# Software Engineer Pathway KSB Map

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| Specialist Skills and Specialist Knowledge to be assessed | Achieved/Comments: |
| How to operate at all stages of the software development lifecycle. |  |
| How teams work effectively to develop software solutions embracing agile and other development approaches. |  |
| How to apply software analysis and design approaches. |  |
| How to interpret and implement a design, compliant with functional, non-functional and security requirements. |  |
| How to perform functional and unit testing. |  |
| How to use and apply the range of software tools used in Software engineering. |  |
| Create effective and secure software solutions using contemporary software development languages to deliver the full range of functional and non-functional requirements using relevant development methodologies. |  |
| Undertake analysis and design to create artefacts, such as use cases to produce robust software designs. | In accordance with Section 3.7 of the report, I demonstrate the ability to undertake analysis and design processes to create robust software designs. Specifically, I engage in use case analysis to develop comprehensive and structured artefacts. By thoroughly understanding the requirements and functionality of the software, I generate use cases that effectively capture user interactions and system behaviours. These use cases serve as valuable tools in the design phase, enabling the creation of software designs that are robust and aligned with user needs. Through the application of use case analysis, I ensure the development of high-quality software solutions that meet the desired objectives outlined in Section 3.7. |
| Produce high quality code with sound syntax in at least one language following best practices and standards. | As stated in Section 5.2 of the report, I possess the proficiency to produce high-quality code by adhering to best practices and standards. This includes following sound syntax guidelines in at least one programming language. By understanding and implementing coding standards mentioned in Section 5.2, I ensure that the code I write is clean, readable, and maintainable. Additionally, in accordance with Section 5.3, I utilize a layered architecture for .NET projects, which further enhances the quality of the codebase. This structured approach facilitates modular development, separation of concerns, and scalability, resulting in a well-organised and maintainable codebase. By incorporating these practices and standards outlined in Sections 5.2 and 5.3, I consistently deliver high-quality code that aligns with industry best practices. |
| Test code to ensure that the functional and non-functional requirements have been met. |  |
| Deliver software solutions using industry standard build processes, and tools for configuration management, version control and software build, release and deployment into enterprise environments. | In accordance with Section 5.4 of Chapter 5 in the report, I successfully achieved the delivery of software solutions using industry-standard build processes and tools. Specifically, I implemented the deployment and release pipelines discussed in Section 5.4, which involved leveraging Github Workflows for efficient software deployment. Furthermore, as mentioned in Section 4 of the report, I utilized Azure Kubernetes for seamless deployment and hosting of applications. Additionally, Section 3.15 highlights the effective utilization of Azure DevOps for task management and milestone tracking. By incorporating these tools and strategies outlined in the respective report sections, I ensured the delivery of software solutions in enterprise environments was carried out smoothly and efficiently. |
| Create effective and secure software solutions using contemporary software development languages to deliver the full range of functional and non-functional requirements using relevant development methodologies. |  |
| Undertake analysis and design to create artefacts, such as use cases to produce robust software designs. |  |
| Produce high quality code with sound syntax in at least one language following best practices and standards. |  |
| Perform code reviews, debugging and refactoring to improve code quality and efficiency. |  |

# Core Skills KSB Map

Use this section to demonstrate where you have achieved the core KSBs through your project. Where they have not met your project, add a comment as to why, and where you have met them.

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| Core Skills, Core Knowledge and Core Behaviours to be assessed | Achieved/Comments: |
| How business exploits technology solutions for competitive advantage. |  |
| The value of technology investments and how to formulate a business case for a new technology solution, including estimation of both costs and benefits. |  |
| Contemporary techniques for design, developing, testing, correcting, deploying and documenting software systems from specifications, using agreed standards and tools. |  |
| How teams work effectively to produce technology solutions. |  |
| The role of data management systems in managing organisational data and information. |  |
| Common vulnerabilities in computer networks including unsecure coding and unprotected networks. |  |
| The various roles, functions and activities related to technology solutions within an organisation. |  |
| How strategic decisions are made concerning acquiring technology solutions resources and capabilities including the ability to evaluate the different sourcing options. |  |
| How to deliver a technology solutions project accurately consistent with business needs. |  |
| The issues of quality, cost and time for projects, including contractual obligations and resource constraints. |  |
| Analyses business and technical requirements to select and specify appropriate technology solutions. Designs, implements, tests, and debugs software to meet requirements using contemporary methods including agile development. Manages the development and assurance of software artefacts applying secure development practises to ensure system resilience. Configures and deploys solutions to end users. |  |
| Follows a systematic methodology for initiating, planning, executing, controlling, and closing technology solutions projects. Applies industry standard processes, methods, techniques and tools to execute projects. Is able to manage a project (typically less than six months, no inter-dependency with other projects and no strategic impact) including identifying and resolving deviations and the management of problems and escalation processes. |  |
| Is able to critically analyse a business domain in order to identify the role of information systems, highlight issues and identify opportunities for improvement through evaluating information systems in relation to their intended purpose and effectiveness. |  |
| Identifies organisational information requirements and can model data solutions using conceptual data modelling techniques. Is able to implement a database solution using an industry standard database management system (DBMS). Can perform database administration tasks and is cognisant of the key concepts of data quality and data security. Is able to manage data effectively and undertake data analysis. |  |
| Can apply organisational theory, change management, marketing, strategic practice, human resource management and IT service management to technology solutions development. Develops well-reasoned investment proposals and provides business insights. |  |
| Can undertake a security risk assessment for a simple IT system and propose resolution advice. Can identify, analyse and evaluate security threats and hazards to planned and installed information systems or services (e.g. Cloud services). |  |
| Can plan, design and manage computer networks with an overall focus on the services and capabilities that network infrastructure solutions enable in an organisational context. Identifies network security risks and their resolution. |  |
| Fluent in written communications and able to articulate complex issues. |  |
| Makes concise, engaging and well-structured verbal presentations, arguments and explanations. |  |
| Able to deal with different, competing interests within and outside the organisation with excellent negotiation skills. |  |
| Is able to identify the preferences, motivations, strengths and limitations of other people and apply these insights to work more effectively with and to motivate others. |  |
| Competent in active listening and in leading, influencing and persuading others. |  |
| Able to give and receive feedback constructively and incorporate it into his/her own development and life-long learning. |  |
| Applies analytical and critical thinking skills to Technology Solutions development and to systematically analyse and apply structured problem solving techniques to complex systems and situations. |  |
| Able to put forward, demonstrate value and gain commitment to a moderately complex technology-oriented solution, demonstrating understanding of business need, using open questions and summarising skills and basic negotiating skills. |  |
| Able to conduct effective research, using literature and other media, into IT and business related topics. |  |
| Have demonstrated that they have mastered basic business disciplines, ethics and courtesies, demonstrating timeliness and focus when faced with distractions and the ability to complete tasks to a deadline with high quality. |  |
| Flexible attitude. |  |
| Ability to perform under pressure. |  |
| A thorough approach to work. |  |
| Logical thinking and creative approach to problem solving. |  |