Occupation Profile

Modern Apprenticeship in Digital Technology - Infrastructure at SCQF Level 6

Approved by: Digital Technology Technical Expert Group

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Purpose:

This occupation profile consists of 8 work situations routinely carried out in infrastructure roles. Collectively these describe all the performance requirements and knowledge and understanding requirements apprentices need to demonstrate competence in the occupation. Each work situation has a unique reference number and is set out as follows:

- Work situation title, goal, brief outline, performance requirements and knowledge and understanding requirements

Contents

Mandatory work situations

Work Situation

Applying problem solving approaches

Goal of work situation:
To select and apply tools and techniques to solve workplace problems in line with organisational procedures.

Brief outline:
This involves individuals identifying and exploring problems, selecting appropriate approaches, planning problem-solving steps, carrying out and assessing problem resolutions. This also includes documenting problems, resolutions and outcomes.

Performance requirements

1. Diagnosing problems to identify the key characteristics, who it affects, the impact and urgency to resolve it
2. Selecting and justifying the most appropriate problem-solving techniques in line with organisational procedures
3. Developing step-by-step plans to solve problems
4. Performing root cause analysis to identify underlying causes of problems and identify solutions
5. Evaluating potential solutions and selecting the most feasible
6. Implementing solutions to resolve problems
7. Assessing effectiveness of problem resolutions to contribute to continuous improvement activities
8. Documenting problems, approaches, steps taken, techniques applied and outcomes of the problem-solving activities to update knowledge bases

Knowledge and understanding requirements

1. What is meant by problem-solving
2. The importance of problem solving within an organisational context
3. How to diagnose problems to understand the main characteristics, impact, stakeholders and importance
4. Industry standard tools and techniques that can be applied to solving problems and how to apply them
5. How to plan problem solving steps
6. Steps involved in root cause analysis and how to apply them
7. How to evaluate solutions to problems and select the most appropriate
8. How to assess the effectiveness of problem-solving techniques and problem solutions
9. Impact on organisations of poor problem solving
10. How to document problems, problem solving approaches and resolutions
11. The importance of maintaining a knowledge base of problems and their resolutions

Work Situation

Producing documentation to support organisational process delivery

Goal of work situations:
To produce and update documentation for colleagues, customers and users to support the delivery of organisational processes.

Brief outline:
This is about individuals assessing documentation requirements, including audience, type of documentation and structure and format required. This also includes creating documents and associated graphics, identifying sources of information to include, maintaining version and revision control and checking documents meet requirements.

Performance requirements

1. Assessing documentation requirements to plan documentation production
2. Selecting structure and format of documentation in line with organisational style guides
3. Identifying sources of information for documentation to meet organisational requirements
4. Producing and updating documentation in line with organisational procedures
5. Applying version and revision control to document production in line with organisational procedures
6. Creating relevant graphics and visualisations within documentation to aid interpretation and illustrate key concepts
7. Reviewing documentation with stakeholders to ensure requirements are met
8. Following procedures for documentation sign off and storage in line with organisational procedures

Knowledge and understanding requirements

1. Who the stakeholders are for documentation
2. Purpose of the documentation being created
3. How to review documentation requirements
4. Steps involved in planning document production
5. Organisational structure and format style guides for standard documents including detailed and summary reports, plans, guidelines, standard operating procedures and project documentation
6. Industry standard conventions of format, structure and layout in documents and how to select and apply them
7. How to identify, locate and utilise information to include in documentation
8. Organisational policies and regulations for data protection and copyright that apply to documentation production
9. Industry standard tools and techniques used for document production and how to apply them
10. How to produce documentation
11. How to apply version and revision control to document production
12. How to create graphics and visualisations in documentation
13. Organisational procedures for testing and quality checking documentation
14. Organisational procedures for document sign off, version control, storage and distribution

Developing meta-skills and personal practice

Goal of work situation:
To develop meta-skills and personal practice through self-evaluation, agreeing objectives, reflecting on practice, and actively learning to improve own performance in line with organisational requirements.

Brief outline:
This is about developing meta-skills and personal practice. This involves reflecting on and learning from practice; acting on feedback; agreeing and working towards own objectives for continuous personal and professional development. Individuals will be supported in their development, usually by their line manager.

