INDUSTRY SKILLS FRAMEWORK:
SOFTWARE APPLICATIONS

SOFTWARE ENGINEER
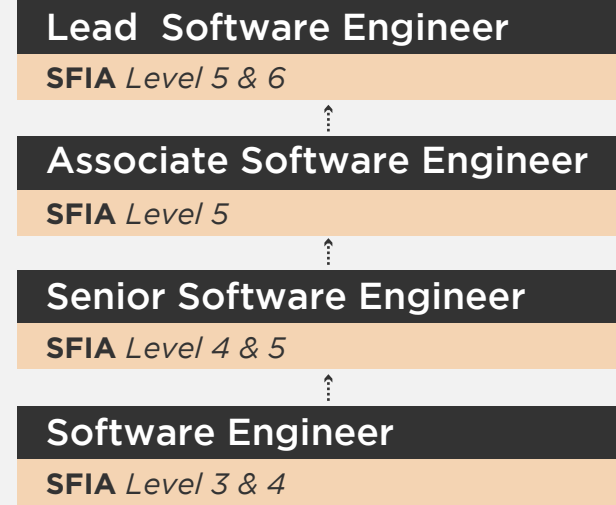
Career Pathway

Lead Software Engineer
SFIA *Level 5 & 6*

Associate Software Engineer
SFIA *Level 5*

Senior Software Engineer
SFIA *Level 4 & 5*

Software Engineer
SFIA *Level 3 & 4*

Skills Framework for the Information Age (SFIA)
Level 7 - Set strategy, inspire, mobilise
Level 6 - Initiate/influence
Level 5 - Ensure/advise
Level 4 - Enable
Level 3 - Apply
Level 2 - Assist
Level 1 - Follow

Commonly Used Tools/New Tech

- Software Development
- Java
- JavaScript
- SQL
- HTML
- C++
- C#
- Programming
- CSS
- MySQL

Job Description

- Leads important projects and possesses capability to make breakthroughs in design, development, testing, debugging and implementing software applications or specialised utility programs in support of end users' needs on platforms.
- Plans and coordinates regular updates and recommends improvements to existing applications.
- Identifies and resolves issues which have organisation wide and long-term impact.
- Identifies security risks, creates requirements to capture security issues, and performs initial threat modelling to ensure coding standards meets security requirements.
- Develops and maintains the Software Configuration Management plan and oversees the building, verification and implementation of software releases.
- Works in a team setting and is proficient in programming languages required by the organisation.
- Familiar with software development tools & standards as well as the relevant software platforms on which the solution is deployed on.
- Imaginative and creative in exploring a range of application designs and solutions.
- Provides guidance and technical support to the quality testing teams.
- Able to engage and support others in the team, readily put forth his ideas in a clear and compelling manner.

Competencies

- Artistic talent and technical skills
- A good eye for detail
- Analyse user and business requirements
- Networking skills and commitment to projects through previous work experience
- Articulation Knowledge
- Translate user requirements into technical specifications
- Provide technical guidance on proposed solutions & alternatives
- Ability to recommend approaches that balance security, stability, and performance needs

Soft Skills

- Mathematical aptitude
- Problem-solving
- Time management
- Organization & Planning
- Critical Thinking
- Accuracy and attention to detail
- Understand the latest trends & their role in a commercial environment
- Communication & Teamwork
- Self-development (to keep up to date with fast-changing trends)
- Agile Methodology
- Design Thinking
- Business Analysis

Essentials/Core Skills

- Agile Software Development
- Applications: Development & Integration
- Business Needs Analysis
- Continuous Integration and Deployment
- Database Administration
- Emerging Technology Synthesis
- Project Management
- Security Architecture
- Solution Architecture
- Software: Design, Configuration & Testing
- System Integration
- Test Planning
- User Interface Design

Common Certifications

- Strategyex Certificate (Associate or Master's) in Agile.
- BM Certified Database Administrator – DB2
- Microsoft SQL Server database certifications
- Oracle Certified Professional, MySQL Database Administrator
- Oracle Database 12c Administrator
- Docker Certified Associate
- Certified Kubernetes Administrator (CKA)
- Certified Kubernetes Application Developer (CKAD)
- AWS Certified DevOps Engineer Professional Exam
- Azure DevOps Solution Certification Exam
- Architecting With Google Cloud Platform
- Programming in HTML5 with Javascript & CSS3
- Microsoft Certified: Azure Solutions Architect Expert

SOFTWARE ARCHITECT

Career Pathway

Lead Software Architect
SFIA *Level 6 & 7*

Associate Software Architect
SFIA *Level 5 & 6*

Senior Software Architect
SFIA *Level 4 & 5*

Software Architect
SFIA *Level 3 & 4*

Skills Framework for the Information Age (SFIA)
Level 7 - Set strategy, inspire, mobilise
Level 6 - Initiate/influence
Level 5 - Ensure/advise
Level 4 - Enable
Level 3 - Apply
Level 2 - Assist
Level 1 - Follow

Commonly Used Tools/New Tech
- Software Development
- Java
- SQL
- JavaScript
- Agile Methodologies
- C#
- XML
- C++
- Linux
- Microsoft SQL Server
- Software Devp Life Cycle (SDLC)
- Architecture Security
- System Integration
- Docker Products
- Amazon Web Services (AWS)
- Microsoft Azure
- Machine Learning
- Jenkins

Job Description
- Analyses, designs and develops roadmaps and implementation plans based on a current versus future state business architecture, and reviews recommendations to software architectural standards for approval.
- Leads and facilitates the software architecture governance process based on the enterprise architecture governance structure, and manages exceptions to architectural standards at a software level.
- Assesses near-term needs to establish business priorities and aligns architectural requirements with IT strategy.
- Consults with clients and IT teams on software architecture solutions and provides recommendations on emerging technology to senior management.
- Oversees the development of guidelines and standards to be used in software development and integration, and formulates the conceptual and detailed architecture for the development of applications.
- Works in a team setting and is proficient in programming languages required by the organisation.
- Familiar with software development tools and standards, as well as the relevant software platforms and embedded systems on which the software solution is deployed on.
- Imaginative and creative, drawing connections from diverse disciplines to develop application architectures and solutions.
- Enjoys the challenge of analysing, resolving complex issues and able to interact effectively with others to gain buy-in where required.

