

Systems thinking &
RTO Standards 2015

White Paper

Table of contents

Systems and the RTO Standards 2015	3
Systems thinking: Explained	4
Systems thinking: Applied	8
VET and systems thinking	11
References	12



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Systems and the RTO Standards 2015

These two statements, taken from the Glossary of the RTO Standards 2015, acknowledge the concept of a system:

These Standards form part of the VET Quality Framework, a system which ensures the integrity of nationally recognised qualifications.

Australian Qualifications Framework (AQF) means the framework for regulated qualifications in the Australian education and training system.

The definition in the Glossary of an 'assessment system' does more than just acknowledge the concept; it seeks to articulate what such a system looks like in operation, and more importantly, the desired outcome. Consistency is the 'holy grail' of a systems approach. Presumably, at audit an RTO could be expected to provide evidence that it actually has an assessment system.

Assessment system is a coordinated set of documented policies and procedures (including assessment materials and tools) that ensure assessments are consistent and are based on the Principles of Assessment contained in Table 1.8-1 and the Rules of Evidence contained in Table 1.8-2.

Two of the lynchpins of a systems approach, when it becomes operational, are 'being systematic' and 'monitoring'. Both terms are liberally sprinkled through the Standards.

Standard	
1.6.	The RTO implements a range of strategies for industry engagement and systematically uses the outcome of that industry engagement to ensure the industry relevance of...
1.9.	The RTO implements a plan for ongoing systematic validation of assessment practices and judgements that includes for each training product on the RTO's scope of registration.....
2.2.	The RTO: a) systematically monitors the RTO's training and assessment strategies and practices to ensure ongoing compliance with Standard 1; and b) systematically evaluates and uses the outcomes of the evaluations to continually improve the RTO's training and assessment strategies and practices....
2.4.	The RTO has sufficient strategies and resources to systematically monitor any services delivered on its behalf, and uses these to ensure that the services delivered comply with these Standards at all times.

Decision makers who have a grasp of systems thinking are able to deploy a simple but powerful set of concepts and tools that can increase both efficiency and effectiveness, which in turn helps meet compliance requirements.

Systems thinking: Explained

The concept

A system is a set of components that work together for the overall objectives of the whole. The components are interrelated and interdependent and together they form a unified whole. Systems are everywhere.

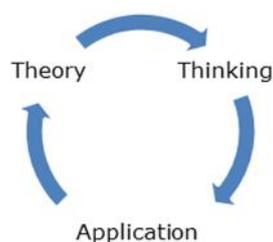
There are natural systems such as the planet or the human body, there are mental systems such as mathematics or music theory, and there are mechanical systems such as a car or washing machine. The most complex systems are social systems such as the family, an organisation, a city or a nation.



There are systems within a system and the more complex systems have many sub-systems. There is a sub-system of oceans on the planet which in turn contains many other sub-systems. There is a circulation system within the body and an ignition system within the car. A society is a complex social system with a whole set of government and community systems within it.

Systems theory

Systems theory is a field of science that studies complex systems in nature, society and science. There is a solid theoretical base for systems theory, and the thinking that results from it, beginning with von Bertalanffy's work in the early Fifties on General Systems Theory. The Wikiquote link in the references at the end of this paper traces its growth and influence over the past six decades. The theory has been integral to the work of many 20th Century thinkers including Margaret Mead, Abraham Maslow, Thomas Kuhn, Stephen Hawking and Peter Drucker.



Kurt Lewin, the pioneer of action research methodology in the late Forties, applied systems thinking to the behaviour of groups and used it to prove that a group is composed of more than the sum of its individual members and so was born the theory of group dynamics.

W. Edwards Deming was one of the first to view the organisation as a system. He birthed total quality management when he published 'Out of Crisis' in 1982, which is based on systems thinking. The intention of the quality movement is that the four main components - quality planning, quality control, quality assurance and quality improvement – apply to the organisation as a system.

The ISO Quality Management System standards (ISO9000 series) are currently the most globally recognised of the quality management initiatives. They advocate a 'process approach' to improvement. The preface to Quality Management Systems Requirements (ISO 2008) acknowledges the systems thinking connection when it states that 'an activity or set of activities using resources, and managed in order to enable the transformation of inputs into outputs, can be considered as a process. Often the output from one process directly forms the input to the next'.

However, some quality management advocates focus entirely on processes without any regard for the role these processes have in a wider system. Any over-reliance on the 'process approach' denies the interdependent and interrelated nature of a complex system.

