Quality 4.0: What does it mean for the Quality Profession?

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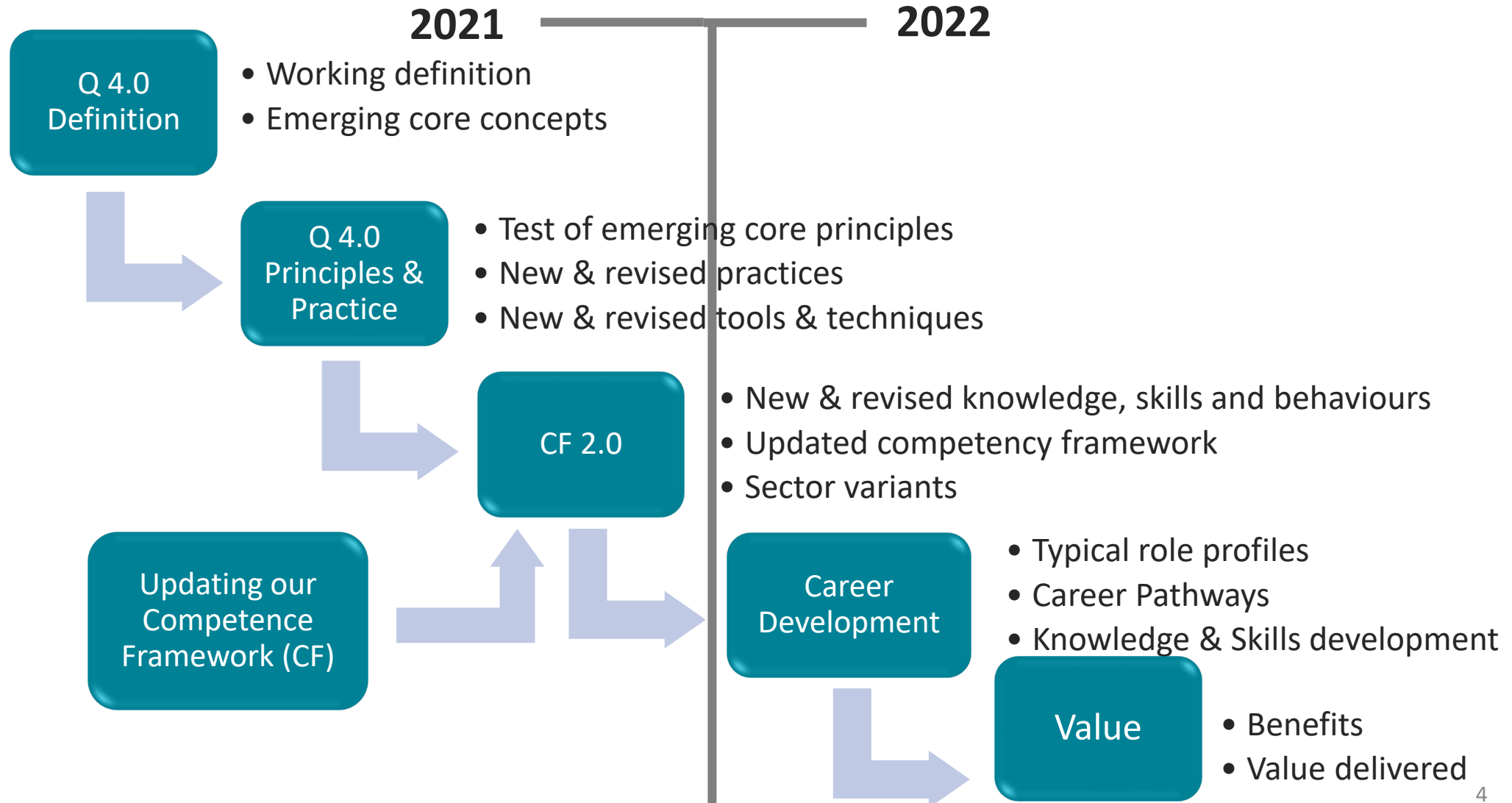
4 & 5 August 2021

Why Quality 4.0 Is Important To The Profession

The CQI's response – Our Research Programme

Stage 1 – Developing a Working Definition

Where Next?