Performance requirements
1. Identifying meta-skills and role specific skills regularly used in own work to assess strengths and improvement needs for personal and professional development
2. Discussing and agreeing SMART objectives for personal and professional development and to achieve business objectives
3. Discussing and agreeing appropriate development activities to improve own performance and to achieve business objectives
4. Completing development activities within agreed timescales to support and progress own performance
5. Acting on feedback to improve own performance and development
6. Reflecting on performance, meta-skills and specific skills developed in your role to identify and agree future development needs
7. Completing mandatory training in line with organisational requirements
8. Completing documentation required for personal and professional development in line with organisation policy and procedures

Knowledge and understanding requirements
1. The purpose and importance of meta-skills including their definitions and how they relate to own work
2. The importance of personal and professional development within own organisation and role
3. How to use reflective practice to identify gaps in role specific knowledge, skills and meta-skills
4. How to participate effectively in performance reviews
5. How to discuss and agree SMART objectives – Specific, Measurable, Achievable, Realistic, Time-bound
6. The importance of business and personal objectives in own development
7. Sources of up-to-date and appropriate information to support own development
8. The importance of maintaining well-being in own role and where to get support
9. How to use feedback to develop own skills and knowledge
10. Different learning models and styles and how to use these for own development

Work Situation

Defining requirements to support project delivery

Goal of work situation:
To identify, understand and define stakeholder requirements for own projects to support project delivery.

Brief outline:
This is about individuals assessing requirements for projects they are tasked with delivering, through engaging with stakeholders to understand project goals and outcomes required. This includes defining and documenting requirements, identifying risks, producing estimates, developing plans and providing progress updates.

Performance requirements

1. Scheduling and attending project requirements meetings with stakeholders to gather project requirements
2. Reviewing project requirement specifications, plans and stakeholder feedback to specify own project tasks, deliverables and timescales
3. Undertaking estimation of own tasks and deliverables in line with organisational procedures
4. Producing task breakdown and project schedules to plan own project activities
5. Identifying key risks to own project to develop a risk assessment
6. Producing progress updates of own tasks to inform project monitoring

Knowledge and understanding requirements

1. Who the internal or external stakeholders are for a project
2. How to schedule and conduct stakeholder requirements meetings
3. How to engage with stakeholders and tailor communication styles
4. How to identify project requirements with stakeholders
5. How to interpret project requirement specifications and plans
6. SMART objectives (Specific, Measurable, Achievable, Realistic and Timebound) and how to apply them
7. Understanding the organisation's approach to managing projects and how this aligns to industry standard approaches
8. Steps involved in producing estimates for own project tasks
9. How to produce task breakdowns and schedules of own tasks and deliverables
10. Steps involved in identifying and assessing risks to own project activities
11. How to track and report own effort and progress on project tasks and outputs delivered
12. How to provide updates on projects and deliverables
13. The importance of developing excellent relationships with colleagues and stakeholders to support own project delivery

Work Situation

Contributing to implementing on-premises physical network infrastructure

Goal of work situation:
To contribute to configuring, installing and testing on-premises network operations.

Note: Individuals receive on-the-job training while working under close supervision as they gain experience, typically working on smaller tasks within larger projects.

Brief outline:
This is about individuals contributing to installing and testing network devices and services, to establish a physical network infrastructure. This includes implementing essential network security tools, validating network performance, setting access permissions, troubleshooting common network issues and producing network documentation.

Performance requirements

1. Contributing to installing and configuring industry standard network devices and services to provide scalable network operations
2. Contributing to implementing security tools on a network to prevent unauthorised access
3. Contributing to testing networks to validate network performance
4. Setting access permissions to control access to network resources
5. Contributing to troubleshooting common network issues to maintain network performance in line with service level agreements
6. Producing network documentation in line with organisational procedures

Knowledge and understanding requirements

1. Main uses of on-premises networks
2. The role of network operating systems in supporting multiple users
3. Industry standard network topologies
4. What is meant by software-defined networking (SDN)
5. Network layers, including transport, network, application and data
6. Industry standard network devices including routers, switches and firewalls, and how to install and configure them
7. Main network security fundamentals, including passwords, access control and management
8. The main purpose of firewalls in networks and how to configure them
9. Basic principles of network communications
10. How to set network access permissions for authorised users
11. Main industry standard network protocols including Transmission Control Protocol (TCP) and Internet Protocol (IP)
12. Main Internet services including Dynamic Host Configuration Protocol (DHCP), and Domain Name System (DNS)
13. Main factors affecting network performance
14. How to test network performance
15. Common network faults that can arise and how to resolve them
16. How to produce network documentation

Work Situation

Contributing to configuring and maintaining cloud infrastructure

Goal of work situation:
To implement, operate and maintain cloud services to provide organisational cloud infrastructure operations.

