

## **Degree Apprenticeship Standard - Principal Technologist**

**Occupational Roles:** This Standard would cover people working in the following technical specialisms: Head of Technology Engineering, Test, or Architecture, Technology Manager, Principal Broadcast & Media Engineer, Principal Broadcast Systems/Operations Engineer, Lead or Senior Product Manager, Lead or Senior Technology Architect, Test Manager, Principal Tester, System or Product Owner (Specialist), Research & Development Technologist, Commissioning, Delivery and Service Manager, Distribution or Delivery Manager, Head of Delivery, Service Delivery Manager, Broadcast Services Manager, Product Service Manager, Director of Broadcast Media Services.

### **Occupational overview:**

This Principal Technologist standard within the Broadcast & Media Communications sector works in parallel with the Digital & Technology Solution Specialist standard. This standard specialises on industry professionals who have the technical authority to enable or launch a Media Channels, Networks or delivery platforms & services. They lead and apply technology research and understanding of complex engineering and technology concepts through to innovation, development and implementation of new products and services which have significant impact on business strategy and the industry.

They apply technology to meet research, development, innovation, enterprise and business needs. Principal Technologists will often integrate old legacy systems with new. Advancing media technology, working with internal and external organisations to set global industry standards and creating the most effective and accessible media experiences for audiences and creators alike. They are motivated learners with deep understanding of the requirements and technology for the media production and delivery platforms & systems infrastructure and how it evolves in the future. They have the ability to absorb and interpret new concepts quickly and to identify insights and opportunities presented by new and emerging technology which will have significant impact and benefit for customers. Principal Technologists are accountable for all technology solutions within a Broadcast & Media Communications organisation, from microphone to delivery. The role could be based in an office or on site, and may involve out of hours or irregular working.

The Broadcast & Media Communications Principal Technologist is an integrated Masters level degree apprenticeship programme, based upon a work based learning approach, which will typically be delivered over 24-36 months.

It is designed for those progressing into a Masters level (level 7) degree apprenticeship through a range of routes to suit different needs of employers. This will include graduates who have recently completed a full time undergraduate degree in either a relevant technology or non-technology related discipline.

It will also be suitable for existing staff identified by their companies as having the potential for technical leadership positions at a level where a business and management perspective together with the specialist technical skills is required for successful progression in the role.

**Level : 7**

**Duration of Apprenticeship:** Typically 24-36 months.

**This is a Core and Options Apprenticeship, all apprentices will undertake the Core element and then one of the Optional specialisms.**

### **1. Core Technical Management knowledge and skills**

The Principal Technologist:

#### **Knows and understands:**

- How to synthesise strategies from a range of approaches to achieve technical and business goals
- Organisational behaviour and how organisations integrate different management functions in the context of technological change
- The role of leadership in contemporary technology organisations
- Organisational structures and the roles of individuals and teams in an organisation, as well as the roles of their managers
- What motivates individuals and of how this relates to the operation of contemporary organisations
- The characteristics of effective teams and methods of maintaining successful teams
- The importance of professional behaviours and the challenge of communication
- Concepts such as “knowledge organisations” and the “customer-responsive culture”
- How to design and build resilient high availability systems

#### **Is able to:**

- Lead innovation and strategy in the use and application of broadcast and communications technology within their own business
- Contribute to, and lead, collaborative research projects with academic and industrial partners in order to develop technology applications
- Plan and deliver technology products, services and platforms across the Broadcaster/Platform Provider to improve audience experience and business efficiency
- Solve complex engineering and technical problems to enable the development of new products and services which support business strategy and impact the wider industry
- Plan and manage projects with clear identification of timescales, finance, resources, people, milestones and expected deliverables
- Research and explore the growth potential of new platforms and services
- Introduce new elements/processes/ways of working
- Create innovative designs, architecture, products and services to support business strategy
- Develop engineering standards and procedures, contributing to and shaping industry standards where appropriate
- Act as point of contact and technical authority responsible for providing technical consultancy to project delivery and development teams, procurement, service design and change management teams.
- Providing technical guidance to external and internal stakeholders including regulatory bodies
- Act as Lead Design Authority (LDA) on new and complex engineering and technology solutions, services and products, taking full accountability for the final technology solution
- Produce technical documentation, ensuring quality and accuracy
- Work collaboratively across their sector to ensure all stakeholders including device manufacturers, content providers and distributors are aligned and produce the best consumer experience