Q & A

LEADING QUALITY FOR 100 YEARS

- Technology is a disruptive force for change
- It is transforming stakeholder needs and business operations at almost every level
- This transformation has a variety of "titles"
- Our profession has adopted "Quality 4.0"
- Quality 4.0 presents significant opportunities and threats to the profession

The CQI's Q 4.0 Research Programme

2021   **2022**

Q 4.0 Definition
- Working definition
- Emerging core concepts

Q 4.0 Principles & Practice
- Test of emerging core principles
- New & revised practices
- New & revised tools & techniques

CF 2.0
- New & revised knowledge, skills and behaviours
- Updated competency framework
- Sector variants

Updating our Competence Framework (CF)

Career Development
- Typical role profiles
- Career Pathways
- Knowledge & Skills development

Value
- Benefits
- Value delivered

4

The Objective Of This First Project

To develop a working definition of Quality 4.0 (Q 4.0) to drive the rest of the research agenda, and to help the CQI's members to better understand what it is, how it is developing and what could be the implications for the discipline of Quality Management.

The Scope Of This Work

This research is…

- Primarily intended for the CQI's members

- A work-in-progress

- Based on a rigorous process of enquiry

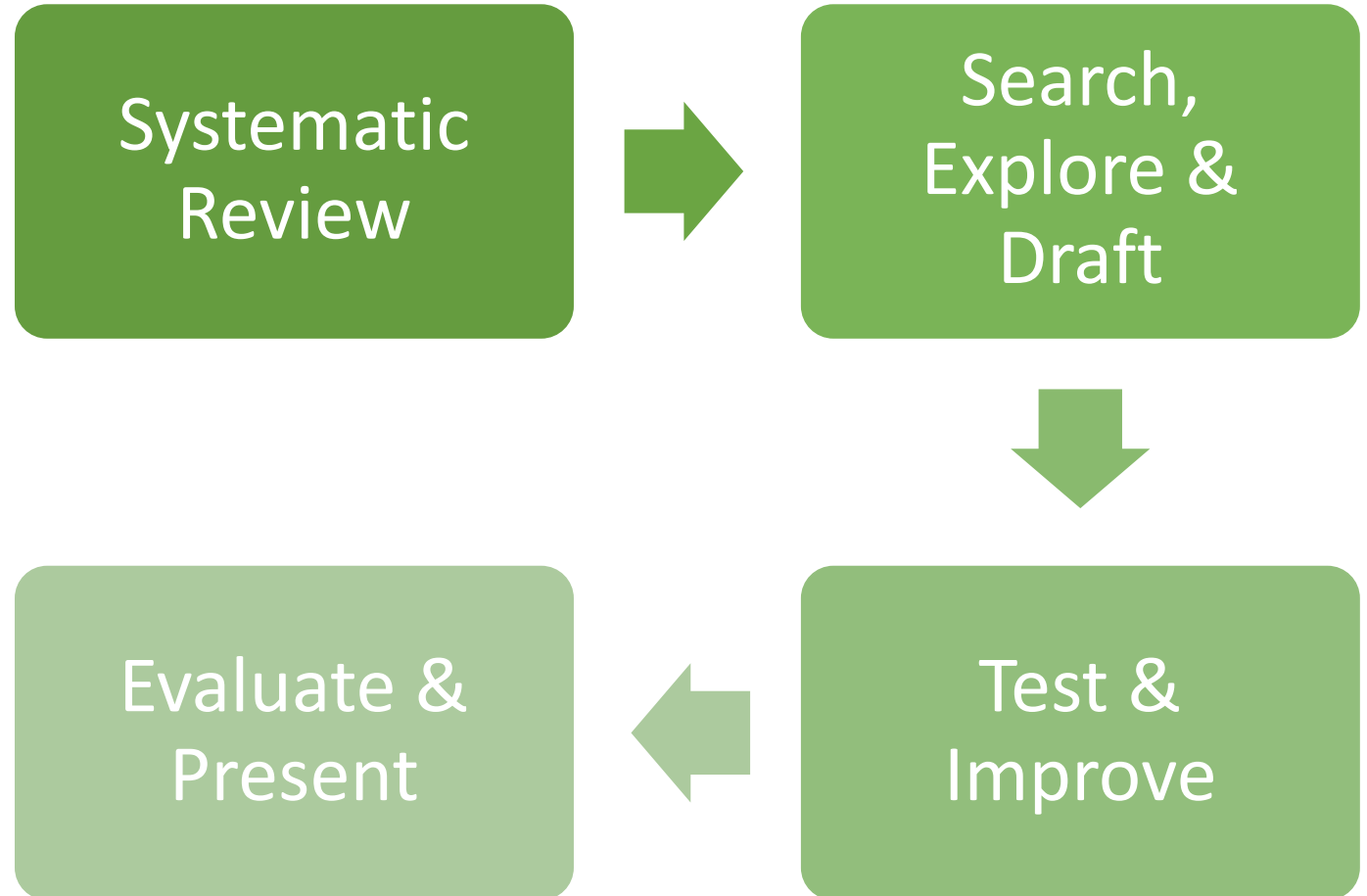- Respectful of existing published work

- A means to and end

This research is not…

- An attempt to establish a global standard

- The definitive "answer"

- Dreamt up in the bath, i.e., pure opinion
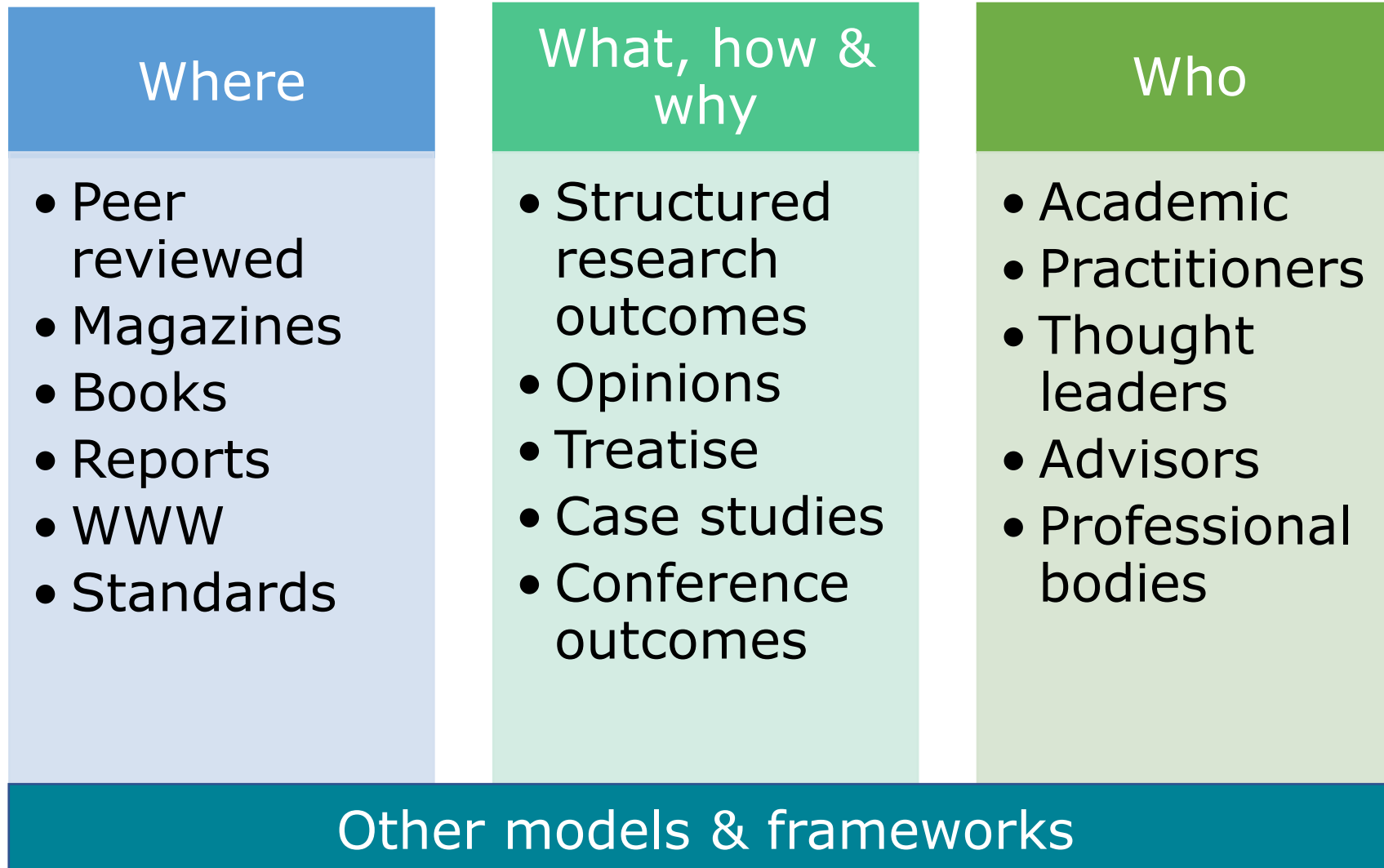
- An exercise in thought leadership only

