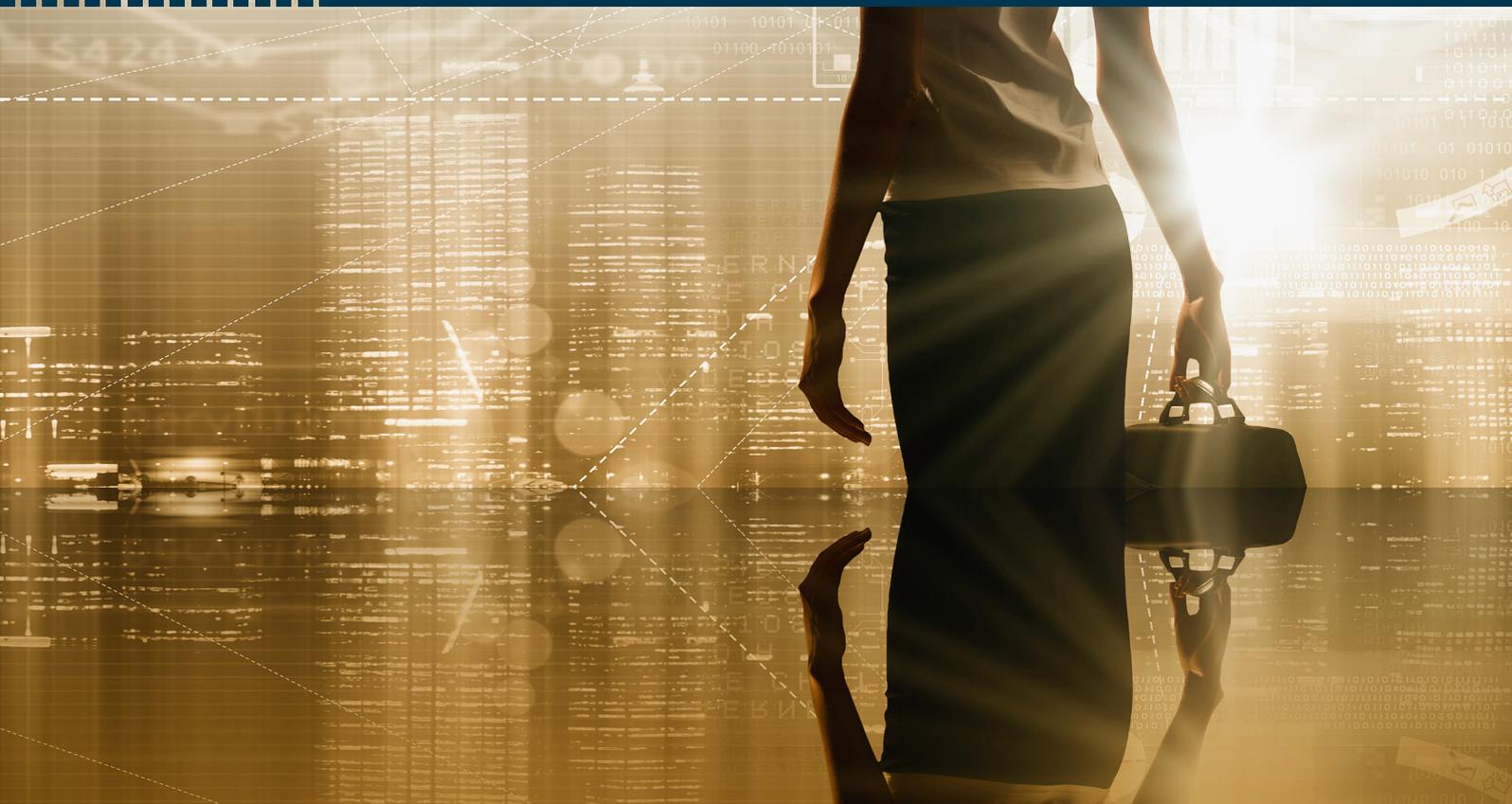




Harnessing Emergence in Complex Projects



Risk, Uncertainty and Opportunity

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Executive Summary

This report is structured into four distinct parts. Part 1 introduces the background and impetus for the topic, parts 2 & 3 provide a detailed philosophical and theoretical exploration of the topic and part 4 provides practical guidance for building capability, capacity and competence for harnessing emergence in complex projects.

