A Method for using Processes to improve the Quality of Software

BCS Webinar - 26th April 2021

Sue Turner

Sue Turner

- Consultant in Software Quality and Business Process Analysis

- Member of the Internal TickITplus Association

- Maintain websites for TickITplus and two charities

Definitions

- Quality:
  - ➤ degree to which a set of inherent characteristics of an object fulfils requirements [ISO 9000:2015]

- Process:
  - ➤ set of interrelated or interacting activities that use inputs to deliver an intended result [ISO 9000:2015]

- Management System:
  - ➤ set of interrelated or interacting elements of an organization to establish policies and objectives, and processes to achieve those objectives [ISO 9000:2015]

Quality of Software

- Quality of People

- Quality of Tools

- Quality of Processes

- Quality of the Documentation of the Processes

Defining the Process

- What is the intended result?

- What are the inputs?

- What are the outputs?

- What are the steps in the process?

- Document the process

- Review and improve the process

Management Systems

- Quality Management System
  - ➤ ISO 9001

- IT Information Security Management System
  - ➤ ISO/IEC 27001

- IT Service Management
  - ➤ ISO/IEC 20000-1

- Integrated Management System
  - ➤ ISO 9001 + ISO 14001 + ISO 45001 + etc
  - ➤ ISO 9001 + ISO 20000-1

Sector Specifics

- Medical devices - ISO 13485

- Railway Applications - ISO 22163

- Automobile - IATF 16949

- Aviation, Space and Defence - AS 9100

- Software - TickIT*plus*

TickIT*plus*

- Wider in scope than ISO 9001 and TickIT
  - ➤ Covers ISO 9001, ISO/IEC 20000, ISO/IEC 27001, BS 10754-1, ISO 26262

- Improved Certification process
  - ➤ Capability Levels - Foundation, Bronze, Silver, Gold, Platinum
  - ➤ Practitioner role
  - ➤ Exploration or Confirmation mode

TickITplus Base Process Library

- 40 Base Processes
  - ➢ Organizational, Project, Technical, Agreement, IT-specific, Maturity

- 8 Scope Profiles

- Selected Base Processes
  - ➢ Mandatory Base Processes (Type A)
  - ➢ Mandatory for the chosen Scope Profile (Type B)
  - ➢ Additional optional Base Processes (Type C)
  - ➢ Maturity Level Base Processes (Type M)

Mandatory Processes (Type A)

- ORG.1 Human Resource Management

- ORG.2 Management Framework

- ORG.3 Corporate Management and Legal

- ORG.4 Infrastructure and Work Environment Management

- ORG.5 Improvement

- ORG.6 Measurement and Analysis

- ORG.7 Customer Focus

- ORG.8 Risk Management

- TEC.1 Data Management

Mandatory Processes (Type B)

- ORG.10 Lifecycle Model Management

- PRJ.1 Project Management

- PRJ.3 Configuration and Change Management

- PRJ.5 Problem and Incident Management

- TEC.10 Stakeholder Requirements Management

- TEC.11 Requirements Analysis

- TEC.13 Architectural Design

- TEC.14 Development Implementation

- TEC.3 Integration Management

- TEC.4 Verification

- TEC.5 Validation

- TEC.6 Transition and Release Management

Optional Processes (Type C)

- TEC.8 Maintenance Management

- AGR.1 Acquisition and Contract Management

- AGR.2 Supply Management and Business Relationships

Base Practices

- 3 to 9 Base Practices for each Base Process
- Example: TEC.14 Development Implementation
  - ➢ BP.1 Establish the Development Environment
  - ➢ BP.2 Identify Component Sources
  - ➢ BP.3 Design Components
  - ➢ BP.4 Implement Components
  - ➢ BP.5 Manage Changes to the Detailed Design and Product Components

