



Institute for Apprenticeships  
& Technical Education

# DIGITAL AND TECHNOLOGY SOLUTIONS PROFESSIONAL

## Key information

**Reference:** ST0119

**Version:** 1.2

**Level:** 6

**Degree:** integrated degree

**Typical duration to gateway:** 48 months

**Typical EPA period:** 3 months

**Maximum funding:** £27000

**Route:** Digital

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**Approved for delivery:** 26 March 2015

**Lars code:** 25

**EQA provider:** Office for Students

**Review:** This apprenticeship standard will be reviewed after three years

This apprenticeship has options. This document is currently showing the following option:

All



## Details of the occupational standard

### Occupation summary

This occupation is found in organisations where digital technologies can be used to solve problems that exist across a range of functions. Whether looking for ways to reduce waste, increase productivity, ensure resilient and responsive customer service, or create a secure transactional environment, organisations turn to digital and technological solutions to achieve these aims. Wherever these activities take place Digital and Technology Solutions Professionals (DTSPs) are influencing outcomes and making things happen.

DTSPs are found in small, medium and large organisations across all industries such as banking and finance, digital and technology, communications, construction, education, utilities, engineering, law, manufacturing, health, government and public services pharmaceutical, retail and transport.

The broad purpose of the occupation is to evaluate, initiate, create and support business solutions using digital technology. DTSPs use data to evaluate the commercial and security risks and benefits of potential digital and technology solutions before making recommendations for strategies that may have far reaching consequences.

DTSPs are influencers in their organisations with a clear focus on delivering business improvements through digital and technological solutions. They have a passion for digital technology; keeping in touch with emerging trends and developments .

DTSPs have a broad set of skills and knowledge across the main areas of the digital and technology landscape. This enables them to understand the complexity of information systems, systems development, data, cyber security, business organisation, IT project management and computer and network infrastructures. They view all of this with a rigorous approach to commerciality and budget to deliver quality solutions.

In addition to this broad set of skills and knowledge they specialise in one of the following areas:

- Option 1: Software Engineer
- Option 2: IT Consultant
- Option 3: Business Analyst
- Option 4: Cyber Security Analyst
- Option 5: Data Analyst
- Option 6: Network Engineer

For example:

- In a manufacturing company DTSP Software Engineers could be developing solutions to support the construction of physical products.
- In a utility company DTSP IT Consultants could be on a remote site to implement a solution for improving energy usage or reducing outages through the application of new technologies.
- In an engineering company DTSP Business Analysts could be reviewing a change to an engineering process to determine the impact on other processes within the organisation.
- In a technology company DTSP Cyber Security Analysts could be working with clients to address security management issues in the clients' processes.
- In a pharmaceutical company DTSP Data Analysts could be working with large amounts of information to interpret the results of a field trial of a new medicine.

In a communications company DTSP Network Engineers could be involved in developing additions to an existing national network.

In their daily work DTSPs are excellent communicators and may interact with internal and external customers, team members and senior leaders. They can work independently and within multi-disciplinary teams. They may interact with decision-makers, strategists, and policymakers, often in senior roles in private or public sector organisations as well as with individuals and groups (internal and external) with a stake in the defined system, currently or in the future.

An employee in this occupation is likely to have some responsibility for budgets and/or resources, teams, and projects. In some organisations they may hold leadership positions. Work may typically be conducted in a desk-based environment, but that desk may be in an office or on a site depending on the solution being worked upon.

For example, a DTSP Software Engineer could be working on a client's site during the development and implementation of a new client system.

An employee in this occupation will be responsible for working with little or no supervision and may be accountable for the supervision of others if the position requires it.

DTSPs are at the heart of problem solving, bringing an innovative, multi-disciplined approach to bear where there are unpredictable and variable influencing factors. They may have a remit to commission work from others and hold them accountable for outputs of a technical nature. Their professional position within a business means they fulfil a leadership role within their technical specialism demonstrating a strong ethical awareness of technological trends.

A description of each specialism follows:

#### Option 1) Software Engineer

The primary role of the Software Engineer is to undertake all requirements during the solution development life-cycle from gathering requirements to analysis, design, code, build, test, implementation and support. They may also be required to supervise the work of junior software developers and others who may be working on elements of the solution and work with product managers and UX designers in implementing solutions. They will apply software engineering principles to all stages of the solution life-cycle, from gathering requirements, undertaking analysis and design, development of code and data requirements whilst also ensuring security features are addressed. As well as creating new code, they can support existing code by troubleshooting, reverse engineering and conducting root cause analysis. They typically work as part of a large collaborative team and will have responsibility for significant elements of software solutions.