Part 1- Introduction - The Persistent Experience of Emergence in the World and in Complex Projects: COVID-19 has been the defining emergent event through 2019 and 2020 including up until the date of this publication in late 2021. Clearly, the emergence of COVID-19 has created volatility everywhere as well as uncertainty about what to do and what comes next. Moreover, responding to it is complex and our understanding is clouded in ambiguity and constrained understanding. This has presented us with a complexity related case study with challenges that draw attention to a range of issues including boundaries, interconnectedness, emergence, resilience, and unintended consequences.

Projects and programs have not been immune to these impacts as emergence occurs at all levels of structure and this report explores how project leaders might harness emergence in complex projects and captures the insights of conversations from the roundtable series.

Over the life of the ICCPM Roundtable Series to date and including in this one, participants have brought with them a variety of approaches and practices, a range of different experiences, and a diversity of views around complexity. However, common to all appears to be an experience of the 'unexpected'. Some judge the unexpected as positive (opportunity) and some as negative (risk). Importantly, the positive/negative judgement is relative to a range of factors relating to emergence that are explored in this report. Additionally, traditional risk management in conventional project theory and practice can influence our perceptions and consequently, our risk responses are often inadequate and insufficient – either in terms of form and /or function.

Part 2 - How Worldview and Paradigms Shape How We See, Understand and Deal with Emergence in Complex Projects: In this part of the report, we argue that worldview determines how we view the role of people in complex projects and whether people see the plurality of uncertainty, risk, and opportunity inherent in a situation or problem context as something created or simply expressed. Therefore, harnessing emergence in complex projects is dependent on worldview. We explore a theoretical framework to illuminate four different worldviews and paradigms; *Positivism, Critical Theory, Constructivism, Postmodernism* and introduce ways in which these different worldviews influence our view of complexity and how this may apply to complex projects including *Control, Narratives, Storytelling, Scepticism, Sensemaking, Knowledge, and Collective Thinking*.

With four different paradigms, project leaders are left with a choice – to adopt a singular paradigmatic approach to the leadership of complex projects or develop a practice that is multi-paradigmatic.

Paradigms are useful heuristics through which we can make-sense of different worldviews in terms of their ontological and epistemological distinctions. Because worldviews are complex, and they constitute a significant factor in our approach to complexity and emergence. Furthermore, appreciating them according to their relevant paradigm can promote deeper understanding of

difference and an increased appreciation of the importance of diversity in our response to complexity. In human activity systems, the boundaries we create around ourselves and others as well as around our projects and priorities are artificial at best and problematic at worst.

A multi-paradigmatic appreciation of projects assists leaders of complex projects understand the dynamics of power, the mechanism of control and the appropriate inclusion of scepticism. It also enables a deeper understanding of the roles that narrative, and storytelling play in the various processes of meaning and purpose making within projects. In terms of complexity, sensemaking and collective thinking are constructivist responses that promote adaptation, resilience, and system capacity.

Fortunately, pragmatism offers an overlay approach that is grounded in theory as well as practice. In an attempt to 'acknowledge, rather than reduce, the complexity of the world', pragmatism offers an approach to action that is useful and grounded in a relational and dynamic view of human agency. Pragmatism is contingent, critical, and situational. It recursively combines the ontological and epistemological approaches to complexity, and it does not separate thinking, meaning, or acting. Pragmatism offers project leaders a multi-paradigmatic and practice-based approach that leverages diverse and fit-for-purpose action in complexity.

