SOFTWARE DEVELOPMENT



A FUTURE IN SOFTWARE DEVELOPMENT

WHAT IS SOFTWARE DEVELOPMENT?

Software is the essence of all technology, from smartphones to robots to power stations. Code, algorithms and data structures drive the systems that make modern living possible, and a detailed understanding of these concepts provides considerable career opportunities in a vast array of fields.

In software development, specialists design and enhance software and use the latest technologies including programming languages, operating systems, networks, distributed computing systems, servers, databases and modelling.

Workers in this domain need to be much more than technical experts. They must be able to think laterally and creatively to solve complex problems, and be able to communicate their solutions to non-technical colleagues and clients, while working in interdisciplinary teams with experts in diverse fields.

There is massive potential for development of technological solutions in most areas of human life. Already, technological solutions have started to transform domains including healthcare, communications, agriculture, industrial, entertainment fields and much more.

If you are interested in being part of the ongoing technical revolution, and having an influence on how modern life evolves, this could be the career path for you.

OUTLOOK AND TRENDS

Skill shortages continue

A 2022 CodinGame global survey of over 14,000 IT developers and recruiters found almost 50% of recruiters reported difficulty in finding qualified candidates, with up to 40% of employers hoping to hire multiple staff.

Shortages include DevOps, architects, data scientists and machine learning specialists. Many employers are encouraging existing staff to upskill or retrain, opening up more opportunities for graduates.

Mobile usage still growing

Mobile accounts for approximately half of web traffic worldwide. In the fourth quarter of 2021, mobile devices (excluding tablets) generated 54.4% of global website traffic.

A strong and accessible mobile presence is essential for any company that has a website, creating ongoing need for iOS and Android application developers. (Source: www.CIO.com)

Embedded systems

Embedded systems are small and vital tools created to perform functions within a larger mechanical or electrical system, often with real-time computing constraints. These control many devices, from portable devices such as digital watches and MP3 players, to large installations like traffic lights and factory controllers, as well as largely complex systems like hybrid vehicles.

The global embedded systems market is growing exponentially and requires new design software and strategies specific to those systems. Software designers and engineers work with these.

Big data

Companies are collecting more data than ever, but many struggle to organise the data in a meaningful way. According to *More Than Money Salary Guide* 2022, skills in data analytics are in higher demand than ever. Data analytics is one of the most sought after tech skills by industry, followed by experience with Python, Amazon Web Service, C, HTMLS and cyber security.

Cloud

The adoption, by both industry and households, of cloud storage such as Microsoft Azure, Amazon Web Services, and Google cloud using systems like iCloud, OneDrive, Google Drive, and Dropbox, has prompted the need for more data analysts and security professionals. The demand for skilled cloud computing and cloud security professionals will continue to increase as cloud storage continues going mainstream. (Source: www.CIO.com)

WORK SETTINGS

Professionals in this field usually work regular office hours, with some evening and weekend work when meeting deadlines.

They sometimes work on projects at client workplaces. Increasingly there is the option of working from home.

They work for a wide range of organisations, including private companies that provide computer, database and network services to clients, specialist ICT companies, software companies including entertainment and gaming specialists, startups, computer consultancies and telecommunication companies.

CAREER EXAMPLES

Programmer/software developer

Designs and maintains software systems, as well as writing software code for new applications and products.

Systems architect or designer

Analyses an organisation's software and design, oversees the development of new software systems, and ensures that these will assist the business processes of an organisation.

App developer

Creates and designs applications for smart phones and tablets, ranging from education and productivity applications to lifestyle and educational tools.

Game developer

Creates, writes, designs, programmes, animates, and tests games and applications for computers, consoles and mobile phones.

User interface (UI) engineer

Creates intuitive and consumer-focused mobile and web applications, tasked with building a seamless experience for the end user alongside a UI designer.

Business analyst

Researches the organisation's systems and procedures, deciding if and how computer applications and systems can be used to improve business efficiency and productivity.

SKILLS AND KNOWLEDGE

Technical skills

- Strong proficiency with principles and function of programming languages
- Skilled in designing and maintaining new web and mobile applications
- Excellent knowledge of user interface design

- Ability to analyse an organisation's overall business and establish how their software is used
- Proficient at identifying an organisation's technical requirements, and designing and building software to match
- Able to create architectural plans outlining the structure of new software applications
- Competent in creating, testing and reviewing new software and fixing problems
- Skilled in explaining to people throughout an organisation how the software will affect their work
- General skill requirements
- Skilled at oral and written communication and have good presentation skills
- Able to work well under pressure, and meet deadlines
- Works well within a team, and with little supervision
- Skilled at problem-solving and decision-making

PERSONAL QUALITIES

- Quick to learn and very practical
- Interested in IT and innovation
- Logical and good at planning
- Careful and meticulous
- Technically innovative

SALARY GUIDE

	Salary (per year)
Business analyst	Graduate \$56,000 (average) 5–7 years \$76,000 (average)
Software developer	Junior \$50,000-\$80,000 Senior \$120,000-\$180,000
Game developer	Graduate \$45,000-\$60,000 Senior \$100,000-upwards
UI/UX designer	Junior \$55,000 Senior \$140,000+
Solutions architect	\$130,000-\$170,000 (median salary)

Sources: Careers NZ, Glassdoor, Jobtet, NZ Games Development Association, Recruit IT Salary Survey 2022.