- Apply their knowledge at enterprise level
- Comply with Health and Safety legislation and organisational guidelines, processes and procedures with relevant local regulations

**Core Behaviours:**

- **Learning and research** – a passion for learning and research and the ability to absorb complex information quickly
- **Strategic Thinking** – understand and apply the opportunities and impact of their area of specialism to meet strategic business goals and to shape the wider industry
- **Collaboration** – working effectively with others internally and externally, sharing knowledge and expertise

**Broadcast & Media Communications Optional Skills and Knowledge**

**A. Principal Broadcast Engineer (Systems/Operational)**

The purpose of the Principal Broadcast Engineer is to provide specialist services and is therefore the interface between support teams, Project delivery teams and Technology suppliers. The Principal Engineer can provide systems ownership at architectural level including consultative & commissioning expertise. Principal Broadcast Engineers Designs, codes, tests, corrects and documents complex programs and scripts from agreed specifications, and subsequent iterations, using agreed standards and tools, to achieve a well-engineered result. Takes part in reviews of own work and leads reviews of colleagues’ work. They are in focused on forward looking, proactive work on technology systems. Working with both junior and senior people on development, projects and planned changes to ensure they are managing appropriately, fit for purpose and safe for the live environment.

**Technical knowledge for L7 Principal Broadcast Engineer (Systems/Operational)**

Knows and understands:

- The rationale specific to Broadcast Media & Communications platform and solution development, including the organisational context
- The various inputs, statements of requirements, security considerations and constraints that guide solution architecture and the development of logical and physical systems' designs
- The methodologies designed to help create approaches for organising the engineering process, the activities that need to be undertaken at different stages in the life-cycle and techniques for managing risks in delivering varied solutions
- The approaches used to modularise a system/product and describe the structure and behaviour of applications/services used in a business, with a focus on how they interact with each other and with business users
- How to design, develop and deploy broadcast technology solutions that are secure and effective in delivering the requirements of stakeholders and the factors that affect the design and implementation of a successful outcomes
- The range of metrics which might be used to evaluate a delivered technical project

**Skills for L7 Principal Broadcast Engineer (Systems/Operational)**

Be able to:

### **System Architecture**

- Ensure broadcast & media communication systems design and architecture is fit for purpose, including disaster recovery architecture
- Monitor systems roadmap, identifies, risk and risk mitigation and areas for system improvement

### **System Management**

- Ensure that solutions and designs are performant to industry standards and deliver responsive solutions with good test coverage
- Work with Developers, Product & Test Managers to ensure system performance is continuously improved through the application of problem management
- Ensures systems are properly supported by operational support engineers and 3<sup>rd</sup> party suppliers, developing and maintaining systems monitoring tools to enhance supportability of systems supported
- Investigate and resolve escalated incidents and problems, within agreed timescales, ensuring key stakeholders are kept informed on progress
- Be accountable for the quality of deliverables from one or more software development teams (source code quality, automated testing, design quality, documentation etc.) and following company standard processes (code reviews, unit testing, source code management etc)
- Work with project & service delivery teams responsible for the commissioning and acceptance ensuring new installations/services are fit for purpose, supportable, and are built against agreed specification and installation standards
- Assess, design and deliver training for systems under ownership ensuring support teams can be appropriately trained

### **Incident and Problem Management**

- Assist with the command & control for major incident and service outages
- Responsible for problem management for systems assigned, ensures that known issues and workarounds are documented and input into the Knowledge Management Solution