Competencies
- Formulate the organisation's architecture strategy, roadmap, standards, policies and procedures, and governance
- A good eye for detail
- Formulate the conceptual and detailed architecture for the development of applications
- Networking skills and commitment to projects through previous work experience.
- Develop architecture requirements and maintain oversight
- Manage quality and continuous improvement of architecture
- Provide technical guidance on proposed solutions and alternatives
- Ability to recommend approaches that balance security, stability and performance needs

Soft Skills
- Mathematical aptitude
- Problem-solving
- Time management
- Organization & Planning
- Critical Thinking
- Accuracy and attention to detail
- Understand the latest trends & their role in a commercial environment
- Communication & Teamwork
- Self-development (keep up to date with fast-changing trends)
- Agile Methodology
- Business Analysis & Design Thinking

Essentials/Core Skills
- Applications Development
- Applications Integration
- Applications Support and Enhancement
- Problem Management
- Project Management
- Quality Standards
- Security Architecture
- Software: Design, Configuration & Testing
- Solution Architecture
- Strategy Planning
- System Integration
- Test Planning

Common Certifications
- Microsoft certification Programming in C#
- AWS Certified SysOps Administrator.
- Microsoft Certified: Azure Solutions Architect Expert.
- Microsoft certification Programming in HTML5 with Javascript and CSS3
- ArchiMate 3 Foundation & Practitioner
- Architecting Software with OOAD & UML (ASOOAD)
- Certified IT Architect Associate – Information Architecture
- Developer Training for SPARK and Hadoop
- Programming in HTML5 with Javascript and CSS3

SOLUTION ARCHITECT

Career Pathway

Lead Solution Architect
SFIA Level 6 & 7

Associate Solution Architect
SFIA Level 4 & 5 & 6

Senior Solution Architect
SFIA Level 4 & 5

Solution Architect
SFIA Level 3 & 4

Skills Framework for the Information Age (SFIA)
Level 7 - Set strategy, inspire, mobilise
Level 6 - Initiate/influence
Level 5 - Ensure/advise
Level 4 - Enable
Level 3 - Apply
Level 2 - Assist
Level 1 - Follow

Commonly Used Tools/New Tech
- Software Development
- Java
- SQL
- JavaScript
- Agile Methodologies
- C#
- XML
- C++
- Linux
- Microsoft SQL Server
- Software Devp Life Cycle (SDLC)
- Architecture Security
- System Integration
- Docker Products
- Amazon Web Services (AWS)
- Microsoft Azure
- Machine Learning
- Jenkins

Job Description
- Responsible for translating the vision for the project to the development team and plays a pivotal part throughout the entire systems development lifecycle. They are also involved in future updates to the solution.
- Charged with converting predetermined elements into a design used by architects as a blueprint.
- Seeks to balance various aspects of the project, from safety to design.
- Researches advanced technologies and approaches regarding best practices in the field.
- Generally located within a large company and work alongside other professionals to bring their plans to life

Competencies
- Formulate the organisation's architecture strategy, roadmap, standards, policies and procedures, and governance
- A good eye for detail
- Project management and leadership skills
- Experience developing IT and cloud infrastructure
- Current understanding of best practices regarding system security measures
- Experience in software engineering and design architecture
- Positive outlook in meeting challenges and working to a high level
- Advanced understanding of business analysis techniques and processes
- Professional experience working with and analyzing computer hardware and software
- Extensive knowledge and experience working with operating systems

Soft Skills
- Mathematical aptitude
- Problem-solving
- Time management
- Organization & Planning
- Critical Thinking
- Accuracy and attention to detail
- Understand the latest trends & their role in a commercial environment
- Communication & Teamwork skills
- Self-development (to keep up to date with fast-changing trends)
- Agile Methodology
- Design Thinking
- Business Analysis

Essentials/Core Skills
- Analyzing the technology environment
- Business Analysis
- Setting the collaboration framework
- Creating a solution prototype
- Participating in technology selection
- Controlling solution development
- Project management
- Engineering and software architecture design
- Cloud development

Common Certifications
- Microsoft certification Programming in C#
- AWS Certified SysOps Administrator.
- Microsoft Certified: Azure Solutions Architect Expert
- AWS Certified Solutions Architect
- Agile Project Management Foundation Certification
- Certified It Architect Associate – Information Architecture

APPLICATION DEVELOPER

Career Pathway

Lead App Developer
SFIA *Level 6*

Associate App Developer
SFIA *Level 5*

Senior App Developer
SFIA *Level 3 & 4*
NOSS *IT-010-3:2016 Application Development*

Application Developer
SFIA *Level 3*

Skills Framework for the Information Age (SFIA)
Level 7 - Set strategy, inspire, mobilise
Level 6 - Initiate/influence
Level 5 - Ensure/advise
Level 4 - Enable
Level 3 - Apply
Level 2 - Assist
Level 1 - Follow

Commonly Used Tools/New Tech
- Android
- iOS Development
- JavaScript
- SQL
- HTML
- C++
- Swift (Programming Language)
- Kotlin
- Retrofit
- React Native

Job Description
- Responsible for directing, directing, and examining the quality and timeliness of other professional professional systems.
- Work on the most difficult or complicated system.
- Provide expertise in determining strategic technical direction and system architecture for initiatives.
- Developing software solutions to meet customer needs.
- Creating and implementing the source code of new applications.
- Testing source code and debugging code.
- Evaluating existing applications and performing updates and modifications
- Propose solution based on client's requirements in developing application programming interfaces (APIs) to support web and mobile functionality.
- Keeping up to date with the terminology, concepts and best practices for coding for web and mobile.
- Working closely with colleagues to constantly innovate app functionality and design

Competencies
- Understand business needs and user requirements.
- Support the development of the applications concept, interface design, and architecture.
- Support the development of program logic for new apps & features.
- Drive to keep up to date with developments and trends in the tech and modern media world.
- Integrate applications with back-end databases Support testing of the developed applications.
- The ability to learn quickly.
- The ability to interpret and follow technical plans.

Soft Skills
- Agile Problem-Solving
- Business Acumen
- Communication
- Critical & Analytical Skills
- Strong Communication
- Team building
- Time Management
- Self-development (keep up to date with fast-changing trends)
- Design Thinking

Essentials/Core Skills
- Applications: Development & Integration
- Applications Support and Enhancement
- Problem Management
- Project Management
- Quality Standards
- Security Architecture
- Software: Design, Configuration & Testing
- Solution Architecture
- Strategy Planning
- System Integration
- Test Planning

Common Certifications
- IBM Certified Mobile Application Developer
- App Development Courses - edX
- Associate Android Developer (Google)
- GIAC Mobile Device Security Analyst
- MCSD: App Builder (Microsoft)
- MTA Developer (Microsoft)
- Salesforce Certified Platform App Builder
- Agile Project Management Foundation Certification
- Android Application Development Certification
- ArchiMate 3 Foundation & Practitioner
- Developing ASP.Net Core MVC Web Applications
- Developer Training For Spark and Hadoop
- Mobile App Development Using Flutter
- Python Programming I (PP1)

