Review of "Tools for Complex Projects"

The authors suggest that "We are not very good at managing complex projects, much less understanding how they behave." Projects can have multiple dimensions of complexity; and, there is no one single means to manage that complexity, because it is affected by contextual challenges.

The book is based on research and literature review intended to establish the characteristics that predominate across complex project types, categorize those characteristics into project types and identify those practices most likely to help manage complexity in each type of project.

This is a great reference resource, a supplement to case studies, that proposes a systems thinking approach to resolve project complexity by providing a set of (qualified and agreed upon) practices, methods and analytical approaches that allow individual project managers and program offices to formulate adaptable management frameworks.

Structure of Book:

- Introduction to what makes projects complex, and how to manage complexity

- Sources of complexity

- Characteristics of complex projects

- The four types of complex projects

- Methods and practices to manage complexity

Below you will find the notes I'd extracted for my own benefit.

I found the style that the information is laid out particularly useful. The chapters on Types of Projects include how they are explained in terms of complexity, the PM challenges that arise, traps and consequences, and references and further reading.

The guide to the tools includes a discussion on relationship between theory, methodology, and tools.

Tools proposed include Mapping Complexity, System Anatomy, Target Outturn Cost, Programme Tool, Role Definition, Jazz (Time-Linked Semi Structures), Multimethodology in Series, Multimethodology in Parallel, Virtual Gates, Risk Interdependencies, Temporal Cost/Time Comparison, Kokotovich Triad, Stanislavski's Method, and Discursive Universe.

What Is A Complex Project

It is recognized that projects are systems. Yet, hard systems thinking (which works well in mechanical systems) will not resolve issues that arise in systems that depend on people as key elements–because of the unpredictability of their behavior. So, project methodologies cannot be founded on control systems thinking alone.

"In order to deliver satisfactory outcomes, project managers need to adopt both a systemic and a pluralistic approach to practice."

A New Approach

The book draws its approach from Systems Theory, emphasizing the value of collaboration in project success. It advises project stakeholders to adopt a systemic pluralism attitutude, to develop sensitivity to project collaboration needs.

Aim Of The Book

This book is a guide, not a prescriptive approach. The purpose of the authors is to provide a reference to a collection of tools and practices they have assessed from various sources to be the best strategies that can be adopted under a flexible project lifecycle framework to manage implementation (or integration) complexity.

A Complex Project Is A Complex Adaptive System

A project is not complex because of its size or scope but because of the degree of inter-relatedness in its components.

The authors propose that principles of Complexity Theory (which enquires into the nature of complex adaptive systems) can be used to identify the types of systemicity inherent in a project to formulate methods to minimize or eliminate risk.

A single project can exhibit various types of systemicity.

Based on Williams (2002) and Baccarini (1996), they conclude that all projects exhibit attributes of:

1. interconnectedness
2. hierarchy
3. communication
4. control and emergence

Sense-making goal is to find an opportunity to advantage–without having all the facts, within a certain degree of "accepted ambiguity" (based on an individual point of view).

Managing complexity requires stable relationships.

Systems reflect repeatable patterns; so, even if they are complex projects, policies can be established to manage risk.

Characteristics of Complex Adaptive Systems

Hierarchy - nested systems (work breakdown structures and process models)

Communication - formal and collaborative (central) communication tools

Control - rules of engagement to ensure undisrupted continuity

Emergence - properties that only arise at a particular state of interaction

Phase Transition - new conditions can result in the need to adapt to a different set of properties

Non-linearity - caused by positive feedback (demand) inducing change... group members need positive feedback to produce creative and successful solutions

Adaptiveness - ability of the group to revisit its improvement objectives based on arising or observed conditions... phased implementations require a flexible integration framework

Sensitive Dependence on Initial Conditions - seemingly unimportant anomalies in initial conditions can cause unexpected (and undervalued) risks

Types of Project Complexity

Recognizing the type of complexity aids to select the right tools and approaches to manage the project.

The source of project complexity will influence the project lifecycle's:

1. critical review points
2. length of project phases
3. governance structure
4. selection of key resources
5. scheduling and budgeting
6. ways of managing risk

It will also affect the choice of

1. procurement method, and
2. approaches to contract management

The four types of complexity generally agreed upon are:

1. Structural – very large projects, with lots of interconnected activities and tasks

2. Technical – tech or design problems associated with products never produced before or being produced with new techniques, with multiple interdependent solution options

3. Directional – unshared goals and, unclear meanings, hidden agendas; challenges arise in managing the critical design phase, negotiating resources, and managing expectations of key stakeholders

4. Temporal – the Fukuyima type: shifting environmental and strategic directions outside of the control of the project team, creating uncertainty about future constrains, expectations of change and even the survivability of the program/system. Paranoia is an issue. Relates to change in external influences over time and may happen at any time during project lifecycle

Tools[1] to Manage Project Complexity

Tools proposed include Mapping Complexity, System Anatomy, Target Outturn Cost, Programme Tool, Role Definition, Jazz (Time-Linked Semi Structures), Multimethodology in Series, Multimethodology in Parallel, Virtual Gates, Risk Interdependencies, Temporal Cost/Time Comparison, Kokotovich Triad, Stanislavski's Method, and Discursive Universe.