#### Option 2) IT Consultant

An IT consultant bridges the gap between users and technology: they reinvent the digital world of the future. They require a broad set of skills in business analysis, solutions development, network infrastructure, data, cyber security etc. They use their consulting skills to get to the root of a problem and advise clients, both externally and internally, on how to best utilise technology to meet their business objectives, overcome problems and increase productivity. They provide strategic guidance and training to clients, both externally and internally, about digital and technology solutions. They facilitate changing business processes, improved structure, and efficiency through enhancements to digital and technology solutions. They design, build and install innovative customer experiences using the latest technologies to win business for their organisation.

#### Option 3) Business Analyst

A business analyst is an interpreter between two worlds: business and IT, bridging the gap of understanding between business and technology teams. They analyse and understand business needs and define and manage business requirements. They oversee design and delivery of tested system solutions throughout a project life-cycle to ensure these meet business requirements. They are key communicators and drivers of collaboration throughout the development life cycle. They are focused on the customer and work closely with the IT delivery team. They are essential in the development of successful digital and technology solutions through their rigorous analysis of business requirements to inform their recommendations and insight.

#### Option 4) Cyber Security Analyst

A Cyber Security Analyst leads in the work to define, implement and maintain security products and systems within an organisation's policies and service level agreements. They will need to analyse and understand the points of vulnerability within IT systems and a proactive and agile approach to maintain high levels of systems and organisational security. They will monitor security performance using tools, statistical reporting and analysis, using the output of monitoring to problem solve, propose improvements and implement changes to meet service level requirements. A Cyber Security Analyst leads technical implementation of security infrastructures and technical designs, including producing cost and timescale estimates and identifying risks. After implementation they take ownership for obtaining the information required to diagnose and resolve more complex problems and escalations such as security incidents and business recovery. They engage with third parties to jointly resolve in-depth product issues where necessary and completing cyber risk assessments.

#### Option 5) Data Analyst

The primary role of a data analyst is to collect, organise and study data to provide new business insight to a range of stakeholders. They are responsible for leading the provision of up-to-date, accurate and relevant data analysis for the organisation. They are typically involved with managing, cleansing, abstracting and aggregating data across the network infrastructure. They look for opportunities to build data driven insights into decision making. They have a current understanding of data structures, software development procedures and the range of analytical tools used to undertake a wide range of standard and custom analytical studies, providing data solutions to a range of business issues. They are comfortable supporting teams and colleagues with analytics and report the results of data analysis activities making recommendations to improve business performance.

#### Option 6) Network Engineer

The primary role of a network engineer is to lead in the planning, design, installation, maintenance and support of communication networks within an organisation or between organisations. They take a proactive and agile approach to maintain high levels of network performance and availability for their users, such as staff, clients, customers and suppliers. They understand network configuration, cloud, network administration and monitoring tools, and give technical advice and guidance to their users. As part of their role they analyse system requirements to ensure the network and its services operate to desired levels with security at the heart of everything they do. They understand data traffic and transmission across the network and have a major role to play in ensuring network security and resilience. They are the key problem solver when networks fail and respond with resilience under pressure.

### Typical job titles include:

Business analyst

Computing data analyst

Cyber security professional

It consultant

Network engineer

Software engineer

### Core occupation duties

DUTY	KSBS
<b>Duty 1</b> Critically analyse a business domain to identify opportunities for improvement	K1 K2 K3 K5 K7 K8 K10 K11 K12 K13 K14 K15 K16 K19 K20  S1 S2 S5 S9 S11 S12 S13 S14 S15  B1 B2 B3 B4 B6
<b>Duty 2</b> Analyse business and technical requirements to select and specify appropriate technology solutions.	K1 K2 K3 K5 K10 K11 K12 K14 K16 K17 K20  S1 S2 S3 S7 S9 S10 S13 S15  B1 B2 B3 B4 B6 B8
<b>Duty 3</b> Identify organisational information requirements and model data solutions using conceptual data modelling techniques	K1 K2 K3 K4 K5 K7 K8 K9 K11 K12 K13 K14 K15 K16 K19 K20  S1 S2 S5 S8 S9 S11 S13 S14 S15  B1 B2 B3 B6 B7 B8
<b>Duty 4</b> undertake a security risk assessment for a simple IT system to identify, analyse and evaluate security threats and hazards to planned and installed information systems or services (e.g. Cloud services) and provide recommendations.	K1 K2 K3 K4 K6 K9 K11 K12 K13 K14 K15 K16 K17 K19 K20  S1 S2 S3 S5 S6 S9 S12 S13 S15  B1 B2 B3 B5 B6 B8
<b>Duty 5</b> apply organisational theory, change management, marketing, strategic practice, human resource management and IT service management to technology solutions development.	K4 K7 K8 K12 K14 K15  S2 S8 S9 S10  B1 B2 B3 B5 B6 B7 B8
<b>Duty 6</b> follow a systematic methodology for initiating, planning, executing, controlling, and closing technology solutions projects using industry standard processes, methods, techniques and tools to execute and manage projects.	K1 K2 K3 K4 K8 K9 K10 K14 K15 K16 K19 K20  S1 S2 S3  B1 B2 B3 B4 B8
<b>Duty 7</b> 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.	K1 K2 K3 K4 K5 K7 K8 K10 K11 K12 K13 K14 K15 K16 K19 K20  S12 S13 S14 S15  B1 B2 B3 B4 B6 B7 B8