WEB DEVELOPER

Career Pathway

Lead Web Developer
SFIA *Level 6*
NOSS *IT-052-5:2013 Web Development*

Associate Web Developer
SFIA *Level 4 & 5*

Senior Web Developer
SFIA *Level 3 & 4*
NOSS *IT-052-4:2013 Web Development*

Web Developer
SFIA *Level 3*

Skills Framework for the Information Age (SFIA)
Level 7 - Set strategy, inspire, mobilise
Level 6 - Initiate/influence
Level 5 - Ensure/advise
Level 4 - Enable
Level 3 - Apply
Level 2 - Assist
Level 1 - Follow

Commonly Used Tools/New Tech
- Java Script
- HTML5
- CSS
- PHP5
- SQL
- ASP.net
- Jquery
- Vue.js
- node.js
- React.js
- AngularJS
- Web Designing
- Back-End Web Development
- JSON API Development
- TypeScript
- Responsive Web Design
- Storyboarding

Job Description
- Responsible for the coding, design and layout of a website according to a company's specifications.
- As the role takes into consideration user experience and function, a certain level of both graphic design and computer programming is necessary.
- Create the site's layout and integrate graphics, applications (such as a retail checkout tool), and other content.
- Write web design programs in a variety of computer languages, such as HTML or JavaScript

Competencies
- Understand business needs and user requirements
- Support the development of the applications concept, interface design, and architecture
- Support the development of program logic for new applications and features.
- Drive to keep up to date with developments and trends in the tech and modern media world
- Integrate applications with back-end databases
- Support testing of the developed applications
- The ability to learn quickly
- The ability to interpret and follow technical plans
- Detail-oriented and multitasking

Soft Skills
- Agile Problem-Solving
- Business Acumen
- Communication
- Critical & Analytical Skills
- Strong Communication
- Team building
- Time Management
- Self-development (keep up to date with fast-changing trends)
- Design Thinking

Essentials/Core Skills
- Web Development
- Web Integration
- Web Support and Enhancement
- Interpret website and product mockups and wire frames
- Search engine optimization.
- Responsive design skills.
- Troubleshoot website
- Strategy Planning
- Understand the way servers and database communicate
- Testing and debugging skills.

Common Certifications
- ACE Web Specialist (Adobe)
- Google Analytics Individual Qualification (IQ)
- Google AdWords
- MCSD (Microsoft)
- MTA: HTML5 App Development (Microsoft)
- Zend Certified PHP Engineer
- Agile Project Management Foundation Certification
- ASP.NET CORE 3 Development
- Developer Training for SPARK & Hadoop
- Python Programming I (PP1)

USER INTERFACE (UI) DESIGNER

Career Pathway

Lead UI Designer
SFIA *Level 5*

NOSS *IT-058-5:2016 Communication Design (Digital)*

Senior UI Designer
SFIA *Level 3 & 4*

NOSS *IT-058-4:2016 Graphic Design Application (Digital)*

UI Designer
SFIA *Level 3*

NOSS *IT-058-3:2014 Graphic Design (Digital)*
NOSS *J582-001-3:2019 Interactive Multimedia Design*

Skills Framework for the Information Age (SFIA)
Level 7 - Set strategy, inspire, mobilise
Level 6 - Initiate/influence
Level 5 - Ensure/advise
Level 4 - Enable
Level 3 - Apply
Level 2 - Assist
Level 1 - Follow

Commonly Used Tools/New Tech
- User Flows
- Figma (Software)
- Mockups
- Prototyping
- UX Research
- Adobe XD
- Visual Design
- Adobe Photoshop
- Adobe Illustrator
- Mobile Application Design

Job Description
- Determines business needs and user requirements for UI design.
- Formulates technical specifications and delivery platform requirements for UI.
- Translates content and layout into an intuitive and responsive experience for users, and manages the design of UI elements for projects to ensure consistency and alignment to overall concept.
- Ensures that the UI visually communicates the path that a user experience designer has laid out.
- Oversees the conduct of usability testing to validate UIs, implementation of UIs, and analyses design audits for improvements.
- Works in a team and is proficient in programming languages required by the organisation to design and develop user interfaces.
- Familiar with various graphic designing tools, as well as Universal Principles of Design and commonly used Design Methods.
- Imaginative and innovative in designing new and improved user interfaces.
- Adopts a structured approach when managing projects and performing testing.
- Keeps an open mind and leverages varying sources of information and data analytics to derive trends and identify potential design improvements.
- Able to communicate his ideas to team members and other stakeholders in a clear and compelling manner.

Competencies
- Liaise with stakeholders to understand business needs and user requirements
- Perform the requirements analysis for the design of user interfaces
- Formulate specifications and definition of delivery platforms for UI
- Develop the design of each screen or page with which a user interacts
- Program interfaces to accomplish specific tasks
- Ensure that the user interface visually communicates the path that a user experience designer has laid out
- Create a cohesive style guide to ensure that a consistent design language is applied across the product
- Apply user interface design performance indicators, monitoring and reporting standards Support user interface design audits and regulatory inspections
- Evaluate the effectiveness of user interface to visually guide the user through a product's interface across all platforms
- Recommend modifications in the design of user interface based on usability test findings
- Monitor the user interface to ensure effective reflection of a brand's strengths and visual assets to a product's interface
- Design frameworks for quantitative analysis and inspection procedures
- Conduct quantitative analysis and inspection
- Measure outcomes of user interface design improvements using metrics and benchmarking criteria

Soft Skills
- Critical Thinking & Problem-solving
- Excellent organisational & time management
- Continuous Learning (Understands the latest trends and their role in a commercial environment
- Communication & Teamwork
- Self-development (keep up to date on fast-changing trends)
- Agile Methodology
- Design Thinking
- Business Analysis & User Research
- ArtSense, Creativity & Innovative
- Empathy & Persuasive Skills

Essentials/Core Skills
- User Interface and User Experience Design
- Storyboarding
- Web and Graphic Design
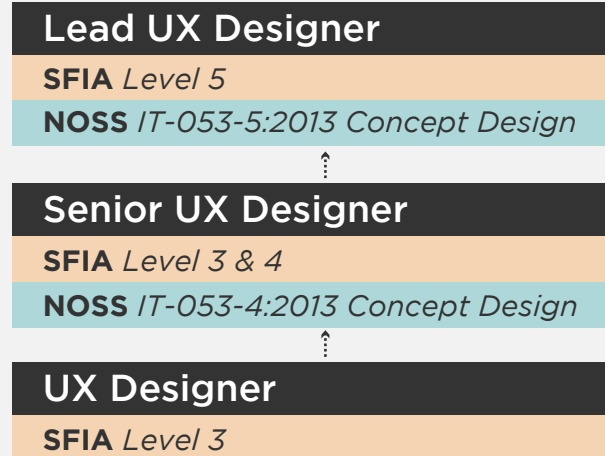- Design Thinking
- User Experience (UX) Research

