A 2-day Systems Thinking Open Course - Detailed Content

Systems Thinking is seen as the approach to handling the complexity and risks associated with business problems and opportunities in the modern world. The adoption of Systems Thinking provides a very powerful framework for understanding complex situations and issues; leading ultimately to their resolution. Its applicability is universal, from designing a new product or service through to root cause analysis of problems, managing transformation and change and the exploration and evolution of future strategies.

Applying Systems Thinking, however, requires not only skills and knowledge but also a profound understanding of the underlying systems principles. Systems Thinking is as much about mind-set as it is about process and tools. Education and training are therefore critical to the development of an organizational capability in Systems Thinking. This course aims to educate and train participants in the practical application of Systems Thinking. It presents a methodology for Systems Thinking together with simple tools to enable us to "Systems Think".

Opposite is the block plan agenda for the 2-day Systems Thinking Open Course.

Details about each session can be found in the following table that outlines:

Session Purpose
Session Outcomes
Session Content
Session Exercises and Activities

The learning approach is based on the Kolb learning cycle with a significant proportion of the course set aside for exercises to reinforce the learning. Indeed, many of the small group exercises involve a case study that provides a practical focus for the course and enables the delegates to practise the methodology and tools presented.

Day 1

0830

Aims, Objectives and Agenda Expectations

1000

The What and Why of Systems Thinking

1100

Systems Theory – The properties and Characteristics of a System
- Emergence
- Purpose
- Context
- Behaviour

1200

1300 Lunch

Doing Systems Thinking
Spray Diagrams
Multiple Cause Diagrams

1400

1500

Systems Thinking in Practice
Unified Systems Methodology

Intro to Systems Thinking Tools

1600

System Purpose:
- 18 Words
- Tree Diagrams

1700

Day 2

Review and Summary of Day 1

System Purpose:
- Quad of Aims

System Boundary
- System Map
- Input-Output Diagram

System Behaviour/Structure
- Influence Diagram
- N^2 Analysis
- Matrix Diagram

Lunch

System Behaviour
- Sequence Diagram

Exploring Choices:
- Morphological Box
- Decision Matrix

Using Systems Thinking
To understand a complex situation
Fixing problems
Creating Systems

A 2-day Systems Thinking Open Course - Detailed Content

Times	Session Name	Purpose	Outcomes	Content	Exercises
15 min	Introduction	To introduce the Course in terms of: • Aims and objectives • Agenda • Assessment • Administration	Participants: • Are told the Course aims and objectives and how they contribute to the programme aims and objectives • Are told the Course agenda, assessment and administration details	Course Aims & Objectives with links to the programme aims & objectives Course Agenda Administration details	None
30 min	Delegate Expectations	To describe and practise the use of a Quad of Aims as a tool for capturing SMART statements of purpose. To capture the participants expectations for the course.	Participants: • Can create a Quad of Aims. • Recognise the utility of the Quad of Aims tool. • Have expressed and presented their expectations for the Course.	Quad of aims description and exercise	Individual Quad of Aims for Course expectations. Small group Quad of Aims for course expectations with presentation and feedback
10 min	Learning Review	To introduce the review and reflect aspect of the Kolb learning cycle and how it can impact on the ability to retain knowledge.	Participants: • Understand the use of review and reflection as a key element of learning • Review the use of the Quad of Aims.	Kolb learning cycle Review approaches Review exercise	Participants reflect on the use of a Quad of Aims and identify an opportunity for its use

75 min	The What and Why of Systems Thinking	To explain the need for Systems Thinking as a consequence of complexity and the increasing occurrence of undesirable emergent behaviour.
		