**Duty 8** communicate effectively with a range of stakeholders both technical and non-technical at all levels of influence and responsibility.

K1 K3 K5 K11 K12 K14 K15 K16 K19  
K20

S1 S2

B1 B2 B3 B4 B5 B6 B7 B8

**Duty 9** devise and engage in continuous professional development

K2 K3 K5 K8 K9 K10 K12 K14 K15  
K16 K17

S1 S2 S12

B1 B2 B3 B5 B6 B7 B8

**Duty 10** conduct and present effective research using engaging, well-structured approaches

K6 K17 K18

S7 S10

B1 B2 B3 B6

**Duty 11** design, build and test high-quality software solutions.

K3 K4 K6 K7 K10 K12

S2 S4 S5 S9

B1 B2 B3 B4 B6

**Duty 12** apply engineering principles to all stages of the software development process, from requirements, analysis and design, development and data requirements

K4 K8 K14 K15 K16 K19 K20

B5 B7 B8

**Duty 13** Apply skills and knowledge of systems development, cyber security, data, AI and infrastructure in the creation of digital solutions.

K1 K4 K5 K6 K7 K12 K14 K15 K16  
K17 K18 K19 K20

S1 S2 S5 S9 S11 S14

B1 B2 B3 B4 B6 B7 B8

**Duty 14** Analyse ethical and legal implications of digital and technology solutions and make recommendations as a result of this analysis. For example, with regard to artificial intelligence or the use of personal data.

K1 K6 K14 K15 K16 K17 K18 K20

S1 S2 S5 S10 S11 S15

B1 B2 B3 B6

**Duty 15** Mentor others in the development and implementation of digital and technical solutions.

K2 K3 K4 K5 K10 K11 K12

B4 B5 B6 B7 B8

## Option duties

## **software engineering professional duties**

DUTY	KSBS
<p><b>Duty 16</b> Accountable for the undertaking and completion of the analysis of software engineering business issues for either the entire requirement or subset thereof dependent on complexity and/or scope size.</p>	<p>K21 K22 K23 K28 S16 S23</p>
<p><b>Duty 17</b> Implement the software solution, or part thereof, dependent on complexity, scope size and technology (including bespoke code, implementation of COTS package, or tailoring of package, or combinations of these) into the environment required (including systems test, user test environment, or live environment as appropriate).</p>	<p>K21 K22 K23 K24 K28 S19 S20</p>
<p><b>Duty 18</b> Creation of an over-arching software solution design suitable to resolving the business issues for either the entire requirement or subset thereof dependent on complexity and/or scope size.</p>	<p>K24 K26 K27 K28 S17 S18 S19</p>
<p><b>Duty 19</b> Build the software solution, or part thereof, dependent on complexity, scope size, and technology (including bespoke code, implementation of COTS (Commercial-off-the-shelf) package, or tailoring of package, or combinations of these).</p>	<p>K21 K22 K23 K24 K25 K26 K27 K28 S18 S19 S20 S21</p>
<p><b>Duty 20</b> Supervise the work of more junior team members undertaking work in the software solution life-cycle</p>	<p>K21 K28 S16 S17 S22</p>
<p><b>Duty 21</b> Test that the software solution, or part thereof, dependent on complexity, scope size and technology (including bespoke code, implementation of COTS package, or tailoring of package, or combinations of these) meets the business needs identifying any remedial actions required</p>	<p>K25 K26 K28 S16 S18 S21 S22 S23</p>
<p><b>Duty 22</b> Work closely with all key stakeholders to ensure the software solution or part thereof, dependent on complexity and scope size, is understood and correctly used.</p>	<p>K21 K28 S17 S22</p>
<p><b>Duty 23</b> Ongoing support of the software solution or part thereof, dependent on complexity and technology (including bespoke code, implementation of COTS</p>	<p>K21 K28 S22 S23</p>

package, or tailoring of package or combinations of these).