Common Certifications
- Nielsen Norman Group: UX and UX Master Certification
- GeneralAssemb.ly: User Experience Design Immersive
- Certified Usability Analyst or Certified User Experience Analyst
- Udemy: The Ultimate Guide to Usability and UX
- React Development (REA) Certification
- UI Certification : Wireframe & Prototyping
- Adobe Certified Associate (ACA): Adobe Ilustrator

USER EXPEREINCE (UX) DESIGNER

Career Pathway

Lead UX Designer
SFIA *Level 5*
NOSS *IT-053-5:2013 Concept Design*

Senior UX Designer
SFIA *Level 3 & 4*
NOSS *IT-053-4:2013 Concept Design*

UX Designer
SFIA *Level 3*

Skills Framework for the Information Age (SFIA)
Level 7 - Set strategy, inspire, mobilise
Level 6 - Initiate/influence
Level 5 - Ensure/advise
Level 4 - Enable
Level 3 - Apply
Level 2 - Assist
Level 1 - Follow

Commonly Used Tools/New Tech
- User Experience Design (UED)
- Adobe Photoshop
- Graphis Design
- Interaction Design
- Wireframing
- Adobe XD
- MS Visio
- Google Slides
- Draw IO
- Figma (Software)

Job Description
- Designs and develops engaging user experiences (UX) for a variety of applications.
- Studies and evaluates how users feel about the interface.
- Supports the translation of user needs and business requirements into features and functionalities that enhance app experiences.
- Involved in the development of process flows, wireframes, and prototypes to effectively conceptualise and communicate high-level design strategies.
- Works under limited supervision to effectively deal with unfamiliar issues.
- Analytical in the evaluation of user feedback and offers fresh perspectives and suggestions to optimise the user experience.
- Articulate and comfortable with brainstorming and putting forth his ideas to team members and other stakeholders to co-create an ideal user experience.

Competencies
- Analyse which design option best satisfies user needs
- Support refinements and iterations based on usability testing results to create the best user experience
- Support the exploration of different approaches to solving a specific user problem
- Collect user feedback on user interface performance
- Implement application site improvements to functionalities, design and navigation
- Support the development of personas and usage scenarios
- Support the design of user journeys and development of wireframes to enable effortless navigation
- Execute design work consistent with design and brand standards, analytics insight, customer feedback
- Document design standards, design wireframes, mockups, specifications and patterns across channels and products
- Support all phases of usability testing of prototypes in the lab and remote settings
- Designs and develops engaging user experiences for variety of apps.
- Conduct in-person user tests to observe user behaviour
- Support secondary research on market, industry trends, competitors, and comparable experiences
- Support user research conducted through multiple tools
- Focus on enhancing customer satisfaction and loyalty
- Coordinates with the Project Manager to communicate desired requirements and objectives clearly to other teams (i.e. UX team, QA testers)

Soft Skills
- Critical Thinking & Problem-solving
- Excellent organisational and time management skills
- Continuous Learning (Understands the latest trends and their role in a commercial environment)
- Communication & Teamwork
- Self-development (keep up to date with fast-changing trends)
- Agile Methodology & Design Thinking
- Business Analysis & User Research
- ArtSense, Creativity & Innovative
- Empathy & Persuasive Skills

Essentials/Core Skills
- User Experience, flows & journey
- Design Thinking
- Adobe XD
- Mockups
- Mobile Design
- Ergonomics
- Wireframing
- Brand Experience / UI Brand Guideline

Common Certifications
- Nielsen Norman Group: UX and UX Master Certification
- GeneralAssemb.ly: User Experience Design Immersive
- Certified Usability Analyst or Certified User Experience Analyst
- Udemy: The Ultimate Guide to Usability and UX
- React Development (REA) Certification
- Adobe Certified Associate: VFX & motion graphics using Adobe After Effects
- UX Certification : Wireframe & Prototyping

SOFTWARE TESTER

Career Pathway

Lead Software Quality Assurance
SFIA *Level 6*

↕

Software Quality Assurance
SFIA *Level 4 & 5*

↕

Software Security Engineer
SFIA *Level 3 & 4*

↕

Software Tester
SFIA *Level 3*

Skills Framework for the Information Age (SFIA)
Level 7 - Set strategy, inspire, mobilise
Level 6 - Initiate/influence
Level 5 - Ensure/advise
Level 4 - Enable
Level 3 - Apply
Level 2 - Assist
Level 1 - Follow

Commonly Used Tools/New Tech
- Software Testing
- Manual Testing
- Robotic Process Automation (RPA)
- Test Cases
- Regression Testing
- Git
- Postman
- .API Testing
- Cucumber
- Test Execution

Job Description
- Responsible in the quality assurance stage of software development and deployment.
- Required to conduct automated and manual tests to ensure the software created by developers is fit for purpose and any bugs or issues are removed within a product before it gets deployed to everyday users.
- Assess and test the overall effectiveness and performance of an application, involving the setting up of suitable testing conditions, definition of test cases and/or technical criteria

Competencies
- Knowledge of a broad range of software applications and of hardware and networks
- Strong programming knowledge
- A good understanding of business
- Ability to think in the abstract and see how small details fit into the bigger picture
- A creative mindset – and the ability to approach a problem creatively
- Good communications skills, both written and verbal
- Strong IT skills
- A meticulous approach to work
- Ability to use logic and reasoning to identify the strengths and weaknesses of IT system

Soft Skills
- Agile Problem-Solving
- Business Acumen
- Communication
- Critical & Analytical Skills
- Strong Communication
- Team building
- Excellent organisational and time management skills
- Accuracy
- Data Analysis

Essentials/Core Skills
- Unit Testing
- Integration Testing
- Quality Assurance
- Acceptance Testing
- Test Automation
- System Testing
- Java
- Manual Testing
- Test Cases
- Regression Testing

Common Certifications
- Certified Test Engineer (CSTE)
- Certified Tester Foundation Level (CTFL)
- Certified Associate in Software Testing (CAST)
- International Software Testing Qualifications Board (ASTQB)
- International Software Testing Qualifications Board (ISTQB)
- Certified in Testing Essentials (AT*Essentials)
- DevOps Foundation Certification

SOFTWARE QUALITY ASSURANCE

Career Pathway

Lead Software Quality Assurance
SFIA *Level 6*

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Software Quality Assurance
SFIA *Level 4 & 5*

↕

Software Security Engineer
SFIA *Level 3 & 4*

↕

Software Tester
SFIA *Level 3*

Skills Framework for the Information Age (SFIA)
Level 7 - Set strategy, inspire, mobilise
Level 6 - Initiate/influence
Level 5 - Ensure/advise
Level 4 - Enable
Level 3 - Apply
Level 2 - Assist
Level 1 - Follow

Commonly Used Tools/New Tech
- Postman API
- Bug Tracking
- API Testing
- Software Testing Life Cycle (STLC)
- JMeter
- TestNG
- Github
- Jenkins
- Analytical Skills
- Git

Job Description
- Oversees and plans quality control tests and analysis of software to meet or exceed specified standards and end user requirements.
- Manages professional employees, sets priorities, testing parameters and quality assurance automation frameworks and has accountability for the performance and results of the team.
- Develops departmental plans and priorities to address resource and operational challenges.
- Guides decisions and problem-solving through policies and procedures and business plan.
- Provides technical guidance to stakeholders and advocates quality assurance best practices.
- Able to readily integrate and apply knowledge from multiple disciplines across software and quality assurance.
- Able to develop innovative and effective solutions to issues encountered, communicate his plans and advice in a clear and compelling manner that inspires action.