Systems thinking is also the cornerstone of Peter Senge's work and 'systems thinking' is actually the fifth discipline that unites the other four, in his seminal work on learning organisations 'The Fifth Discipline: The Art and Practice of the Learning Organisation' (1990).

The interdisciplinary nature of systems thinking has led to its application across a range of fields of endeavour. It has strongly influenced the current approach to project management and has given rise to systems engineering, systems biology, systems psychology and systems management.

Not systems theory

There are two opposing philosophical positions: reductionism and emergence. Reductionism holds that a complex system is simply the sum of its parts; therefore the complex system can be understood by understanding each constituent part. Emergence holds that a complex system results from the interaction of its parts and is therefore more than the isolated parts which collectively make up the system. Reductionism holds that $2+2=4$. Emergence holds that $2+2=5$.

Both perspectives are in evidence in all areas of human endeavour including politics, economics and organisational management. Functional management is a commonly recognised form of organisational management and it comes from the reductionist perspective. It is sometimes referred to as command and control thinking, which is the opposite end of the spectrum to systems thinking.

The functional management perspective organises personnel into units or departments on the basis of their technical role such as finance, despatch or engineering. Authority is hierarchical with a strict chain of command, there are extensive written rules and the units are usually isolated from each other, almost operating as 'silos'.

Functional management was championed in the early 20th Century by Max Weber as a counterpoint to some of the excesses of the patronage method of management that was in the ascendancy. He believed that hierarchies



were a rational way to maintain order, maximise efficiency and eliminate favouritism.

There are perceived advantages to this approach, especially in a large organisation. Senior management are able to maintain control because of the hierarchical chain of command, every individual is focused on a specialised task, rules and regulations provide predictability and stability, while extensive recordkeeping provides verification.

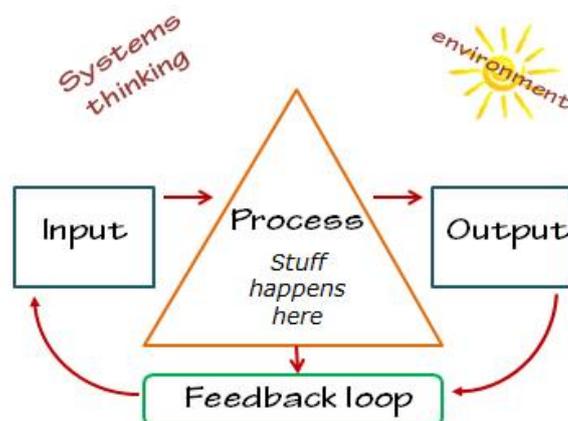
Opponents of this approach point out the abundance of red tape that comes from over reliance on rules and documentation, a person's focus on 'their job' rather than their role in the dynamics and success of the organisation, the lack of communication across departments that often results in low productivity, the inflexibility and lack of responsiveness to the external environmental, and the stifling of innovation because of the fragmented nature of the organisation.

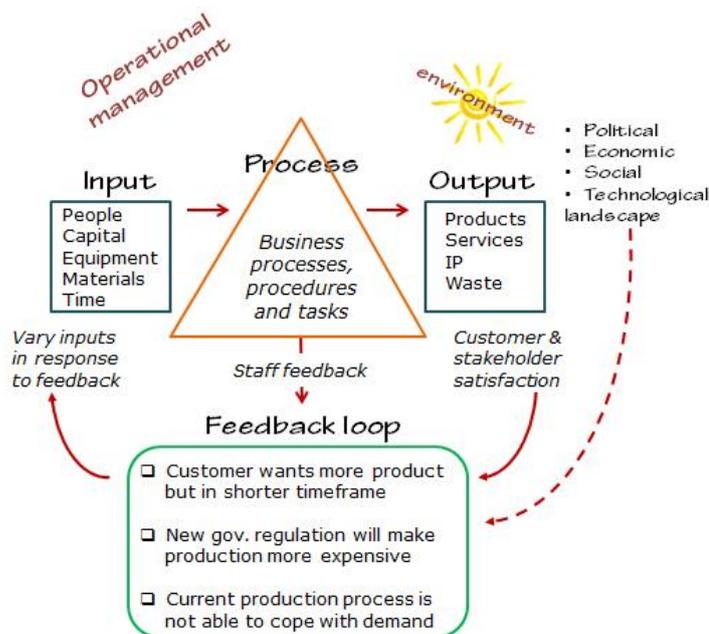
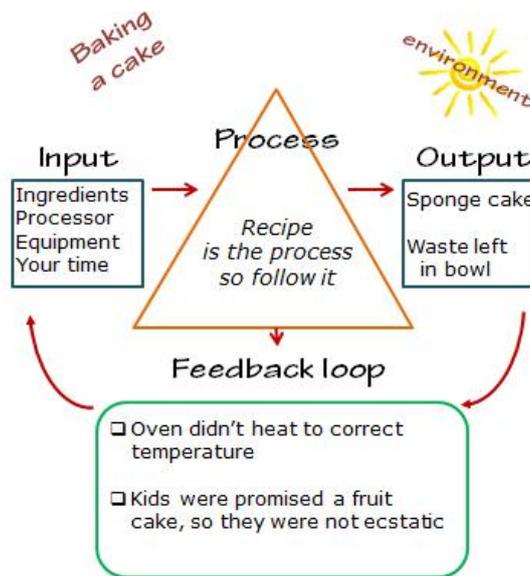
Functional management values order, predictability and stability. Systems management values connectedness, relationships and responsiveness. If the former can be represented by silos, then the latter can be visualised as scaffolding where the relationship among the various parts, rather than the parts themselves, is of most importance and the structure is dynamic because it is open to influence from the environment.