Note: Individuals receive on-the-job training while working under close supervision as they gain experience, typically working on smaller tasks within larger projects.

Brief outline:
This is about individuals contributing to building and deploying cloud infrastructure using public, private or hybrid cloud deployment configurations and automating cloud services. This includes deploying cloud solutions, monitoring cloud performance and security, maintaining cloud software, troubleshooting cloud issues and documenting cloud processes.

Performance requirements

1. Contributing to building and deploying cloud services to provide cloud infrastructure solutions
2. Contributing to automating cloud processes in line with organisational procedures
3. Contributing to security monitoring of cloud infrastructure to maintain security compliance
4. Contributing to monitoring cloud environments to maintain required levels of performance and availability
5. Contributing to cloud software updates to maintain ongoing cloud performance
6. Contributing to troubleshooting problems with cloud infrastructure to support their resolution and maintain cloud service performance
7. Documenting cloud process in line with organisational standards

Knowledge and understanding requirements

1. Main uses and business case for cloud computing
2. Fundamental principles of cloud network operations
3. Industry standard service models of cloud computing including IaC (infrastructure as code), IaaS (Infrastructure as a service), PaaS (platform as a service), SaaS (software as a service)
4. Different cloud deployment models including public, private and hybrid
5. Virtualisation technologies and how they are used in cloud computing.
6. Various components of cloud architecture (including virtualisation, virtual machines, containerisation, and cloud security)
7. How to implement cloud services
8. How to configure virtual machines for building and deploying apps to the cloud
9. Software and processes required to automate cloud services and how to implement them
10. Industry standard cloud storage solutions
11. Main security issues in cloud environments and how to mitigate them
12. How to perform cloud software updates
13. Main factors affecting cloud network performance
14. How to troubleshoot cloud infrastructure issues
15. How to produce documentation of cloud processes

Optional work situations

A minimum of <u>one</u> optional work situation must be achieved

Work Situation

Assisting with implementing wireless network infrastructure

Goal of work situation:
To assist with implementing and testing wireless networking infrastructure to provide wireless networking operations.

Note: Individuals receive on-the-job training while working under close supervision as they gain experience, typically working on smaller tasks within larger projects.

Brief outline:
This is about individuals assisting with wireless network implementation and operations. This includes identifying requirements, installing, configuring and testing wireless network access points and making wireless connections secure. This also includes configuring endpoint devices to connect to wireless infrastructure, resolving issues with wireless networks and documenting wireless network installations.

Performance requirements

1. Assisting with identifying requirements for wireless access services to plan wireless network installation
2. Assisting with installing and configuring wireless access points in line with organisational procedures
3. Activating wireless isolation settings to secure wireless networks
4. Assisting with testing wireless access points to confirm a secure wireless connection
5. Configuring and connecting client devices to networks in line with organisational procedures
6. Assisting with identifying and resolving wireless network issues to maintain network performance
7. Documenting wireless network installation, testing and problem resolution activities in line with organisational requirements

Knowledge and understanding requirements

1. Fundamental concepts of wireless networks
2. Main uses of wireless on-premises networks
3. Common industry standard wireless network topologies
4. Network protocols and their application for wireless networks, including Transmission Control Protocol (TCP) and Internet Protocol (IP).
5. How to install and configure a wireless access point
6. How to implement wireless network services
7. How to secure a wireless network using wireless isolation
8. How to test a wireless access point and verify wireless connection
9. How to connect client devices to wireless networks
10. Wireless networking standards and their main characteristics
11. Main factors affecting wireless network performance and how to resolve them
12. How to document wireless network installations

Work Situation

Supporting cloud migration

Goal of work situation:
To support cloud migrations to current cloud environments from on-premises and existing cloud deployments.