## **IT consultant professional duties**

DUTY	KSBS
<b>Duty 24</b> Perform internal and external client interviews to identify short and long term digital and technology business goals.	K29 K30 K35 K36 S28 S29
<b>Duty 25</b> Perform gap analysis against current industry best practices.	K30 K34 S24 S26
<b>Duty 26</b> Distinguish, analyse and document digital and technology requirements and manage those requirements through a project life cycle.	K30 K31 K34 S24 S26 S28 S29 S30
<b>Duty 27</b> Use a range of methodologies, techniques and work products to produce digital and technology solutions for internal and external clients.	K30 K34 K35 S24 S26
<b>Duty 28</b> Generate, develop and win new digital and technology business.	K33 K36 S24 S25 S26
<b>Duty 29</b> Create and use intellectual capital to solve diverse technology and digital business issues in innovative ways.	K32 K33 K34 S28 S29 S30 S31
<b>Duty 30</b> Design, test, install and monitor new systems and processes.	K33 K34 K35 K36 S24 S25 S26 S27 S28 S29 S30 S31
<b>Duty 31</b> Devise and deliver training for users and other consultants.	K31 K32 K33 S25 S27
<b>Duty 32</b> Manage walk-throughs to identify, document and manage key technical risks within an internal or external client's organisation.	K31 K32 S27
<b>Duty 33</b> Analyse an internal/external client's IT environment to determine requirements and recommend technology and digital solutions to address their business problems and needs.	K32 K33 K34 K35 K36 K44 S24 S25 S26

## business analyst professional duties

DUTY	KSBS
<b>Duty 34</b> Analyse an internal or external client's business processes and recommend digital or process solutions to address their business problems and needs.	K37 K38 K39 K40 K43 S32 S33
<b>Duty 35</b> Distinguish, analyse and document business requirements and manage those requirements through a project life cycle.	K38 K39 S32 S36
<b>Duty 36</b> Analyse data and be responsible for logical data models to create suggestions for strategic and operational improvements and changes.	K39 K40 K43 S33 S35 S36
<b>Duty 37</b> Design the user interface and propose and produce prototypes, including the look and feel of the graphical design and navigational elements.	K40 K41 K44 S33 S36 S37 S38 S39
<b>Duty 38</b> Formulate and interpret business requirements into System Functional requirements, developing proposed solution designs including architecture.	K38 K43 K44 S32 S35 S38
<b>Duty 39</b> Develop business test scenarios and test cases for verifying that the "right system is built", to meet the organisation's requirements.	K38 K41 K42 K43 S34 S36 S37 S38
<b>Duty 40</b> Produce written documentation to support work, report findings and present to stakeholders.	K38 K41 K44 S32 S35 S38 S39

## cyber security professional duties

DUTY	KSBS
<b>Duty 41</b> Analyse and evaluate security threats to technology solutions and implement technical and process solutions to mitigate these threats.	K45 K46 K47 K49 K51 S40 S41 S43 S46
<b>Duty 42</b> Perform security risk assessments within wider IT development teams, ensuring cyber security is embedded within the deliverables of the team.	K46 K47 S41
<b>Duty 43</b> Lead a range of cyber security audit activities to demonstrate security control effectiveness.	K47 K48 K50 S42 S46
<b>Duty 44</b> Apply advanced problem solving techniques to address cyber security issues.	K45 K48 K49 K50 K52 S40 S44 S46 S47
<b>Duty 45</b> Plan and perform a business impact analysis in response to a security incident and implement a recovery plan.	K49 K51 K52 S40 S43 S44
<b>Duty 46</b> Demonstrate effective management of cyber security processes and systems within the defined Service Level Agreements (SLAs).	K46 K48 K49 K50 K51 K52 S43 S45 S46 S47

## computing data analyst professional duties

DUTY	KSBS
<b>Duty 47</b> Analytic support for colleagues	K53 K55 K58 K59 S49 S50 S51
<b>Duty 48</b> Support the analytics strategy and measurement for specific teams across the business	K53 K54 K55 K57 K58 K59 S48 S49 S50 S51
<b>Duty 49</b> Deliver insights, analysis, data and measurement that help the business achieve its objectives	K54 K55 K56 K57 K58 K59 K60 S48 S50 S51 S52 S53 S54 S55
<b>Duty 50</b> Work with other stakeholders in order to understand their requirements	K53 K55 K56 K57 K58 K59 K60 S49 S50 S51 S55
<b>Duty 51</b> Keep up to date with the latest developments within the field of data analytics	K53 K55 K56 K58 K59 K60 S48 S49 S51 S52 S54