		To explain what Systems Thinking is and its concept of application.
			Participants:
			• Understand the concept of emergence and how it is both wanted and unwanted
			• Understand the impact of:
			  o Complexity
			  o Organization – physical and procedural
			  o Mind-set – both individual and corporate
			• Have had explained the concept of Systems Thinking
			• Understand the relationships between Systems Thinking, Systems Approaches and Systems Engineering
			• Have had explained that it is based on the concept of a system and therefore a sound understanding of Systems Theory is desirable and essential
				Emergent Behaviour exercise to introduce the concept of emergence.
				Desirable vs. undesirable emergence and the link to complexity.
				Complexity Exercise
				Organization Exercise
				Mind-set Exercise
				Systems Thinking as the approach to handling complexity – cf. reductionism
				Systematic and repeatable Systems Thinking = Systems Approach.
				Systematic and repeatable Systems Thinking applied to the design, realisation, operation and support of a system = Systems Engineering
					"Helium" Tube – emergence (10 min)
					
					4-sentences – complexity (10 min)
					
					"Helium" tube organization exercise (10 min)
					
					Mind-Set exercise (5 min)

A 2-day Systems Thinking Open Course - Detailed Content

Times	Session Name	Purpose	Outcomes	Content	Exercises

120min	Systems Theory – the properties and characteristics of a System	To provide the theoretical underpinning of Systems Thinking by elucidating and demonstrating the properties and characteristics of a system	Participants:
			• Understand and appreciate the key systems properties and characteristics:
			  ○ Emergence
			  ○ Purpose
			  ○ Context
			  ○ Behaviour
				The properties and characteristics of a system
				• Components, Holism, Emergence
				• Purpose
				• Context
				  ○ Boundary
				  ○ Environment
				  ○ Need
				  ○ Viewpoint
				• Behaviour
				  ○ Events, Patterns and Structure
				  ○ Systems within Systems
				  ○ Feedback, Delays and Stability
				  ○ Stocks and Flows
					Purpose exercise (15 min)
					
					Context Exercise (15 min)
					
					Win as Much as you can exercise (20 min)

60 minutes	Doing Systems Thinking	• To show how the use of diagrams can aid Systems Thinking
		• To introduce one of the Systems Thinking meta-processes – Divergent & Convergent Thinking
		• To describe and practise using two Systems Thinking tools
		  ○ Spray Diagram
		  ○ Multiple Cause Diagram
			Participants:
			• Understand the power of diagramming in Systems Thinking
			• Recognise the benefit of teams to do Systems Thinking
			• Experience and understand the meta-process of Divergent and Convergent Thinking
			• Have practised using two key Systems Thinking tools
				The power of Diagramming to show interconnections and structure
				Divergent and Convergent Thinking meta-process
				Spray Diagram as a tool for Divergent Thinking
				Multiple Cause Diagram as a tool for Convergent Thinking
				Signed Multiple Cause Diagrams (Causal Loop Diagrams) to explore emergent behaviour
					Spray Diagram Exercise (20 minutes)
					
					Multiple Cause Diagram Exercise (35 minutes)

60 min	Systems Thinking in Practice	To introduce:
		• Repeatable Systems Thinking as a Systems Approach
		• The Meta-Processes
		• Soft Systems and Hard Systems Approaches, System Dynamics Approach
		• The Unified Systems Methodology
			Participants:
			• Understand that in certain circumstances it is possible to put a "process" into Systems Thinking
			• Introduced to the three meta-processes
			  ○ Divergent & Convergent thinking
			  ○ Plan Do Check Act
			  ○ Problem Solving
			• Introduced to:
			  ○ Hard and Soft Systems Methodology
			  ○ Systems Dynamics Methodology
			  ○ Unified Systems Methodology
			• Understand that Systems Thinking can be aided by people working together and the use of Tools
				Systems Approaches and repeatable Systems Thinking
				Soft and Hard Systems Methodologies
				The four types of situation:
				• Painting by numbers
				• Movie
				• Quest
				• Foggy
				Limitations of applying the hard and soft methodologies
				A Unified System Methodology for Systems Thinking
				Importance of People, Process and Tools to Systems Thinking
					Type of Project (30 min)
					
					Team Working (10 min)

