Activity – Quality Management Models

1. **Why do you think that so many frameworks have evolved around the concept of quality metric definition?**

As Martin et al. (2020) noted, the definition of quality metrics varies across frameworks due to different factors. Organisations establish their quality definitions based on industry, customers, and objectives. However, what's truly fascinating is how emerging frameworks are keeping pace with evolving business practices and technologies and offering more pertinent metrics for the present context. This adaptability underscores the relevance and applicability of quality management frameworks in our dynamic world.

2. **Which one is the current one?**

Partelow (2023) emphasises the importance of frameworks in various fields, including environmental and social sciences, governance research, sustainability sciences, and social-ecological systems research. They are integral to shaping research programs and collecting new data, providing a foundation for our work. However, it's essential to acknowledge that their development and application can be complex, often due to their opaque nature and the perspectives of their creators. This complexity leads to diverse methods and data, creating methodological gaps that must be addressed.

No single quality management framework is sufficient to address these gaps, as they often complement each other. It is crucial to recognise that popular frameworks such as Total Quality Management (TQM), Six Sigma, ISO 9001, and lean production are more than just tools. As Bakator et al. (2018) eloquently put it, they are the embodiment of excellence. These frameworks not only acknowledge organisations that excel in

TQM principles, performance across various sectors, and customer focus but also symbolise aspiration and achievement in our field.

3. **Which one(s) are applicable to agile methodologies?**

Incorporating principles from Japanese philosophy, Agile methodologies have become integral in project management, including Kanban, Lean, Scrum, Extreme Programming, and RUP. Agile methodologies prioritise planning, control, and efficiency to minimise waste and add value. The Agile Manifesto, established in 2001, emphasises four fundamental principles: prioritising individuals and interactions over processes and tools, working software over comprehensive documentation, customer collaboration over contract negotiation, and adapting to change over following a strict plan. Scrum, developed in 1993, aims to be faster, more efficient, and more reliable for the technology industry. Metrics are essential for evaluating project performance and ensuring quality (Almeida & Carneiro, 2023).

Agile methodologies strongly emphasise adaptability and quick feedback loops, using Scrum, Kanban, and Extreme Programming frameworks. Scrum organises work into sprints, with regular reviews and adjustments. Kanban focuses on visualising work, limiting progress, and optimising task flow. Extreme Programming emphasises technical excellence, customer satisfaction, and continuous improvement (Daraojimba et al., 2024).

4. **Which one do you consider to be the most suitable, and why?**

Selecting the most appropriate framework based on the organisation's specific needs is essential. Total Quality Management (TQM) is a comprehensive approach to enhancing organisational performance to meet customer requirements and satisfaction (Khurshid et al., 2018). Nonetheless, its reliability and validity have been

scrutinised across various industries and countries. To address these concerns, TQM should integrate community-related issues and environmental focus, ensuring that organisations fulfil their societal and stakeholder responsibilities.

On the other hand, Six Sigma aims to minimise waste in a coating process by emphasising statistical tools and techniques, ultimately leading to significant financial benefits (Bañuelas et al. 2005).

As suggested by Virtanen (2018), Kanban, Test-Driven Development (TDD), and Acceptance Test-Driven Development (ATDD) are recommended frameworks for ensuring quality throughout the software development process in Agile development teams.

Kanban is an agile method that focuses on process and project improvement. It aims to identify the optimal relationship between replenishment value, resource capacity, and work-in-progress limits to ensure a sustainable workflow pace and minimise idleness (Damij & Damij, 2021). At the same time, TDD and ATDD are agile software development process models that build software in small iterations using automated testing before coding. TDD aims to reduce defect rates and improve code quality by writing clean code and refactoring accordingly. It requires a computerised testing framework and follows two rules: always write code only if a test fails and remove duplication (Anwer et al. 2017).

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