## network engineering professional duties

DUTY	KSBS
<b>Duty 52</b> Analyse a network system and make recommendations to optimise performance and efficiencies of network systems.	K62 K64 K66 S56 S59 S60
<b>Duty 53</b> Design operational networks and apply appropriate security products and processes in line with organisational requirements.	K61 K63 K64 K66 K67 S56 S62
<b>Duty 54</b> Plan system upgrades to a network or hardware or software or operating systems.	K61 K63 K64 K65 K66 K67 K68 S57 S58 S59 S60 S61 S62 S63
<b>Duty 55</b> Produce relevant network information or documentation to meet user needs.	K64 K66 S57 S58 S61 S62 S63
<b>Duty 56</b> Maintain accurate logical records in line with organisational policy and when carrying out network tasks and identify when network updates are required.	S56 S57 S58 S59 S61 S63
<b>Duty 57</b> Interpret requirements and technical specifications in relation to network systems.	K61 K63 K64 K66 K67 K68 S57 S60 S61 S62
<b>Duty 58</b> Escalate network security or resilience risk as appropriate, providing solution/s to identified risk area.	K61 K64 K65 K66 S58 S59 S60 S61 S63
<b>Duty 59</b> Problem solve to address technical performance issues in network systems.	K61 K64 K65 K66 S59 S60 S61 S62 S63

## KSBs

### Knowledge

**K1:** How organisations adapt and exploit digital technology solutions to gain a competitive advantage.

**K2:** The principles of strategic decision making concerning the acquisition or development of digital and technology solutions. For example business architecture approaches such as capability models and target operating models.

**K3:** Principles of estimating the risks and opportunities of digital and technology solutions.

- K4:** Techniques and approaches involved in creating a business case for new digital and technology solutions. For example journey, product and capability mapping and value chains.
- K5:** A range of digital technology solution development techniques and tools.
- K6:** The approaches and techniques used throughout the digital and technology solution lifecycle and their applicability to an organisation's standards and pre-existing tools.
- K7:** The roles, functions and activities within digital technology solutions within an organisation.
- K8:** How teams work effectively to produce digital and technology solutions.
- K9:** The concepts and principles of leadership.
- K10:** Management techniques and theories. For example, effective decision making, delegation and planning methods, time management and change management.
- K11:** The nature and scope of common vulnerabilities in digital and technology solutions. For example, the risks of unsecure coding and unprotected networks.
- K12:** The role of data management systems within Digital and Technology Solutions.
- K13:** Principles of data analysis for digital and technology solutions.
- K14:** A range of quantitative and qualitative data gathering methods and how to appraise and select the appropriate method.
- K15:** Principles of estimating cost, and time resource constraints within digital and technology solutions activities.
- K16:** Fundamental computer networking concepts in relation to digital and technology solutions. For example, structure, cloud architecture, components, quality of service.
- K17:** Reporting techniques, including how to synthesise information and present concisely, as appropriate to the target audience.
- K18:** Techniques of robust research and evaluation for the justification of digital and technology solutions.
- K19:** Relevant legal, ethical, social and professional standards to a digital and technology solution. For example, Diversity, Accessibility, Intellectual Property, Data Protection Acts, Codes of Practice, Regulatory and Compliance frameworks.
- K20:** Sustainable development approaches as applied to digital and technology solutions such as green computing.
- K21:** How to operate at all stages of the software development life cycle and how each stage is applied in a range of contexts. For example, requirements analysis, design, development, testing, implementation.
- K22:** Principles of a range of development techniques, for each stage of the software development cycle that produce artefacts and the contexts in which they can be applied. For example UML, unit testing, programming, debugging, frameworks, architectures.