Base Practice

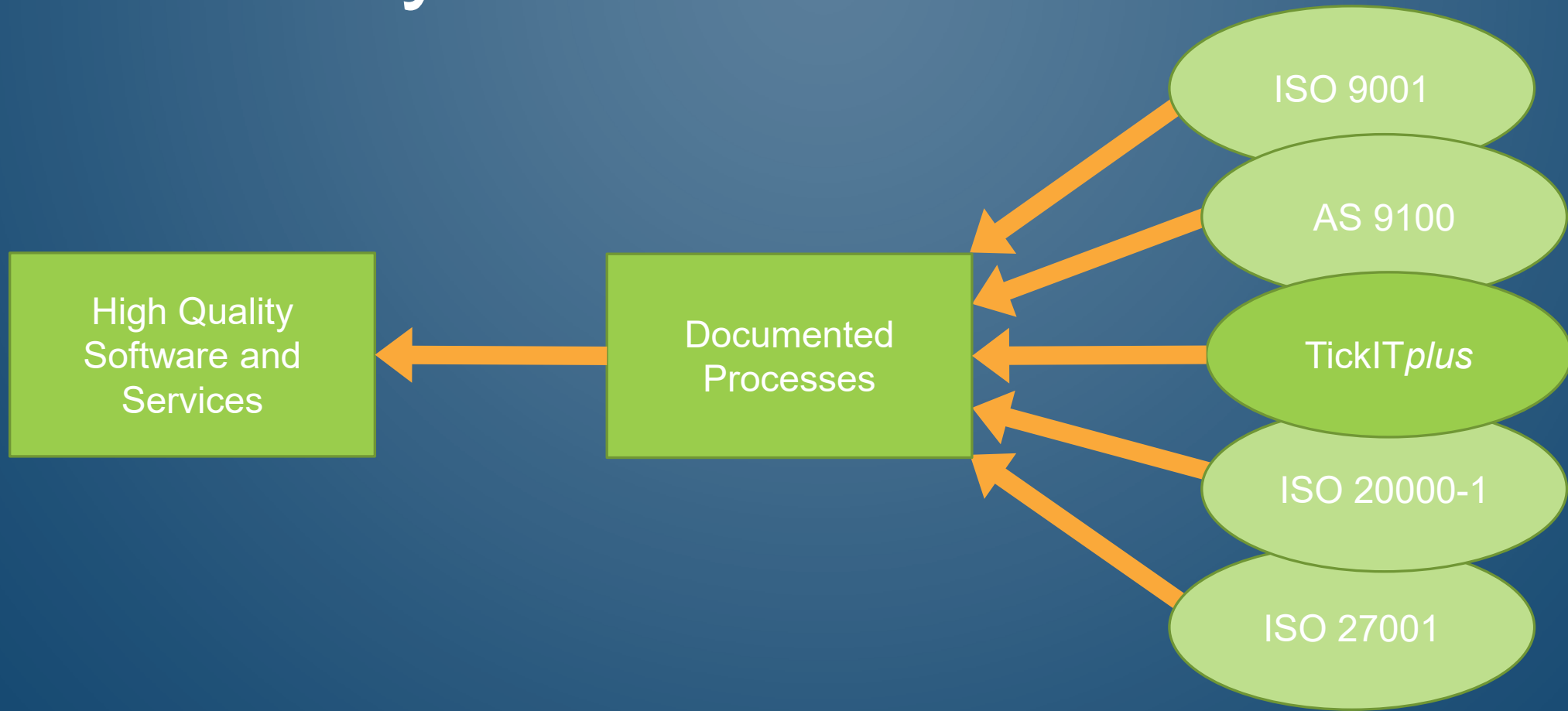- TEC.14 Development Implementation
  - ➢ BP.3 Design Components

Process Base Practices	Input Work Products	Output Work Products	ISO 9001: 2015
BP.3 Design Components **Components and interfaces are designed to ensure that they meet the architectural design, system requirements and design standards.** **Traceability between the system requirements and product and system components is established and monitored.** **The designs are reviewed, approved and maintained under configuration management.**	Architectural Design System Requirements	Detailed Design Traceability Report	7.5 8.2.3 8.3.5

Process Reference Model

Process Base Practices	Input Work Products	Output Work Products
BP.3 Design Components Components and interfaces are designed to ensure that they meet the architectural design, system requirements and design standards. Traceability between the system requirements and product and system components is established and monitored. The designs are reviewed, approved and maintained under configuration management.	Architectural Design System Requirements	Detailed Design Traceability Report

Compliance Processes	Input Work Products	Output Work Products
05001 Maintain design in Enterprise Architect	Software Design Specification document	Detailed Design (in Enterprise Architect)
05002 Maintain VCRM	Requirements (in DOORS)	Verification Cross Reference Matrix

Summary

High Quality Software and Services ← Documented Processes ← ISO 9001, AS 9100, TickIT*plus*, ISO 20000-1, ISO 27001

For more information

- TickITplus.org
  - ➢ Training
  - ➢ Certification
  - ➢ Scheme Documentation and Guidance
  - ➢ Organisations that are certified to TickITplus
  - ➢ Certification Bodies

A Method for using Processes to improve the Quality of Software

Email: bcs@turner-solutions.co.uk

Sue Turner