A system is simple and elegant

1. A system has inputs that are transformed by processes; the resulting outputs look very different to the inputs.
2. Data/information is constantly being gathered from a variety of sources about the efficiency and effectiveness of processes and also the quality of outputs.
3. This data/information becomes a feedback loop that informs decisions about how to vary inputs and processes in a way that continually improves processes and outputs.





A systematic approach is not a systems approach

Systematic approach and systems approach are not interchangeable terms. A systematic approach is an umbrella term that means something is being done methodically, regularly and in an orderly way. Both functional management and systems management can be implemented systematically. The advantages of a systematic approach are transparency and repeatability.

The goal of a systematic approach is efficiency. The goal of a systems approach is effectiveness and efficiency.

Systems thinking: Applied

The main themes that thread through the mountain of literature on systems theory and systems thinking, across a range of disciplines, are applied here to an organisation.

1. An organisation is open to the environment

An organisation is a dynamic, changing eco-system that is open to the environment. The external environment consists of influences on the organisation that cannot be directly controlled by the organisation. These can be political, economic, ecological, societal or technological in nature.

An organisation must be responsive to the external environment, which is constantly exerting pressure on it, to ensure not only survival but also sustained growth.

A highly effective organisation has permeable boundaries and is regularly exchanging feedback with its external environment. It conducts environmental scanning and market research and uses public relations, advertising, advocacy and education to influence the external environment.

It is the core business of senior management to be monitoring the external landscape, fine-tuning strategic decisions and guiding change across the organisation. Decision makers in sub-systems within a complex organisation should regard everything that happens outside the boundaries of their own operations as part of their system's external environment and monitor accordingly.

- ✓ Take a helicopter view of an organisation, or the VET sector, and think of it as a complex eco-system. See the patterns, relationships, connections, dependencies.
- ✓ Identify one change in the external environment and trace the impact of this variation across the 'eco-system'. An example: A change is made to a Training Package qualification. How does this impact on the Regulator, products and services, and your organisation's internal systems?

2. An organisation is a self-organising system

A complex system must have underlying order. The dynamic nature of the complex system means that non-linear and chaotic change can be accommodated by the system's self-organising capability. It is the complex system that coordinates the dense network of sub-systems.

When this facet is applied to an organisational management style, it becomes one where control is distributed to sub-systems and senior management has responsibility for central communication and coordination. This is sometimes visualised as a flat, or networked, management structure.

- ✓ Acknowledge change as a constant and non-linear phenomenon that is an integral part of a healthy eco-system.

3. Systems are nested - interdependent

An organisation is a complex system that consists of systems within systems within systems. Even though the whole is primary and the sub-systems secondary, the whole will not function without the parts. Every sub-system has a purpose within a larger system and all must work properly for the complex system to achieve its goals.

Dysfunction in one sub-system will impact negatively on other parts of the system. Edward Lorenz, the mathematician who developed Chaos Theory to explain atmospheric change, referred to this as the 'butterfly effect' where seemingly small changes in a sub-system, positive or negative, can produce large changes in the whole system.

Sub-systems can be grouped together in a logical way to support the organisation's top level processes. An organisation that deploys systems management will group sub-systems together to form management systems.

This transparent infrastructure facilitates monitoring, measurement and improvement of workflow and outputs. Management systems are also about accountability and so they support the distributed decision making inherent in a flat, or networked, management structure.

- ✓ Choose one process, such as assessment, and create a flowchart as a visual representation of how that process actually happens in the organisation.