- K23:** Principles of a range of development methods and approaches and the contexts in which they can be applied. For example Scrum, Extreme Programming, Waterfall, Prince2, TDD.
- K24:** How to interpret and implement a design, compliant with functional, non-functional and security requirements including principles and approaches to addressing legacy software development issues from a technical and socio-technical perspective. For example architectures, languages, operating systems, hardware, business change.
- K25:** The factors affecting product quality and approaches for how to control them throughout the development process. For example security, code quality, coding standards.
- K26:** How to select and apply a range of software tools used in Software Engineering.
- K27:** Approaches to the interpretation and use of artefacts. For example UML, unit tests, architecture.
- K28:** Approaches to effective team work and the range of software development tools supporting effective teamwork. For example, configuration management, version control and release management.
- K29:** Principles of different consulting methodologies. For example issue-based, and hypothesis based.
- K30:** How consulting interfaces with project management, business analysis and business management.
- K31:** Principles of change management within organisations.
- K32:** The barriers to solving digital and technology problems or maximising opportunities.
- K33:** Approaches to presenting recommendations to stakeholders and influencing action.
- K34:** Approaches to analytical and critical thinking to define business problems objectively and create value for the client.
- K35:** Questioning strategies and active listening to ensure all requirements are gathered.
- K36:** The ethical and legal requirements in client and provider relationships.
- K37:** Elicitation and Collaboration approaches, including how to prepare for and conduct elicitation activities and confirm the results.
- K38:** Approaches to Requirements Life Cycle Management including how to manage and maintain requirements and design information from inception to retirement of a product.
- K39:** Principles of Strategy Analysis, including how to identify the business need, address that need, and align the change strategy within the organisation.
- K40:** Solution Evaluation, including how to assess the performance of and value delivered by a solution and to recommend improvements on increasing values.
- K41:** Legislation and industry standards relevant to Business Analysis in the organisation and sector.

**K42:** The purpose and value of quality assurance techniques.

**K43:** A range of Business Analysis investigative techniques.

**K44:** Approaches to change control and requirements management.

**K45:** Principles of cyber security tools and techniques.

**K46:** Principles of quantitative and qualitative risk management theory including the role of risk stakeholders.

**K47:** Concepts and approaches to cyber security assurance.

**K48:** Key legislative frameworks and the regulatory landscape for cyber security including Data Protection Act 2018 , Network Information System Directive 2018, Regulation of Investigatory Powers Act 2000, ISO 27001.

**K49:** Approaches to incident response and management including escalation and investigation of cyber security breaches and their root cause.

**K50:** Ethical principles and codes of good practice of at least one significant cyber security professional body and the ethical responsibilities of a cyber security professional.

**K51:** Principles of common security architectures and methodologies.

**K52:** Approaches to deployment of cyber security technology components in digital systems to provide security functionality. For example hardware and software to implement security controls.

**K53:** The barriers that exist to effective data analysis between analysts and their stakeholders and how to avoid or resolve these.

**K54:** How to critically analyse, interpret and evaluate complex information from diverse datasets.

**K55:** Data formats, structures, architectures and data delivery methods including “unstructured” data.

**K56:** Sources of data such as files, operational systems, databases, web services, open data, government data, news and social media.

**K57:** Approaches to data processing and storage, database systems, data warehousing and online analytical processing, data-driven decision making and the good use of evidence and analytics in making choices and decisions.

**K58:** How Data Analytics operates within the context of data governance, data security, and communications.

**K59:** How Data Analytics can be applied to improve an organisation’s processes, operations and outputs.

**K60:** How data and analysis may exhibit biases and prejudice. How ethics and compliance affect Data Analytics work, and the impact of international regulations. For example, General Data Protection Regulation, Data Protection Act 2018.

**K61:** The role and function of virtual or physical network components and functions and typical topologies and service architectures.

**K62:** The main network protocols in use, their purpose, features and relationship to each other. For example, Ethernet, IP (Internet Protocol), TCP (Transmission Control Protocol), OSPF (Open Shortest Path First).

**K63:** The benefits and risks of cloud computing and the common integration deployments (private, public, hybrid). Including the benefits and risks of virtualisation as a concept; key features of virtualisation and current cloud platforms available.

**K64:** The main factors that affect network performance, and how to mitigate these on network performance by implementing changes to QoS. For example, Traffic Shaping, Policing, Queuing, Topology (physical and logical), and Network Policy (Traffic Analysis, DPI (Deep Packet Inspection)).

**K65:** Principles of failure modes in protocols. For example, why a protocol may 'hang' and the effect of data communication errors and approaches to addressing failures to optimise network performance.

**K66:** Key security concepts. For example threats, vulnerabilities, exploits, detection and mitigation techniques, and security program elements such as user awareness, physical access control, multi-layer defence models.

**K67:** SDN (Software Defined Networking) and Network Function Virtualisation Core Principles. For example, Control Plane Separation, flexibility, overlay networks, disassociation of software and hardware layers.

**K68:** Key elements of mobile networks. For example RAN (Radio Access Network), EPC (Evolved Packet Core), IMS (IP Multimedia Subsystem) including some specific key functions such as S/P/U-Gateways and the concepts in communicating over free-space media such as interference, ground bounce, encryption and in mobile endpoint platforms such as tracking user location and roaming.