The Research Methodology

The research process comprised 4 steps:

1. Carry out a systematic literature review
2. Create a draft definition and extract some key principles
3. Test the above with trusted sources
4. Evaluate the responses and create content to share

Systematic Review → Search, Explore & Draft

Evaluate & Present ← Test & Improve

The Literature Review Process

Where	What, how & why	Who
• Peer reviewed • Magazines • Books • Reports • WWW • Standards	• Structured research outcomes • Opinions • Treatise • Case studies • Conference outcomes	• Academic • Practitioners • Thought leaders • Advisors • Professional bodies

Other models & frameworks

Test results on initial definition & principles

Agreement with Quality 4.0 definition drawn from literature

Category	Count
Strongly agree	10
Agree	17
Partially agree	11
Disagree	1
Strongly disagree	2
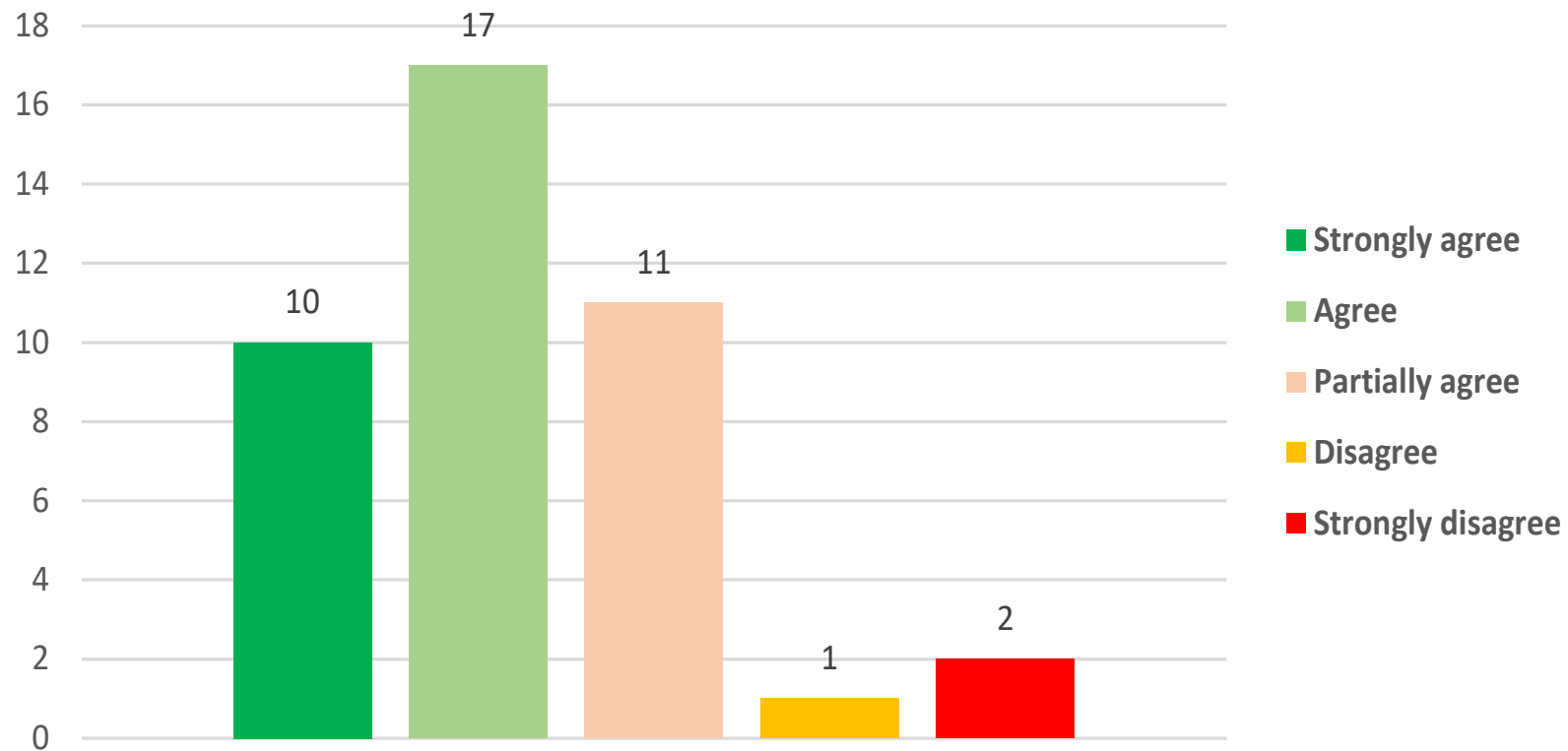
Over 80% of respondents believed the emerging principles to be important or very important.

Quality 4.0 Concept Definition

Our summary definition

"Quality 4.0 is the leveraging of technology with people to improve the quality of an organisation, its products, its services and the outcomes it creates."

Supported by Eight Core Principles

1. Co-creation of value
2. Cybernetics
3. Data value
4. Technology & combined intelligence
5. Cyber-physical systems
6. Transparency & collaboration
7. Rapid adaptive learning
8. Mutual trust