Salary range is indicative of the New Zealand job market at the time of publication (early 2022) and should only be used as a guideline.

THE AUT APPROACH

All students complete a research and development project in their final year for an industry or research centre client, bringing together the knowledge and skills developed throughout the degree. Students work in teams as consultants (with AUT staff supervising), on projects with big corporates such as Fisher & Paykel Healthcare Ltd, Deloitte and Fonterra, as well as smaller organisations like Basement Theatre, sports clubs, community, health, not-for-profit and environmental organisations.

AUT is home to several research institutes. **The High Performance Computing Research Laboratory** (**HPCRL**) is the hub for high performance computing projects in New Zealand. HPCRL works across a number of research and industry projects/initiatives aligned with computing technologies such as exascale supercomputing, big data processing and low power computing.

The Software Engineering Research Laboratory

(SERL) conducts research in key areas of computational methods, autonomous software, software engineering process and computer graphics, imaging and visualisation. Research has a mix of academic, practical and commercial importance that contributes to the overall knowledge economy of New Zealand.

The Knowledge Engineering and Discovery Research Institute (KEDRI) develops novel information processing methods, technologies and applications to enhance discoveries across science and engineering.



FURTHER STUDY OPTIONS

For those wanting more specialised study, postgraduate programmes include the Postgraduate Certificate and Postgraduate Diploma in Computer and Information Science, Master of Computer and Information Science, Master of Information Security and Digital Forensics, and Doctor of Philosophy in software development or computer science.

Recent research includes topics in agile software practices, description logic, software analytics, artificial intelligence, cloud computing, information security and computer mediated communication.

THEA MIGUEL

Technical Analyst – Graduate Developer, Adaptiv Integration Ltd

Bachelor in Computer and Information Sciences in Software Development

"As a technical analyst at Adaptiv, my day-to-day job consists of checking the systems our clients use, tending to queries and providing quick assistance to ensure processes run smoothly, including troubleshooting work.

Adaptiv specialises in system, data, and application integration for enterprise clients.

I really enjoy working here because of the opportunity to grow and learn new skills, including mentoring, leadership and client interaction, as well as technical skills that involve certifications across our leading platforms (Microsoft, Mulesoft, Biztalk, and Boomi).

I am currently working towards all my certifications so I can eventually do development work with our senior developers and consultants.

Adaptiv is a tight knit community of high performers with a great workplace culture, which is very important for graduates experiencing professional settings for the first time.

My biggest challenge is remaining patient with myself while learning. I know I don't always 'get' things straight away and there are days when I really have to focus on staying motivated on my goal to be a developer.

As a new graduate it is important to practice and build on the coding languages you touched on in university. A technical test is a common part of the hiring process and there is a difference between programming a game for a university assignment and querying out a database, or interpreting code that will ultimately affect a business!

Be honest about your skills when applying, so you don't end up overselling and then under-delivering."

EMPLOYER COMMENT

"We support a large number of clients over multiple environments and applications, that must be well supported by our technical analysts.

A graduate technical analyst needs the ability to learn and pick up new technologies quickly, work in a team environment and independently, show initiative, be good at prioritising and multitasking and be professional in all communications. Thea demonstrates all these requirements and shows willingness to keep learning and take feedback. She has great communication skills.

I advise graduates to continue to upskill. This may include training (most platforms provide training) and following online official accounts for platforms to keep up with the latest developments and releases etc.

Also, attend meet-ups, and online catch-ups in the area you want to specialise."

Adaptiv Support Manager Hardik Patel and Co-Founder/Principal Architect Nikolai Blackie

USEFUL WEBSITES

New Zealand Game Developers Association www.nzqda.com

Institute of IT Professionals www.iitp.org.nz

FURTHER INFORMATION

For the most up-to-date information on computer science and software development and the Bachelor of Computer and Information Sciences, please visit our website www.aut.ac.nz/computer-sci www.aut.ac.nz/software-development

EMPLOYABILITY & CAREERS

For other Future Career Sheets visit: www.aut.ac.nz/careersheets For employability and career support, AUT students can book an appointment through https://elab.aut.ac.nz/

FUTURE STUDENTS

Contact the Future Student Advisory team for more information: www.aut.ac.nz/enquire futurestudents@aut.ac.nz f @AUTFutureStudents

CURRENT AUT STUDENTS

Contact the Student Hub Advisors team for more information: 0800 AUT UNI (0800 288 864) www.aut.ac.nz/enquire studenthub@aut.ac.nz f @AUTEmployabilityandCareers

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The information contained in this career sheet is correct at time of printing, early 2022.