## Skills

**S1:** Analyse a business problem to identify the role of digital and technology solutions.

**S2:** Identify risks, determine mitigation strategies and opportunities for improvement in a digital and technology solutions project.

**S3:** Analyse a business problem in order to specify an appropriate digital and technology solution.

**S4:** Initiate, design, code, test and debug a software component for a digital and technology solution.

**S5:** Apply relevant standard processes, methods, techniques and tools. For example, ISO Standards, Waterfall, Agile in a digital and technology solution project.

**S6:** Manage digital and technology solutions projects. For example, identifying and resolving deviations from specification, applying appropriate Project Management methodologies.

**S7:** Work effectively within teams, leading on appropriate digital technology solution activities.

**S8:** Apply relevant organisational theories. For example, change management principles, marketing approaches, strategic practice, and IT service management to a digital and technology solutions project.

**S9:** Apply relevant security and resilience techniques to a digital and technology solution. For example, risk assessments, mitigation strategies.

**S10:** Initiate, design, implement and debug a data product for a digital and technology solution.

**S11:** Determine and use appropriate data analysis techniques. For example, Text, Statistical, Diagnostic or Predictive Analysis to assess a digital and technology solutions.

**S12:** Plan, design and manage simple computer networks with an overall focus on the services and capabilities that network infrastructure solutions enable in an organisational context.

**S13:** Report effectively to colleagues and stakeholders using the appropriate language and style, to meet the needs of the audience concerned.

**S14:** Research, investigate, and evaluate innovative technologies or approaches in the development of a digital and technology solution.

**S15:** Apply relevant legal, ethical, social and professional standards to a digital and technology solution.

**S16:** Identify and define software engineering problems that are non-routine and incompletely specified.

**S17:** Provide recommendations as to the most appropriate software engineering solution.

**S18:** Use appropriate analysis methods, approaches and techniques in software engineering projects to deliver an outcome that meets requirements.

**S19:** Implement software engineering projects using appropriate software engineering methods, approaches and techniques.

**S20:** Respond to changing priorities and problems arising within software engineering projects by making revised recommendations, and adapting plans as necessary, to fit the scenario being investigated.

**S21:** Determine, refine, adapt and use appropriate software engineering methods, approaches and techniques to evaluate software engineering project outcomes.

**S22:** Evaluate learning points arising from software engineering work undertaken on a project including use of methods, analysis undertaken, selection of approach and the outcome achieved, in order to identify both lessons learnt and recommendations for improvements to future projects.

**S23:** Extend and update software development knowledge with evidence from professional and academic sources by undertaking appropriate research to inform best practice and lead improvements in the organisation.

**S24:** Analyse client needs and determine how to advise them strategically through improved business processes, new ideas, or technology solutions.

- S25:** Effectively communicate value add to the client through a variety of media. For example, presentations, written reports, Storytelling in a professional setting through performing socio-technical process improvements in a range of environments.
- S26:** Make evidence based recommendations taking into account risks, costs, and benefits.
- S27:** Participate in walk-throughs for Information Technologies, to identify, document and evaluate key risks within a client's organisation.
- S28:** Perform stakeholder analysis to identify, determine and deepen understanding of system requirements and develop client relationships.
- S29:** Effect change within an organisation through evaluation of a new system, process or initiative.
- S30:** Ensure legal and ethical requirements are accommodated in the development of digital and technology solutions.
- S31:** Evaluate the success of new systems, processes, or initiatives.
- S32:** Use requirements elicitation, analysis and documentation to produce an acceptable solution for business problems or further opportunities.
- S33:** Conduct Process Analysis, Definition, Mapping and Modelling within a business situation without supervision.
- S34:** Produce Use Cases which are of value to all stakeholders of a system.
- S35:** Use tools and benchmarking to support modelling and requirements gathering and recommend approaches to team members as required.
- S36:** Produce a business case to scope a proposed project including business benefits and recommendations.
- S37:** Use products of analysis in the design and development of a system.
- S38:** Evaluate the impacts of model selection and how they inter-relate with each other when generating business analytics.
- S39:** Recommend and use appropriate software tools to implement Business Analysis tasks and outcomes.
- S40:** Discover, identify and analyse security threats, attack techniques and vulnerabilities and recommend mitigation and security controls.
- S41:** Undertake security risk assessments for complex systems without direct supervision and propose a remediation strategy relevant to the context of the organisation.
- S42:** Recommend improvements to the cyber security approaches of an organisation based on research into future potential cyber threats and considering threat trends.
- S43:** Manage cyber security risk.