4. Everything is connected - interrelated

A sub-system by itself is fundamentally meaningless. It only takes on a purpose when it is connected to other parts of the system and becomes part of a functioning whole. 'Systems theory reminds us that if you break up an elephant, you don't have a bunch of little elephants.' (McNamara).

All systems have boundaries. These are the points of contact between one sub-system and other systems. The output from one system will be the input for another system.

The finance unit is useless without the sales unit and the despatch unit. The sales order becomes input for the finance unit and the delivery order that is raised after the invoice has been paid is output from the finance unit; once despatch has this input (delivery order) they can act on it.

The most critical aspect of a complex system is the interaction between sub-systems. Operational challenges are often located at the interface between sub-systems. One phrase often used by systems thinkers is that 'the chain is only as strong as its weakest link'.

- ✓ Step back from a complex problem and see the interrelationship of parts to determine where, how and why the problem is having an impact. Focus on the interface between sub-systems.

5. The feedback loop is the lifeline

A system self-regulates through feedback. Therefore, an organisation can continually improve by responding to feedback.

A system gathers feedback from its external environment; one sub-system gets feedback from other sub-systems; customers provide feedback. Feedback can be quantitative or qualitative data, gathered systematically or anecdotally.

The feedback loop is a major communication channel and also a quality control mechanism for the organisation. Feedback about the quality of outputs can result in a variation to inputs, or changes to processes, which leads to improved outputs.

However, change in response to feedback must be managed to be effective. There must be a cyclical process in place to facilitate continual improvement. High performing organisations are continually collecting data, reviewing it and using this information to improve operations.

- ✓ Gather data/information and use this evidence to understand performance in place of opinions and custom.
- ✓ Use existing feedback mechanisms to improve operations; then trace the effectiveness, or otherwise, of these efforts.

Tools of a systems approach

There are numerous tools and techniques that can help implement and maintain a systems approach across an organisation. Some examples:

Tool	Purpose
Mind maps, spider diagrams, concept maps	Useful for recognising the multiple, complex (non-linear) relationships across the organisation.
Documented systems (What)	Each system/sub-system has its own processes, policies and procedures. Templates relevant to these processes assist with transparency and help minimise errors, or make them more traceable.
Systematic approach (How)	Once a system/sub-system has been recognised and formalised, it is critical to document how it will be monitored methodically to ensure continued optimal functioning.
Monitoring schedule, quality assurance calendar, (When)	Once a system/sub-system has been recognised and formalised, it is critical to document when it will be monitored to ensure continued optimal functioning.
Data collection tools	Surveys, interviews, focus groups, observations, level of engagement instruments, tracking logs, monitoring documents will all produce data that can be analysed and fed back into the cycle.
Reports and graphs	Visual representations of state of progress, level of compliance or relevant trends are invaluable for providing management with a snapshot of the current state of the organisation.

VET and systems thinking

The emergence perspective, in the form of a systems approach, has been a light but constant presence in documentation for VET regulation for the past fifteen years.

The Australian Recognition Framework (ARF) was published by ANTA in 1998 to govern the VET sector. The preface states that 'it is based on a quality assured approach to the registration of training organisations'. There is also a requirement that a quality endorsed RTO have 'a quality management system in place applicable to the education and training environment'.



The first Australian Quality Standards Framework (AQTF) was published in 2001 to operationalise the ARF and also as an auditing mechanism. It continued the philosophical link to systems thinking. Standard 1 stated 'The RTO has systems in place to plan for and provide quality training and assessment across all of its operations.'

AQTF 2007 Essential Standards for Registration also used the language of systems thinking. The introduction stated 'AQTF 2007 focuses on the quality of services and outcomes being achieved for clients rather than the inputs used to get there.... AQTF 2007 places the focus of quality assurance squarely on training and assessment, client services and management systems'.

Two core concepts of systems management were also explicitly added as requirements in AQTF2007. An RTO was expected to implement management systems and also be able to provide evidence of continually improving operations.

AQTF 2010 continued with these themes and increased emphasis on the client as the major focus of the feedback loop. The Standards of the National Regulator (SNR) mirrored AQTF 2010; hence the flavour of systems thinking that was inherent in this legislation.

Systems thinking can also be applied to the wider VET context. Registered training organisations, government regulators, Service Skills Organisations, government advisory bodies and professional VET networks are all interdependent and interrelated sub-systems in the more complex system known as the VET sector. The VET sector itself is a sub-system in a larger more complex system known as the Education and Training industry. This perspective may help explain the non-linear change that is a constant feature of the VET landscape.

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