Note: Individuals receive on-the-job training while working under close supervision as they gain experience, typically working on smaller tasks within larger projects.

Brief outline:
This is about individuals supporting cloud infrastructure migration. This includes supporting planning migration of data, applications and services, implementing automation and monitoring and resolving issues in cloud migration. It also includes monitoring cloud activity and documenting cloud migrations.

Performance requirements

1. Supporting cloud migration planning and scheduling in line with organisational requirements
2. Supporting migrations of applications, data and services between clouds or from on-premises to current cloud environments in line with organisational procedures
3. Supporting post-migration testing to assess availability and performance of migrated applications, data and services
4. Supporting cloud migration automation to improve cloud deployment performance
5. Supporting reviewing log files to monitor cloud user activity and protect against potential security threats
6. Supporting cloud infrastructure migration troubleshooting to resolve cloud infrastructure performance issues
7. Supporting with monitoring of cloud services performance metrics in line with organisational procedures
8. Documenting cloud migration activities in line with organisational procedures

Knowledge and understanding requirements

1. Benefits, business and environmental case of cloud migration
2. Industry standard cloud billing models and their key features
3. How to plan cloud migrations
4. Risks of cloud migration
5. Roles, responsibilities and contractual obligations when migrating to cloud
6. Steps involved in migrating data and applications and how to apply them
7. How cloud infrastructure increases complexity, spanning client-server, virtualised, serverless and hybrid cloud platforms involving containers and microservices
8. Industry standard migration tools and techniques and how to apply them
9. How to perform cloud migration from physical on-premises infrastructure or existing cloud infrastructure deployments
10. Industry standard cloud migration frameworks and strategies for organising cloud migration
11. How to test cloud migrations
12. How to automate cloud migration processes

13. Access and security requirements relating to migrating data and applications to the cloud
14. Data protection and governance and how to maintain security of data within cloud infrastructure
15. Steps involved in monitoring log files to validate user activity
16. Common issues that can arise in cloud migration and how to resolve them
17. How to monitor cloud infrastructure performance using industry standard tools
18. How to produce cloud migration and maintenance documentation

The relationship between meta-skills and work situations

Work situation	Meta skills alignment											
	Adapting	Collaborating	Communicating	Creativity	Critical thinking	Curiosity	Feeling	Focussing	Initiative	Integrity	Leading	Sense making
Applying problem solving approaches	✓		✓	✓	✓	✓	✓		✓	✓		✓
Producing documentation to support organisational process delivery	✓	✓	✓	✓		✓	✓	✓	✓	✓		✓
Developing meta-skills and personal practice	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Defining requirements to support project delivery	✓	✓	✓		✓	✓	✓	✓		✓		✓
Contributing to implementing on-premises physical network infrastructure	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓
Contributing to configuring and maintaining cloud infrastructure	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓
Assisting with implementing wireless network infrastructure	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓
Supporting cloud migration	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓

The table above indicates where there are opportunities to develop and evidence meta-skills in each work situation within the occupation profile. Please note, this information is for guidance, and indicates where meta-skills are explicit rather than an exhaustive list. There may be opportunities for individuals to develop and evidence other meta-skills when carrying out their role.

The relationship between National Occupational Standards and work situations

The table below indicates where there are links between National Occupational Standards and each work situation within the occupation profile

Work situation	National Occupational Standards Alignment
Applying problem solving approaches	ESKITP7034 Problem Management TECHDUPS1 Recognise and resolve routine digital technology problems
Producing documentation to support organisational process delivery	ECHDUWP1 Create and edit digital documents
Developing meta-skills and personal practice	CFABAA626 Plan how to manage and improve own performance in a business environment
Defining requirements to support project delivery	TECDT20341 Undertake system requirements elicitation and definition TECDT20351 Manage system requirements engineering
Contributing to implementing on-premises physical network infrastructure	ESKITP903301 Installation, Implementation and Handover of Network Infrastructure Services
Contributing to configuring and maintaining cloud infrastructure	TECIS40943 Design and implement cloud-based data storage solutions TECIS40944 Optimise performance of cloud services
Assisting with implementing wireless network infrastructure	TECHDUDD1 Setup and use digital devices TECIS1101303 Configure digital telecommunications equipment and establish broadband connectivity
Supporting cloud migration	TECIS40931 Implement cloud migration solutions