Competencies
- Develop software quality guidelines
- Translate content and layout into an intuitive and responsive interface experience for users
- Understanding software and design structure and guide quality assurance testing
- Manage quality and continuous improvement of architecture
- Optimise quality assurance processes
- Ability to recommend approaches that balance security, stability, and performance needs.
- Support the team in preliminary quality insurance requirements assessments & potential risk assessments

Soft Skills
- Agile Problem-Solving
- Business Acumen
- Communication
- Critical & Analytical Skills
- Strong Communication
- Team building
- Excellent organisational and time management skills
- Accuracy
- Data Analysis

Essentials/Core Skills
- Software Development
- Software Quality Assurance
- Quality Assurance
- SQL
- Test Automation
- Agile Methodologies
- Java
- Manual Testing
- Test Cases
- Regression Testing

Common Certifications
- Certified Test Engineer (CSTE)
- Certified Software Quality Analyst (CSQA)
- Certified Associate in Software Testing (CAST)
- Certified Manager of Software Quality (CMSQ)
- International Software Testing Qualifications Board (ISTQB)
- Agile Project Management Foundation Certification

SECURITY SOFTWARE ENGINEER

Career Pathway

Lead Software Quality Assurance
SFIA *Level 6*

Software Quality Assurance
SFIA *Level 4 & 5*

Software Security Engineer
SFIA *Level 3 & 4*

Software Tester
SFIA *Level 3*

Skills Framework for the Information Age (SFIA)
Level 7 - Set strategy, inspire, mobilise
Level 6 - Initiate/influence
Level 5 - Ensure/advise
Level 4 - Enable
Level 3 - Apply
Level 2 - Assist
Level 1 - Follow

Commonly Used Tools/New Tech
- Software Testing
- Manual Testing
- Robotic Process Automation (RPA)
- Test Cases
- Regression Testing
- Git
- Postman
- .API Testing
- Cucumber
- Test Execution

Job Description
- Responsible for planning,developing, implementing and maintaining the overall company's software security strategy using various software security testing methods and techniques.
- Implementing, testing and operating advanced software security techniques in compliance with technical reference architecture.
- Performing on-going security testing and code review to improve software security.
- Troubleshooting and debugging issues that arise.
- Analyze software designs and implementations from a security perspective, and identify and resolve security issues.

Competencies
- Knowledge of a broad range of software applications and of hardware and networks.
- Able to articulate, plan, implement and manage software security best practices
- In-depth knowledge of various web-related technologies (suc as Web applications, services, architectures etc.)
- Experience with building virtual or physical appliances
- Critical thinker and problem-solving skills
- Team player
- Good time-management skills
- Great interpersonal and communication skills
- Ability to use logic and reasoning to identify the strengths and weaknesses of IT system

Soft Skills
- Agile Problem-Solving
- Business Acumen
- Communication
- Critical & Analytical Skills
- Strong Communication
- Team building
- Excellent organisational and time management skills
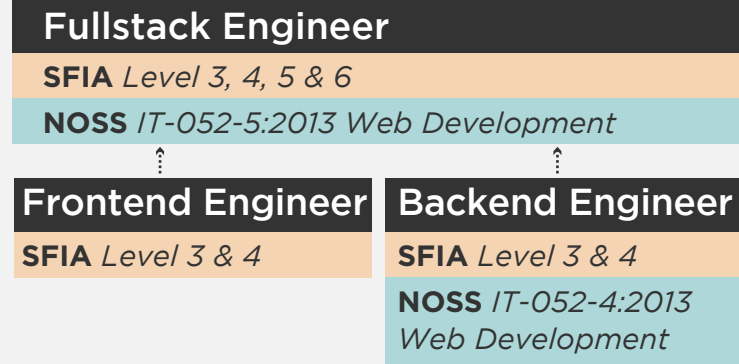- Accuracy
- Data Analysis

Essentials/Core Skills
- Unit Testing
- Integration Testing
- Quality Assurance
- Acceptance Testing
- Test Automation
- System Testing
- Java
- Manual Testing
- Test Cases
- Regression Testing

Common Certifications
- Certified Test Engineer (CSTE)
- Certified Tester Foundation Level (CTFL)
- Certified Associate in Software Testing (CAST)
- International Software Testing Qualifications Board (ASTQB)
- International Software Testing Qualifications Board (ISTQB)
- Certified in Testing Essentials (AT*Essentials)
- COBIT 2019 Foundation

FULLSTACK ENGINEER

Career Pathway

Fullstack Engineer
SFIA *Level 3, 4, 5 & 6*
NOSS *IT-052-5:2013 Web Development*

Frontend Engineer	Backend Engineer
SFIA *Level 3 & 4*	**SFIA** *Level 3 & 4*
	NOSS *IT-052-4:2013 Web Development*

Skills Framework for the Information Age (SFIA)
Level 7 - Set strategy, inspire, mobilise
Level 6 - Initiate/influence
Level 5 - Ensure/advise
Level 4 - Enable
Level 3 - Apply
Level 2 - Assist
Level 1 - Follow

Commonly Used Tools/New Tech
- Full-Stack Development
- Back-End Web Development
- Spring Boot
- NoSQL
- Front-end Development
- Vue.js
- TypeScript
- React Native
- Docker Products
- Redux.js

Job Description
- Works on both client-side and server-side software.
- Works on the Full Stack of an application meaning Front End Technology, Back End Development Languages, Database, Server, API, and version Controlling Systems. Hence, the name "Full Stack" Developer.
- Translates user requirements into the overall architecture and implement the new systems.
- Doesn't necessarily master all technologies. However, the professional is expected to work on the client as well as server sides and understand what is going on when developing an application.
- Has a genuine interest in all software.