### **Change, Configuration and Release Management**

- Responsible for ensuring that change management procedures are followed
- Responsible for minor/major software and hardware upgrades, working with the release management team responsible for User Acceptance Testing (UAT), testing and deployment of upgrades into the production environment

## **B. Principal Broadcast & Media Systems Solutions Specialist**

Systems Solutions Specialists within Broadcast & Media Communications will typically work as part of a multi-specialist team to ensure that the technology and architecture strategy are implemented in the area they support, to transform business capabilities and enable the next generation of Broadcast & Digital Media services using IP-based transport technology systems. They will be the subject matter expert in their field with specialist domain expertise in at least one technology, software, infrastructure, application, service or broadcast & production domain. They will ensure that strategy is delivered using standardised, reusable and innovative architecture and ensure consistency and standardisation of architecture and related best practices.

### **Technical knowledge for L7 *Principal Broadcast & Media Systems Solutions Specialist***

Knows and understands:

- Data and evidence-based approach to decision making with a creative and driven approach to problem-solving
- Financial and business implications of their specialism architecture choices and alternatives
- The asset landscape within the area that they support
- Multiple online and IP technologies. This includes web development (HTML, Javascript, etc), native app development, and backend technologies, including API's, networking and databases, IP Transport Systems, and Data Systems Architecture and service design
- Specialist technology such as video handling and developing games
- Cloud-based Services and always-on platform-approach to the services made

### **Skills for L7 *Principal Broadcast & Media Systems Solutions Specialist***

Be able to:

- Develop the vision and strategy for the area(s) they are accountable; maintaining an awareness of the underlying business and technical strategic drivers and challenges faced by the Broadcast and Media Communications sector.
- Develop plans, designs and drawings that take a vision from idea to reality, incorporating the overall vision you will deliver adaptable, scalable solutions for the area of the business they support.
- Identify gaps and potential fragilities and support the development of appropriate solutions; including working with external suppliers to align requirements with solutions.
- Participate in the incubation of emerging technologies, architectures and approaches in order to test whether they will enable the organisation to deliver its objectives and seize opportunities in a timely manner.
- Assist with solving business challenges through innovation, striving for improved predictability, performance, efficiency, effectiveness and resilience
- Ensure that the development and release cycle is agile, embracing Continuous Delivery and DevOps
- Lead projects which transform technology and business process within an organisation
- Negotiate and use conflict-handling skills to ensure the best outcome for the organisation in the face of complexity and uncertainty

- Work in an environment that is responsible for Media Asset Management (MAM), designing, developing and delivering technology solutions used for the long-term storage and archiving of media based content

### **C. Principal Research & Development (R&D) Technologist**

Research and Development activities cover developing technologies and insights that ensure Broadcast & Media Communication organisations stay relevant in the medium to long-term (5-10 years). This involves leading technology change and impacts the whole organisation and the global industry.

Solutions developed routinely can save organisations millions of pounds. Technologists in R&D are responsible for conducting R&D activities and transferring results, in order to identify and solve complex technical problems and carry out ground breaking research in relevant areas, deliver solutions for the organisation, inform the decisions the organisation make and help create products and services, or to contribute to global standards by often jointly collaborating with manufacturers and universities in order to achieve these goals.

#### **Technical knowledge for L7 Principal Research & Development (R&D) Technologist**

Knows and understands:

- Specialisms such as Broadcast Engineering, Computer Science, Electronics, Maths, Physics, Psychology, Human-Computer Interaction, Data Science or similar relevant science , engineering or technical subjects
- Comprehensive knowledge of current standards and practices in broadcast or software engineering, human-computer interaction and/or behavioural scientific research.
- Awareness of emerging trends and developments in relevant technologies
- The rationale for software platform and solution development, including the organisational context
- The methodologies designed to help create approaches for organising the engineering research and development process, the activities that need to be undertaken at different stages in the life-cycle and techniques for managing risks in delivering innovative solutions

#### **Skills for L7 Principal Research & Development (R & D) Technologist**

Be able to:

- Apply creative thinking, analysis and good judgement to propose innovative solutions to technical problems, which involve a range of diverse approaches
- Produce and test prototype implementations of systems to help answer research questions
- Present and share results of R&D developments to a wide audience in the form of systems for operational use or advice; e.g. inputs to standards bodies, open source software, or licensing to manufacturers in order to ensure that the work has an impact
- Evaluate technology through activities such as programme trials, lab tests and user tests in order to determine its suitability and effectiveness
- Identify and follow-up opportunities for learning and development to ensure skill set meets evolving requirements and stay at the forefront of relevant scientific and technology areas
- Assist with management of a team of more junior engineers to achieve project aims

- Demonstrate capability for highly original work together with an enquiring mind with well-developed analytical and investigative skills

#### ***D. Commissioning, Distribution, Delivery Systems Principal Technologist***

Principal Technologists within Broadcast & Media Communications under System/Product commissioning, service/content distribution and delivery of services to enterprise organisations deliver change programmes and projects providing leadership and line management for the media technology-based delivery product team. Principal Technologists at this level can also be responsible for the service delivery of transmission of live/pre-recorded content across all domestic and international TV channels, Radio stations and frequencies, Satellite, Cable, IP Delivery Content Partners (inc mobile networks (3/4/5G)). Managing outsourced delivery contracts including for coding and multiplexing, uplinking and broadcast transmissions.

Broadcast & Media Communication organisations small and large require disciplined individuals who are the technical authority and manage strategic projects, often leading other Principal Technologists and delivering complex multi-platform (TV/Radio/Online/Live Events & Interactive) services to audiences. They liaise and manage technology solution providers both internally and externally (outsourced) of their organisation to ensure successful delivery of the portfolio of technology based change initiatives. They ensure strategic alignment between the whole organisation of technology product/service delivery to business needs.

Commissioning, Distribution, Delivery Systems Principal Technologists are the expert and adviser on all broadcast media technology-based delivery matters, ensuring that initiatives are delivered in line with industry good practice. They will be an effective senior manager and team player with the ability to manage effective relationships with a wide range of stakeholders. They will demonstrate personal commitment and accountability to ensure standards are continuously sustained and improved both within the internal teams, and with partner organisations and suppliers.

#### **Technical knowledge for L7 Commissioning Distribution, Delivery Systems Technologist**

Knows and understands:

- Production, news and broadcast media technologies
- Information Technology Infrastructure Library (ITIL) and IT architecture frameworks, processes, procedures, and roles.
- IT governance policies, processes, and procedures
- Enterprise IT within the media industry
- How to shape programmes and projects utilising a variety of delivery frameworks, methodologies and tools
- Legacy and future transmission network operations for Broadcasters and Media Platforms
- Broadcast & media communications transmission principals

#### **Skills for L7 Commissioning Distribution, Delivery Systems Technologist**

Be able to:

- Define and ensure technical performance and contractual Service Level Agreements (SLAs) and Key Performance Indicators (KPIs) are met by technology suppliers
- Lead large multi-stream programmes in complex, multiple stakeholder, matrix managed technology environments.

- Work with external technology/platform suppliers to ensure operational excellence of the varying transmission networks by identification of improvement by investigating and ensuring the resolution of incidents and through continuous performance monitoring
- Deliver projects in an outsourced environment, liaising with multiple business units, conflicting priorities and projects (both internal and external service providers and suppliers) at the same time
- Take a complex technical need or solution and explain it to a non-technical audience so that the impact on the business is easily understood.
- Prioritise resources to ensure successful completion of complex projects to budget and timescale
- Interpret complex financial data, manage budgets and ensure effective financial control

**Qualifications:** Apprentices will complete a relevant Masters degree in Broadcast or Communications Technology. Apprentices without level 2 English and Maths will need to achieve this level prior to taking the end-point assessment.

**Link to professional registration:** TBC

**Review date:** September 2020