity and discretion**

Skills that Help Professionals

A few technical and functional skills, needed to work in cybersecurity are [6]:

Understanding of Security Principles: An understanding of basic security principles, such as privacy, confidentiality, authentication, access control, and others.

Malicious Codes: A working knowledge of malicious codes, which are any codes in a system that are intended to caused harm. They need to know how they are propagated, and the risks associated with each.

Risk Analysis: To be able to assess a client's particular security needs, which requires knowledge of risk analysis principles.

Intruder Techniques: In analyzing attacks, personnel should be able to recognize known intruder techniques, their characteristics and effects, and identify new intruder techniques by means of elimination of known ones.

Statistics About the Industry

According to Canada's Information and Communications Technology Council's Digital Talent Outlook, a cybersecurity analyst will be one of the most in-demand jobs in the tech sector of Canada between now and 2023 [7].

The average salary for any position in the cybersecurity field (analysts, engineer, etc.) varies greatly, as it is between $44,000-$105,000 in Canada, depending on what job you're working, experience level, location, employer, and education towards the specific field [8].

In 2018, Canadian police services reported that there were almost 33,000 cyber-related crimes, which was a 12 per cent increase from the previous year [9].

Where to Get Started?

With cybersecurity becoming more in demand across almost all industries, now is a great time to enter the industry. There are several post-secondary courses in Nova Scotia for students to enroll in, that will give them the skills and knowledge to be working in cybersecurity:

Nova Scotia Community College (NSCC) Cyber Security [10]: In this program, students will learn how to provide the information, and tools, necessary to identify and secure potential vulnerabilities. Students explore a variety of information and system security areas and methods, including ethical hacking techniques, risk analysis, cryptography, vulnerability testing, auditing, and security management.

Nova Scotia Community College (NSCC) IT Systems Management and Security [11]: In this program, students design the implementation and management of the core technologies that support information communication technology (ICT). These technologies include UNIX/Linux and Windows network operating systems, local area network (LAN) and wide area network (WAN), security implementations to protect data and users, and systems analysis and design (SAD).

Saint Mary's University (SMU) Computer Science [12]: 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 Computer Science [13]: Students will gain a deep understanding of 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 gain the foundational knowledge 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.

WHAT DO THE PROFESSIONALS THINK?

PHILLIP COUSINS

DIRECTOR - RISK AND SECURITY CONSULTANCY, RBC

Philip Cousins, the Director of Risk & Security Consultancy at RBC, has been working in cybersecurity for 20 years, and said demand for the profession has dramatically increased since he first entered the industry.

“The environment for cybercrime has grown massively over the years, as cyber attackers have become very organized and established. They can attack you in a variety of different ways – from defrauding accounts, spam hacks, ransomware, to many other methods of hacking. Due to this, most organizations have put an increased importance on hiring cybersecurity professionals to protect their information.”

Philip believes now is a good time for people to get into the profession due to the high demand, as well as that the pay rates are good compared to other jobs in tech. Also, there is less risk of this work being automated by machines in the future due to the complex, and specific, nature of the work.

He said the best advice he could give someone who is thinking about getting into cybersecurity is to do research about the profession.

“If you’re curious about cybersecurity, follow your interest learn as much as you can about it. Research some of the major data breaches that have happened, and read about how it happened, how they breached the system, and how they could have better defended it. Just keep following your curiosity.”

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WHAT DO THE PROFESSIONALS THINK?

ROHID SHARMA

SALES DIRECTOR, CYBERCLAN

Rohid Sharma a Sales Director at CyberClan, and has been working in the industry for three years. He said cyber attacks have increased exponentially in volume since he first started.

“Cyber attacks have been more sophisticated and targeted over the years, as the price for data online has gone up tremendously.”

Rohid also talked about how the industry is doing in Nova Scotia, and said that currently, it’s a great time to be a cybersecurity professional in the province.

“Though businesses as a whole are still a little behind on their understanding of their need for cybersecurity, I’ve found that mindset is slowly changing. As a result, more businesses and government offices are starting to get more cyber-conscious, and are hiring people to protect their data. So, it’s a great time to be a cybersecurity professional in Halifax.”

When asked what advice he would give to students, Rohid simply encouraged them to keep an open mind.

“As businesses’ dependence for technology continues to increase, the need for cybersecurity professionals will also increase. There are quite a few cybersecurity professionals that work remotely in Nova Scotia for companies out of province, and I believe remote work will only continue to grow in popularity over the coming years.”

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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.

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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.

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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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