Principle 1 – Co-creation of Value

Customers and society are constantly redefining the value they require, and how and where they desire to consume it. Customer value co-creation is increasingly through digital servitisation.
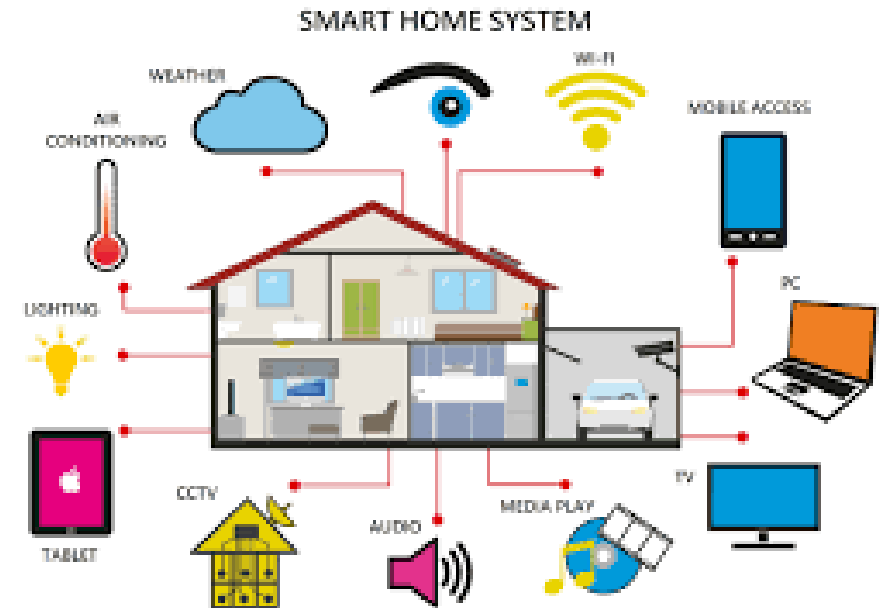
Principle 2 – Cybernetics

Data is captured from multiple sources across vertical, horizontal and end to end supply chains. Interconnected and smart networks in ecosystems are increasingly used to dynamically regulate and improve total system performance, including behaviours, inputs and outputs.
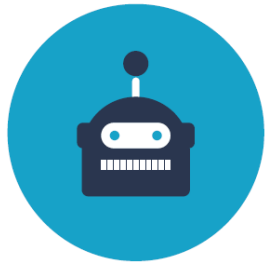
The Eight Core Principles

Principle 3 – Data Value

Data is increasingly a contextually-dependent strategic asset, requiring quality professionals to be knowledgeable in data governance, data architecture, data engineering and data analytics.

Principle 4 – Technology & Combined Intelligence

The vast array of enabling technology, machine learning and artificial intelligence augment human intelligence. The symbiotic human and machine relationship, in which virtual and real worlds co-exist, enables them to react, learn, make decisions and optimize quality processes.

Principle 5 – Cyber-Physical Systems

The balance and integration of human effort and machine effort, in the broadest sense, continually changes over time, automating some previously human roles and creating new ones around the co-design of cyber-physical quality systems.

Principle 6 – Transparency & Collaboration

The value chain is increasingly an integrated "smart" network of interrelated and interconnected cyber-physical systems. The ecosystems transcend traditional legacy boundaries and increasingly create whole-life circular economies. The customer, an active part of this network, requires both effective risk management and greater transparency and collaboration across multiple disciplines as technology networks expand.

Principle 7 – Rapid Adaptive Learning

Continuous and rapid adaptive learning from data characterises innovation and improvement in value creation. Changing customer expectations are met based on new predictive capabilities rather than being reactive. Quality of design, conformance and performance is increasingly managed and communicated virtually, together with agile development and integration of systems leading to greater connectedness.

Principle 8 – Mutual Trust

Mutual trust is vital to drive out fear of surveillance and fraud, and digital tools enable transparency in partnering and contract executions. Inter-system compliance is authenticated and immutable to give assurance and confidence leading to greater resilience.

Where next?

Stage 2 objectives:

- Map the eight core principles to the seven principles of Quality Management

- Identify the most relevant Q-4.0 practices, technologies and tools

- List the skills, experience, knowledge, and behaviours required

- Determine the value to an organisation of a quality professional whose competence is fit for the digitally enabled age

In summary

- This first project has developed a Concept Definition of Quality 4.0, supported by 8 Core Principles – the "what's" of Quality 4.0

- The CQI recognise that Quality 4.0 is a gamechanger for the quality profession

- Stage 2 is underway and will complete in Quarter 4 of this year

- The key output of this will be the "how's" of Q 4.0

- This will lead to a definition of the competences required of a quality profession that will thrive in the digitally-enabled age

The CQI wishes to thank all those that have contributed to this work and wishes to continue to share and collaborate with all related studies for the benefit of the profession and discipline, worldwide.