Part 3 – Approaches to Emergence in Complex Projects: In this part of the report, we explore roundtable dialogue which highlighted that our approach to uncertainty, risk and opportunity is determined by our subsequent approach to emergence. In this section we unpack a useful understanding of emergence (weak and strong) including exploring various elements of emergence such as *Purpose and Recursion, Boundaries, Planning and Control, and Causation*. We argue that there are different zones of emergence each with their own implications on how we might respond to uncertainty, risk, and opportunity. We propose a 'Zones of Emergence' framework as a way of understanding an approach to how we view uncertainty in various situations as part of the larger context in which risk and opportunity is situated.

The framework explores a range of sensemaking situations ranging from no emergent phenomena to weak emergence to strong emergence. Emergent phenomena begin with Zone 1 which is the home of traditional Project/ Risk Management where risk registers are used to manage tangible, measurable or well-defined risks, so called 'known' potential risks and their 'known' mitigations. Quantitative measures based on probability are relevant and useful in this zone. In this zone risk is dealt with in a rational, linear process of identification and treatment.

Zone 2 is the zone of blind spots where projects are exposed to unknown tangible, measurable or otherwise well understood uncertainties because of gaps in knowledge or research. However, these unknowns are discoverable (knowable) through expert input and /or surfacing techniques which can make these factors known to the project risk and decision-making leadership.

Zone 3 is the zone of strong emergence where project leaders may face unknown unknowns and where such vulnerabilities are undiscoverable in advance. This is because truly emergent risks are simply not discoverable until they begin to emerge. Since emergence in this paradigm implies a time and relational component, an emergent uncertainty may be present now or yet to emerge. This distinction is important because until an emergent property is actually present, the risk is unknowable. Once it is present, the risks are always knowable. This is the domain of 'weak signals' where obliquity or attentive intelligence is required.

Finally, we suggest that rather than approaching risk management from a control perspective in order to mitigate the negative impacts it may be better, in certain circumstances, for example in complex environments, to approach uncertainty from a 'harnessing of emergence' perspective.

Part 4 - Harnessing Emergence in Practice: A project leader's guide to building the capabilities, capacity, and competencies required: In this part of the report, we translate the underpinnings of the preceding sections into practical insights and options for leaders in complex project environments. In particular, this section focuses on the capabilities, capacity, and competencies required of effective projects when viewed as human activity systems, for them to be able to harness emergence in practice.

We consider the attributes required for building capability to harness emergence; *capable people, leadership in uncertainty, a systems approach to governance, discourse and connectivity, application of systems thinking, culture (and associated behaviours), readiness, and agility*. Using these attributes and five underlying capability themes, we offer a capability map of the inter-dependent attributes of a project system where harnessing emergence is itself an emergent outcome.

In complex fast-moving environments the core overall attribute is not 'capability' at any point in time, but rather 'capability-agility'. Leaders who enhance the ability of their project to quickly and proactively adapt, are developing its ability to 'harness emergence'.

Insight from Roundtable dialogue indicate four practical strategies that if applied in concert have the potential to transform:

- Implement systemic governance arrangements
- Invest in recruiting/acquiring appropriate fundamental capabilities
- Invest in Complex Project Leadership (CPL) education and training
- Over time, develop capability-agility maturity

Furthermore, we suggest that responding to and harnessing emergence requires project organisations to build the ability to recognise, respond and adapt to emergent phenomena which is referred to as 'absorptive capacity'. We propose practical steps for improving absorptive capacity which include:

- Identify Boundary Spanners- Identify and develop those people in the organisation and project team who can play the role of boundary spanners.
- Identify Gatekeepers - Identify people who are gatekeepers, individuals who control access to knowledge and connect them with the boundary spanners.
- Proactively use boundary objects- Boundary objects can be used to improve moving knowledge across boundaries by unifying common knowledge necessary for absorption.

Finally, we include some key competencies for harnessing emergence based on Roundtable dialogue which include managing *multiple perspectives, thinking and knowing, crossing boundaries, engaging in continuous discourse, and building trusted relationships and psychological safety* as examples of skills and competencies that are necessary to harness emergence in complex projects.