Competencies
- Ability to work on both in the front end & back-end of any application.
- Ability to analyse for every part of the system running smoothly.
- Knowledge of various DBMS technology example MySQL, MongoDB, Oracle, SQLServer
- Ability to understand principle of basic prototype design & UI /UX design.
- Exposure to handling Apache or nginx servers is desirable
- Master of essential front-end technologies like HTML5, CSS3, JavaScript.
- Knowledge of third-party libraries like jQuery, LESS, Angular and React JS
- Knowledge of web services or API

Soft Skills
- Mathematical aptitude/ Computational Thinking
- Problem-solving skills
- Excellent organisational and time management skills
- Critical Thinking
- Understand the latest trends and their role in a commercial environment
- Communication & Teamwork skills
- Self-development (keep up to date with fast-changing trends)
- Agile Methodology
- Design Thinking
- Business Analysis
- Creativity & Innovative
- Persuasive Skills
- Strategic Thinking

Essentials/Core Skills
- Front-end technology
- Development Languages
- Databases and Web Storage
- Web Design & Architecture
- Backend Technology
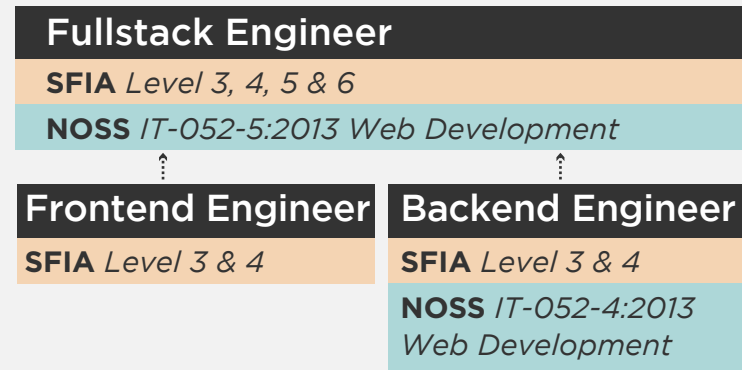- Working with API and version control systems

Common Certifications
- The Advanced Full Stack Developer Bootcamp
- Full Stack Developer Course
- Full Stack Web and Multiplatform Mobile App Development
- Full Stack Developer Course
- Certificate in Full Stack Web & App Development
- Programming in HTML5 with Javascript & CSS3
- DataStax Professional Certification on Apache Cassandra.
- Cloudera Certified Professional (CCP) Data Engineer.
- Oracle Platform as a Service (PaaS) Certification
- Certified OpenStack Administrator
- Chef Certification
- HDP Certified Developer (HDPCD)
- Zend Certified PHP Engineer
- Professional Certificate in Front End Web Development by W3C
- Front End Web Development with React

BACKEND DEVELOPER

Career Pathway

Fullstack Engineer
SFIA *Level 3, 4, 5 & 6*
NOSS *IT-052-5:2013 Web Development*

Frontend Engineer	Backend Engineer
SFIA *Level 3 & 4*	**SFIA** *Level 3 & 4*
	NOSS *IT-052-4:2013 Web Development*

Skills Framework for the Information Age (SFIA)
Level 7 - *Set strategy, inspire, mobilise*
Level 6 - *Initiate/influence*
Level 5 - *Ensure/advise*
Level 4 - *Enable*
Level 3 - *Apply*
Level 2 - *Assist*
Level 1 - *Follow*

Commonly Used Tools/New Tech
- REST API
- Back-End Web Development
- Kubernetes
- Microservices
- Spring Boot
- TypeScript
- Vue.js
- NoSQL
- Express.js
- React.js

Job Description
- A programmer who creates the business logic of a software application or information system.
- Typically creates components and features that are indirectly accessed by a user through a frontend application or system.
- The back-end team may need to create an application around the front-end and support it. Moreover, they need to make sure that the website opens up and functioning properly.

Competencies
- Well organized, detail oriented, ability to multi-task, excellent time-management, planning and prioritization
- Knowledge of Mobile web development or cloud app development
- Proficient in the use of version control/source code management tools
- Knowledge of CMS and CRM platforms, (Salesforce & Adobe AEM/CQ)
- Excellent communication skills, both verbal and written
- Experience in writing re-usable unit test documents
- Strong organizational and communication skills
- Skilled in performance tuning, query plan / explain plan analysis, indexing, table partitioning
- Exceptional knowledge of Database technologies – RDBMS/NoSQL
- Excellent verbal, interpersonal & written communication skills

Soft Skills
- Mathematical aptitude
- Critical Thinking and Problem-solving
- Time management
- Organization & Planning
- Accuracy and attention to detail
- Understand the latest trends and their roles in a commercial environment
- Communication & Teamwork skills
- Self-development (keep up to date with fast-changing trends)
- Agile Methodology
- Design Thinking
- Business Analysis
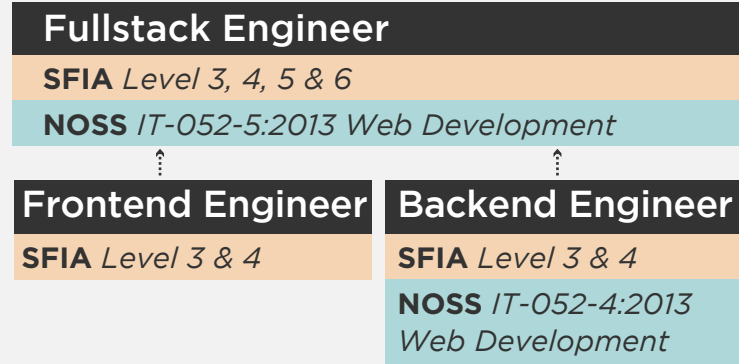
Essentials/Core Skills
- Proficient knowledge of the back-end programming language and the framework used by the company
- Understanding of front-end web technologies like HTML, CSS & JavaScript (to communicate with team members on the front-end)
- Ability to manage a hosting environment, including database administration as well as scaling applications to handle load changes
- Knowledge of accessibility and security compliance
- Experience with version control, such as Git

Common Certifications
- DataStax Professional Certification on Apache Cassandra
- Cloudera Certified Professional (CCP) Data Engineer
- Oracle Platform as a Service (PaaS) Certification
- Certified OpenStack Administrator
- Chef Certification
- HDP Certified Developer (HDPCD)
- Puppet Certified Professional
- Agile Project Management Foundation Certification
- Programming in HTML5 with Javascript and CSS3

FRONTEND DEVELOPER

Career Pathway

Fullstack Engineer
SFIA *Level 3, 4, 5 & 6*
NOSS *IT-052-5:2013 Web Development*

Frontend Engineer
SFIA *Level 3 & 4*

Backend Engineer
SFIA *Level 3 & 4*
NOSS *IT-052-4:2013 Web Development*

Skills Framework for the Information Age (SFIA)
Level 7 - Set strategy, inspire, mobilise
Level 6 - Initiate/influence
Level 5 - Ensure/advise
Level 4 - Enable
Level 3 - Apply
Level 2 - Assist
Level 1 - Follow

Commonly Used Tools/New Tech
- Back-End Web Development
- TypeScript
- Vue.js
- Docker Products
- React Native
- Node.js
- Redux.js
- Amazon Web Services (AWS)
- React.js
- Responsive Web Design

Job Description
- Design the look of the website, by taking user's inputs and modifying it through testing.
- Ensure the website is accessible to all users, and it remains responsive in all views - mobile and desktop.
- Requires a computer science degree and years of software development experience.
- When the word "JavaScript Application" is included in the job title, this will denote that the developer should be an advanced JavaScript developer possessing advanced programming, software development, and application development skills (i.e has years of experience building front-end applications).