1. Mapping Complexity – a simple way to illustrate where the sources of complexity are likely to occur and how they change throughout the project life cycle

2. System Anatomy – an approach developed for the telecommunications industry which involves simple graphic means of coordination between international centres

3. Target Outturn Cost – an approach developed for construction projects based on collaborative working agreements

4. Programme Tool – a concept which uses the programme to help define differential strategies for managing projects within the programme according to their type and level of complexity

5. Role Definition – a checklist for use when defining role capabilities for managing different types of complex projects

6. Jazz (Time-Linked Semi Structures) – a way of thinking about the organisational structure for a complex project in order to balance creativity and output

7. Multimethodology in Series – an approach which grafts soft systems thinking to the front end of a project or project phase

8. Multimethodology in Parallel – an approach which embeds soft systems thinking into the project throughout the entire project life cycle

9. Virtual Gates – an approach which utilizes the idea of variable control gates to help manage project risk

10. Risk Interdependencies – a quick tool to help identify emergent risk patterns in small- to medium-sized projects

11. Temporal Cost/Time Comparison – an approach to preparing realistic ranges of estimates during uncertainty

12. Kokotovich Triad – a group of tools to assist in stimulating creative solution finding

13. Stanislavski's Method – a tool to help expand personal perspectives in a given situation

14. Discursive Universe – a tool to help wih communication and managing difficult stakeholder relationships

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[1] Curiously, most of the tools focus less on communication than on managing people's expectations and resolving resource output agreements. Accelerated estimations (which have always been the norm) can lead to poorly considered timelines that force people to have to resolve the gap between the present demands against earlier promises of engagement. The tools are intended to seek clarity towards a more firm compromise of resources.

Chapter	Title	Type of complexity				When to use	
		Structural	Technical	Directional	Temporal	Life cycle	Ad hoc
8	**Mapping the Complexity** – a simple way to illustrate where the sources of complexity are likely to occur and how they change throughout the project life cycle.					X	
9	**System Anatomy** – an approach developed for the telecommunications industry which involves simple graphic means of coordination between international centres.					X	
10	**TOC (Target Outturn Cost)** – an approach developed for construction projects based on collaborative working agreements.					X	
11	**Programme Tool** – a concept which uses the programme to help define differential strategies for managing projects within the programme according to their type and level of complexity.					X	
12	**Role Definition** – a checklist for use when defining role capabilities for managing different types of complex projects.					X	X
13	**Jazz (Time-linked Semi-structures)** – a way of thinking about the organisational structure for a complex project in order to balance creativity and output.					X	

Table 7.1   Summary of tools chapters

Chapter	Title	Type of complexity				When to use	
14	**Multimethodology in Series** – an approach which grafts soft systems thinking to the front end of a project or project phase.					X	
15	**Multimethodology in Parallel** – an approach which embeds soft systems thinking into the project throughout the entire project life cycle.					X	
16	**Virtual Gates** – an approach which utilizes the idea of variable control gates to help manage project risk.					X	
17	**Risk Interdependencies** – a quick tool to help identify emergent risk patterns in small- to medium-sized projects.						X
18	**TCTC (Temporal Cost-Time Comparison)** – an approach to preparing realistic ranges of estimates during uncertainty.						X
19	**Kokotovich Triad** – a group of tools to assist in stimulating creative solution finding.						X
20	**Stanislavski's 'Method'** – a tool to help expand personal perspectives in a given situation.						X

...t Using Earned Value. (Sydney, Australia: Standards

...Guide To Earned Value Project Management. (Vienna, VA:

...Using Collaborative Working Arrangements in the ...P VII Conference (Xi'an, China: Northwestern Technical

...rom the Construction Taskforce (London, UK: HMSO). ...es to Hawkins Construction Ltd. (Christchurch, NZ.) ...nism Workshop. (Remuera, Auckland, NZ: Collaborative

...eport of the Government / Industry Review of Procurement ...on Industry (London, UK: HMSO). ...ard For Earned Value Management, (Newtown Square,

...'s Guide. (Aldershot, UK; Burlington, VT, USA: Gower

11 Programme Tool

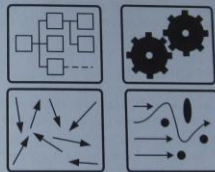|	
Time to use:	An approach which informs the entire project
Level of difficulty:	Use by an experienced practitioner
Group:	Involves the whole project team and key senior stakeholders
Types of complexity suited for:	

Problem

Most large projects are too big to be managed as a single project by a single person or group.

Purpose

The aim is to break down the large project into smaller manageable units to make it possible to address the source and level of complexity of each unit separately. By monitoring the whole group of units in relation to the environment and the strategic goals of the programme,