**S44:** Use appropriate cyber security technology, tools and techniques in relation to the risks identified.

**S45:** Lead cyber security awareness campaigns and evaluate their effectiveness.

**S46:** Analyse cyber security requirements against other design requirements for systems or products, identify conflicting requirements and recommend appropriate solutions with clear explanation of costs and benefits.

**S47:** Lead the design and build of systems in accordance with a security case to address organisational challenges.

**S48:** Define Data Requirements and perform Data Collection, Data Processing and Data Cleansing.

**S49:** Apply different types of Data Analysis, as appropriate, to drive improvements for specific business problems.

**S50:** Find, present, communicate and disseminate data analysis outputs effectively and with high impact through creative storytelling, tailoring the message for the audience. Visualise data to tell compelling and actionable narratives by using the best medium for each audience, such as charts, graphs and dashboards.

**S51:** Identify barriers to effective analysis encountered both by analysts and their stakeholders within data analysis projects.

**S52:** Apply a range of techniques for analysing quantitative data such as data mining, time series forecasting, algorithms, statistics and modelling techniques to identify and predict trends and patterns in data.

**S53:** Apply exploratory or confirmatory approaches to analysing data. Validate and test stability of the results.

**S54:** Extract data from a range of sources. For example, databases, web services, open data.

**S55:** Analyse in detail large data sets, using a range of industry standard tools and data analysis methods.

**S56:** Identify and collate stakeholder needs in relation to computer network requirements, plans and designs.

**S57:** Plan, design, document, and develop the relevant elements of a computer network within an organisation or between organisations, taking into account customer requirements (performance, scale), constraints (budget, equipment availability), and define policies for their use.

**S58:** Monitor performance and ensure networks are configured correctly and perform as expected by designers or architects. Undertake capacity management and audit of IP addressing and hosted devices.

**S59:** Investigate, troubleshoot and resolve data network faults in local and wide area environments, using information from multiple sources, Physically or Remotely by console connection. Recommend and implement short term fixes to restore service and, or, quality of

experience and recommend longer term changes to prevent recurrence or reduce impact of future occurrences.

**S60:** Implement computer networks from a design including testing and validation. This includes populating variables in configurations, for example, IP addresses and subsequent application of configuration to equipment such as routers, switches, firewalls.

**S61:** Secure network systems by establishing and enforcing policies, and defining and monitoring access. Support and administer firewall environments in line with IT security policy.

**S62:** Research and evaluate emerging network technologies and assess relevance to current network requirements. Provide an objective opinion on how new features and technologies may be incorporated as required by the organisation.

**S63:** Investigate security concerns or attacks. For example, Distributed Denial of Service (DDOS), port scanning, assessing key metrics and indicators, evidencing the chosen steps to mitigate.

## Behaviours

**B1:** Has a strong work ethic and commitment in order to meet the standards required.

**B2:** Reliable, objective and capable of both independent and team working.

**B3:** Acts with integrity with respect to ethical, legal and regulatory requirements ensuring the protection of personal data, safety and security.

**B4:** Commits to continuous professional development; maintaining their knowledge and skills in relation to developments in digital and technology solutions that influence their work.

**B5:** Interacts professionally with people from technical and non-technical backgrounds. Presents data and conclusions in an evidently truthful, concise and appropriate manner.

**B6:** Participates in and shares best practice in their organisation, and the wider community for aspects relevant to digital and technology solutions.

**B7:** Maintains awareness of trends and innovations in the subject area, utilising a range of academic literature, online sources, community interaction, conference attendance and other methods which can deliver business value.

**B8:** Champions diversity and inclusion in their work ensuring that digital technology solutions are accessible.

## Qualifications

### English and Maths

Apprentices without level 2 English and maths will need to achieve this level prior to taking the End-Point Assessment. For those with an education, health and care plan or a legacy statement, the apprenticeship's English and maths minimum requirement is Entry Level 3. A British Sign Language (BSL) qualification is an alternative to the English qualification for those whose primary language is BSL.

### Other mandatory qualifications

## Digital and Technology Solutions Professional

Level: 6 (integrated degree)

### Professional recognition

This standard aligns with the following professional recognition:

- British Computer Society for Registered IT Technician (RITTech)

## Version log

Version	Change detail	Earliest start date	Latest start date	Latest end date
1.2	Standard, end-point assessment plan and funding band revised	01/09/2023	Not set	Not set
1.1	The funding band for this standard has been reviewed as part of the apprenticeship funding band review. The new funding band is £25000	13/05/2019	31/08/2023	Not set
1.0	Approved for delivery	26/03/2015	12/05/2019	Not set

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