Competencies
- Determining the structure and design of web pages.
- Ensuring user experience determines design choices.
- Developing features to enhance the user experience.
- Striking a balance between functional and aesthetic design.
- Ensuring web design is optimized for smartphones.
- Building reusable code for future use.
- Optimizing web pages for maximum speed and scalability.
- Utilizing a variety of markup languages to write web pages.
- Maintaining brand consistency throughout design.

Soft Skills
- Mathematical aptitude
- Problem-solving skills
- Time management skills
- Organization & Planning
- Critical Thinking
- Accuracy and attention to detail
- An understanding of the latest trends and their role in a commercial environment
- Communication & Teamwork skills
- Self-development skills to keep up to date with fast-changing trends
- Agile Methodology
- Design Thinking
- Business Analysis

Essentials/Core Skills
- Proficient in coding languages such as HTML, CSS, JavaScript, and jQuery
- Understand server-side CSS
- Be experienced with graphic design applications (e.g. Adobe Illustrator)
- Understand the principles of SEO
- Have excellent skills in problem-solving
- Be proficient in communicating with team members and clients
- Have good interpersonal skills

Common Certifications
- Frontend Developer UdX
- Google AdWords
- MCSD (Microsoft)
- MTA: HTML5 App Development (Microsoft)
- Zend Certified PHP Engineer
- Professional Certificate in Front End Web Development by W3C
- Front End Web Development with React
- Front End Web Development Nanodegree by Udacity
- Web Developer Bootcamp on Udemy
- Front End Web Developer Learning Path on LinkedIn
- Web Design for Everybody Specialization by University of Michigan
- Front End with React by Codecademy
- Agile Project Management Foundation Certification

SOFTWARE DESIGNER

Career Pathway

Lead Software Engineer
SFIA *Level 5 & 6*

↕

Senior Software Designer
SFIA *Level 3 & 4*

↕

Software Designer
SFIA *Level 3*

Skills Framework for the Information Age (SFIA)
Level 7 - Set strategy, inspire, mobilise
Level 6 - Initiate/influence
Level 5 - Ensure/advise
Level 4 - Enable
Level 3 - Apply
Level 2 - Assist
Level 1 - Follow

Commonly Used Tools/New Tech
- Software Development
- C++
- Java
- Linux
- React.js
- Docker Products
- Jenkins
- Machine Learning
- Design Patterns
- Stateless Architecture
- Kubernetes
- Spring Boot
- Responsive Web Design
- Containerisation

Job Description
- Responsible for problem-solving and planning for a software solution. After the purpose and specifications of software are determined, software developers will design or employ designers to develop a plan for a solution. It includes low-level component and algorithm implementation issues as well as the architectural view.
- Responsible for the documentation of the plan which is usually the product of the design.
- Software design documentation may be reviewed or presented to allow constraints, specifications and even requirements to be adjusted prior to programming. Redesign may occur after review of a programmed simulation or prototype. It is possible to design software in the process of programming, without a plan or requirement analysis, but for more complex projects this would not be considered a professional approach. A separate design prior to programming allows for multidisciplinary designers and Subject Matter Experts to collaborate with highly-skilled programmers for software that is both useful and technically sound.
- Works closely with the software developer to ensure that the design meets needs for the solution.
- Ensure the software is able to interact well with other applications that are currently in use.

Competencies
- Artistic talent and technical skills
- Communicate overall design and approach to programming team.
- Create flowcharts, diagrams, other models, and programming instructions to guide programming team.
- Analyse user and business requirements
- Networking skills and commitment to projects through previous work experience
- Collaborate with IT specialists, technicians - to deliver software solutions
- Translate user requirements into technical specifications
- Provide technical guidance on proposed solutions & alternatives
- Ability to recommend approaches that balance security, stability, and performance needs

Soft Skills
- Critical Thinking and Problem-solving
- Excellent organisational and time management skills
- Continuous Learning (Understand the latest trends and their role in a commercial environment)
- Communication & Teamwork skills
- Self-development (keep up to date with fast-changing trends)
- Agile Methodology and Design Thinking
- Business Analysis and User Research
- ArtSense, Creativity & Innovative
- Persuasive Skills
- Empathy

Essentials/Core Skills
- Agile Software Development
- Applications Development & Integration
- Business Needs Analysis
- Continuous Integration and Deployment
- Database Administration
- Emerging Technology Synthesis
- Project Management
- Security Architecture
- Software Design, Configuration & Testing
- Solution Architecture
- System Integration
- Test Planning
- User Interface Design

Common Certifications
- Strategyex Certificate (Associate or Master's) in Agile.
- BM Certified Database Administrator – DB2
- Microsoft SQL Server database certifications
- DataStax Professional Certification on Apache Cassandra
- Cloudera Certified Professional (CCP) Data Engineer
- Oracle Platform as a Service (PaaS) Certification
- Certified OpenStack Administrator
- Chef Certification
- HDP Certified Developer (HDPCD)
- Adobe Certified Associate: VFX & motion graphics using Adobe After Effects

APPLICATION DESIGNER

Career Pathway

Lead App Designer
SFIA *Level 5 & 6*

Senior App Designer
SFIA *Level 3 & 4*

Application Designer
SFIA *Level 3*

Skills Framework for the Information Age (SFIA)
Level 7 - Set strategy, inspire, mobilise
Level 6 - Initiate/influence
Level 5 - Ensure/advise
Level 4 - Enable
Level 3 - Apply
Level 2 - Assist
Level 1 - Follow

Commonly Used Tools/New Tech

- SQL
- HTML
- CSS
- Java
- Application-Specific Integrated Circuits (ASIC)
- Node.js
- Git
- Bootstrap
- AngularJS
- Web Programming
- UI Programming
- Database Designing

Job Description

- Responsible for directing, directing, and examining the quality and timeliness of other professional systems.
- Work on the most difficult or complicated system.
- Provide expertise in determining strategic technical direction and system architecture for initiatives.
- Creating and implementing the source code of new applications.
- Testing source code and debugging code.
- Evaluating existing applications and performing updates and modifications
- Propose solution based on client's requirements in developing application programming interfaces (APIs) to support web and mobile functionality.
- Keeping up to date with the terminology, concepts and best practices for coding for web and mobile. working closely with colleagues to constantly innovate app functionality and design