A 2-day Systems Thinking Open Course - Detailed Content

Times	Session Name	Purpose	Outcomes	Content	Exercises
15 min	Introduction to the Systems Thinking Tool Box	To introduce the Systems Thinking Tool Box and how it is used within the Unified Systems Methodology To introduce the behaviours of a systems thinker	Participants: • Have a road map for the application of the tool set and the teaching approach • Appreciate the behaviours of a systems thinker	How the Systems Thinking tool set maps to the Unified Systems Methodology Systems Thinking behaviours: • Open minded • Tenacious • Brave • Options before solutions • Evidence based	None
120 min	Tools to explore System Purpose	To explain and practise the use of a number of Systems Tools to explore and define purpose	Participants: • Recognise the need to explore purpose from several directions to obtain a sound understanding of system purpose • Have practised using a number of simple tools to explore and define system purpose • have reflected on the application of the tools in their work	The Tools: • 18 Words • Affinity and Tree Diagrams • Quad of aims Using the tools to gain understanding	18 Word Exercise (20 min) Affinity and Tree Diagram exercise (40 min) Quad of Aims (20 min)
60 min	Tools to explore what's inside what's outside	To explain and practise the use of a number of Systems Tools to explore and define what is inside the system and what is outside.	Participants: • Recognise the need to explore from several directions to obtain a sound understanding of what is in the system and what is outside (the system of interest) • Have practised using a number of simple tools to explore and define the system of interest • Have reflected on the application of the tools in their work	The Tools: • Input-Output Analysis • System Map • Multiple Cause Diagram Using the tools to gain understanding	Input-Output Analysis Exercise (25 min) Systems Map Exercise (20 min)
80 min	Tools to explore internal structure and dependencies	To explain and practise the use of a number of Systems Tools to explore and define the internal structure and dependencies of a system of interest.	Participants: • Recognise the need to explore from several directions to explore and define the internal structure and dependencies of a system of interest. • Have practised using a number of simple tools to explore and define the internal structure and dependencies of a system of interest. • Have reflected on the application of the tools in their work	The Tools: • Influence Diagram • N^2 Analysis • Matrix Diagram Using the tools to gain understanding	Influence Diagram Exercise (20 min) N^2 Analysis Exercise (20 min) Matrix Diagram Exercise (20 min)

A 2-day Systems Thinking Open Course - Detailed Content

Times	Session Name	Purpose	Outcomes	Content	Exercises
60 min	Tools to explore system behaviour	To explain and practise the use of a number of Systems Tools to explore system behaviour	Participants: • Recognise the need to explore from several directions to explore system behaviour. • Have practised using a number of simple tools to explore system behaviour • Have reflected on the application of the tools in their work	The Tools: • Sequence Diagram • Multiple Cause Diagram Using the tools to gain understanding	Sequence Diagram Exercise (30 min)
10 min	Tools to Explore System Context	To explain and practise the use of a number of Systems Tools to explore and define system context	Participants: • Recognise the need to explore system context from several directions to obtain a sound understanding • Have practised using a number of simple tools to explore and define system context • Have reflected on the application of the tools in their work	The Tools: • Input-Output Analysis • Systems Map • Multiple Cause Diagram Using the tools to gain understanding	Tools already practiced
60 min	Tools to explore choices and decide	To explain and practise the use of a number of Systems Tools to explore choices and decide	Participants: • Recognise that Systems Thinking enables understanding that often results in change • Recognise that there is always choice and the systems approach is to identify the choices before deciding • Have practised using a number of simple tools to explore choices and decisions • Have reflected on the application of the tools in their work	Reflection on the purpose of Systems Thinking and that it often leads to change. The need to explore options before deciding. The role of creativity in generating options – but require a holistic approach. Barriers to creativity. Use of creativity tools: • Brainstorming • Affinity Diagrams, Organizing creativity through Morphological Analysis • Morphological Box Decision making and decision tools	Morphological Box exercise (20 min) Decision Matrix (15 min)
60 min	Using Systems Thinking and summary	To show how Systems Thinking can be put into practice using the Unified Systems Methodology	Participants: • Understand that the Unified Systems Methodology is a framework for Systems Thinking and that you still have to do the thinking • To show how it can be applied to problem solving and to system creation	Using Systems Thinking: • To understand • To see if there is a problem • To see if there is an opportunity • To solve problems • To create new systems Tips for using Systems Thinking to solve problems Creating systems using Systems Thinking	Personal Action Planning (20 min)