Competencies

- Understand business needs and user requirements
- Support the development of the applications concept, interface design, and architecture
- Support the development of program logic for new applications and features
- Drive to keep up to date with developments and trends in the tech and modern media world
- Integrate applications with back-end databases Support testing of the developed applications
- The ability to learn quickly
- The ability to interpret and follow technical plans

Soft Skills

- Agile Problem-Solving
- Business Acumen
- Critical & Analytical Skills
- Strong Communication
- Team building
- Time Management
- Self-development (keep up to date with fast-changing trends)
- Design Thinking

Essentials/Core Skills

- Applications Development
- Applications Integration
- Applications Support and Enhancement
- Problem Management
- Project Management
- Quality Standards
- Solution Architecture
- Strategy Planning
- System Integration
- Test Planning

Common Certifications

- IBM Certified Mobile Application Developer
- App Development Courses - edX
- Associate Android Developer (Google)
- GIAC Mobile Device Security Analyst (GIAC)
- MCSD: App Builder (Microsoft)
- MTA Developer (Microsoft)
- Salesforce Certified Platform App Builder
- Adobe Certified Associate: VFX & motion graphics using Adobe After Effects

SYSTEM SOFTWARE ANALYST

Career Pathway

Senior System Analyst

SFIA *Level 3 & 4*

System Analyst

SFIA *Level 3*

Skills Framework for the Information Age (SFIA)
Level 7 - Set strategy, inspire, mobilise
Level 6 - Initiate/influence
Level 5 - Ensure/advise
Level 4 - Enable
Level 3 - Apply
Level 2 - Assist
Level 1 - Follow

Commonly Used Tools/New Tech
- HTML
- SQL
- Java Script
- C#
- Python
- Software Development/ Software Engineering
- Storyboarding
- Flowcharting
- User Journey
- Informatics
- Node.js
- MongoDB
- Git

Job Description
- Implement, maintain, and support IT and informations systems to meet the business needs of organizations and scale as organizations grow.
- Analyze and create tests, and develop specifications and requirements for developers and programmers to follow.
- Also known as business technology analyst - usually not involved directly in software or hardware development.
- An information technology (IT) professional who specializes in analyzing, designing and implementing information systems.
- Assess the suitability of information systems in terms of their intended outcomes and liaise with end users, software vendors and programmers in order to achieve these outcomes.
- Uses analysis and design techniques to solve business problems using information technology.
- May serve as change agents who identify the organizational improvements needed, design systems to implement those changes, and train and motivate others to use the systems.

Competencies
- Strong computer, hardware, software, and analytical skills
- Proven ability to assess business needs and translate into relevant solutions
- Strong understanding and knowledge of the principles and practices associated with database maintenance and administration.
- Experience installing, configuring, documenting, testing, training, and implementing new applications and systems.
- Working knowledge of a wide variety of programming languages
- Strong problem-solving capacity
- High-level written and verbal communication skills
- Project management skills

Soft Skills
- Critical Thinking and Problem-solving
- Time management
- Communication & Teamwork
- Self-development
- Accuracy
- Agile Methodology
- Design Thinking
- Business Analysis
- Empathy
- Technical Writing

Essentials/Core Skills
- C, COBOL
- Software design, documentation, testing, and maintenance
- Hardware requirements
- Teamwork
- General consulting skills
- Software architecture

Common Certifications
- Certified Picture Archiving and Communicating System (PACS) Analyst Certification
- Microsoft Certified Solutions Associate (MCSA) Certification
- The Institute for Certification of Computing Professionals (ICCP) Information Systems Analyst Certification
- Agile Project Management Foundation Certification
- Architecting Software with OOAD & UML (ASOOAD)

DEVOPS ENGINEER

Career Pathway

Lead DevOps Engineer
SFIA *Level 4 & 5*

⇕

Senior DevOps Engineer
SFIA *Level 3 & 4*

⇕

DevOps Engineer
SFIA *Level 3*

Skills Framework for the Information Age (SFIA)
Level 7 - Set strategy, inspire, mobilise
Level 6 - Initiate/influence
Level 5 - Ensure/advise
Level 4 - Enable
Level 3 - Apply
Level 2 - Assist
Level 1 - Follow

Commonly Used Tools/New Tech

- Git and GitHub
- Linux
- Docker Products
- Jenkins
- Microsoft Azure
- Agile Methodology
- Robotic Process Automation (RPA)
- AWS CloudFormation
- Continuous Integration & Continuous Delivery (CI/CD)
- Elastic Stack (ELK)
- Kubernetes
- Nagios
- TensorFlow

Job Description

- Collaborate with software developers, system operators and other IT staff members to manage code releases.
- Cross and merge the barriers that exist between software development, testing and operations teams and keep existing networks in mind as they design, plan and test.
- Understands the Software Development Lifecycle and has the outright understanding of various automation tools for developing digital pipelines (CI/ CD pipelines).

Competencies

- Strong computer, hardware, software and analytical skills.
- Proven ability to assess business needs and translate into relevant solutions.
- Strong understanding and knowledge of the principles and practices associated with database maintenance and administration.
- Experience installing, configuring, documenting, testing, training, and implementing new applications and systems.
- Working knowledge of a wide variety of programming languages
- Strong problem-solving capacity
- High-level written and verbal communication skills
- Project management skills

Soft Skills

- Problem-solving
- Time management
- Critical Thinking
- Communication & Teamwork
- Self-development
- Accuracy
- Agile Methodology
- Design Thinking
- Business Analysis

Essentials/Core Skills

- Business Value Optimization
- Business Analysis
- Architecture & Design: Ensuring fit between developments and current situation, overall service design, patterns & styles.
- Programming: Software engineering mastery, everything as code, data management.
- Continuous Delivery: Automated testing, deployment and release management, configuration management, version control, cloud, containerization, feature-driven delivery.
- Test Specification: Design of test cases, test concepts.
- Infrastructure Engineering: Technical monitoring, performance management (e.g load balancing etc.), capacity and availability management, reliability engineering, cloud, containerization.
- Security, Risk & Compliance: Security, service continuity planning.

Common Certifications

- Docker Certified Associate
- Certified Kubernetes Administrator (CKA)
- Certified Kubernetes Application Developer (CKAD)
- AWS Certified DevOps Engineer Professional Exam
- Azure DevOps Solution Certification Exam
- Architecting With Google Cloud Platform
- Free DevOps Course (LinkedIn)
- Become a Cloud DevOps Engineer- Nano-degree Program- Udacity
- DevOps Training Course by Microsoft
- IBM® DevOps - Agile Software Development
- DevOps Foundation Certification