

Using Strategic Foresight to Improve Future Readiness of Project Management

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Abstract

Project management is a strategic capability in organizations to adopt appropriate processes, structures, and practices now and in the future to improve performance and future resilience and flexibility. At present, there are methodologies for the assessment of present project management capabilities in organizations such as Capability Maturity Models. There are several trends and challenges that organizations are facing which will likely affect the capabilities that will be required for project management in the future. The approach adopted for the research was to conduct a strategic foresight methodology analysis to lay a foundation from which to develop a 'future readiness model' for project management. The future-readiness model is suggested to be a project management capability model which will allow organizations to:

- Evaluate the current capabilities using existing models
- Assess future capabilities required from a future readiness model
- Establish gaps for action to become future-ready

The research methodology consisted of a literature review of relevant academic and business articles and reports over the past 20 years, using an inductive qualitative approach, of project management capability models, future thinking, future trends, and challenges. The findings of the literature review indicate that methodologies for the assessment of present project management capabilities in organizations are well-researched. However, strategic foresight methodologies applied to understanding what future capabilities are required by organizations in project management are generally not researched and are an important gap in the literature. These findings imply that strategic foresight methodologies such as scenario planning can improve key areas such as strategic thinking, decision-making, and risk management for improved performance, future resilience, and flexibility. In conclusion, it is proposed that a future readiness capability model for project management should be researched and developed. This is particularly important as major trends are changing the way project management will be done in the future, such as the increasing adoption of emerging technologies including machine learning and knowledge-based systems based on artificial intelligence.

Keywords: *Capability model, Strategic foresight, Challenges and trends, Future resilience, Future skills, Emerging technologies, Future readiness model*

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1. Introduction

Project management is a strategic capability in organizations to adopt appropriate processes, structures, and practices now and in the future to improve performance and future resilience and flexibility.

At present, there are methodologies for the assessment of present project management capabilities in organizations such as Capability Maturity Models. There are several trends and challenges that organizations are facing which will likely affect the capabilities that will be required for project management in the future.

The approach adopted for the research was to conduct a literature review to lay a foundation from which to develop a 'future readiness model' for project management. Project management strategic foresighting provides a link between present project management capability and future readiness for organizations. A proposed future readiness capability model can be developed from the results of the strategic foresight analysis. The future-readiness model is suggested to be a project management capability model which will allow organizations to:

- Evaluate the current capabilities using existing models
- Assess future capabilities required from a future readiness model
- Establish gaps for action to become future-ready

The future-readiness model should provide organizations with access to trends driving change in project management, and the opportunities and challenges that need to be addressed in the future to have an effective project management process tailored to their strategic circumstances. This will allow organizations to identify capability gaps that need to be filled to contribute to the future resilience of organizations and their ability to cope with uncertainty and adapt to change.

The literature review is aimed at identifying, summarising, and categorizing relevant literature from published academic and business sources related to three aspects of project management:

- Identify and describe the commonly used capability models to evaluate an organization's current project management capability.
- Identify commonly used future thinking methodologies and evaluate their use in project management. These methodologies should allow organizations to understand the changes that are likely to occur in the future, which they can then respond to in the present.
- Identify, describe, and categorize future thinking content from future thinking methodologies such as project management trends, opportunities, and challenges.

The objective of this research is to investigate and assess whether a future capability readiness model for project management is required by organizations based on current literature and theoretical models. The major research question that needs to be tested is: Are there suitable future readiness capability models for project management currently developed and used?

2. Methods

The research method includes a literature review of relevant academic and business articles and reports over the past 20 years. The approach is qualitative and inductive with grounded theory methodology to analyze the secondary data.

This methodology allows for an understanding of what is currently known about the following topics:

- Existing project management capability models
- Strategic foresight methodologies in general and applied to project management
- Future trends, challenges, and opportunities for project management
- Resilience and flexibility in organizations and project management

This methodology fulfills the research review's main objective of understanding how strategic foresight can be used to improve performance, resilience, and flexibility, and to identify any research gaps that need to be responded to. This methodology is considered effective and is replicable due to the transparent use and analysis of publicly available secondary data over 20 years and from a wide range of relevant sources from academic and business articles and reports.

3. Results and discussion

A summary, analysis, and discussion of the literature review are discussed in this section.

3.1. Project management capability models

Based on a literature review, there are currently over 30 project management maturity models, based on the CMM maturity levels and the Project Management Body of Knowledge (PMBOK Guide) [1][2][3][4].

Many of the models are based on either (or both) of the Project Management Knowledge Areas derived from the PMBOK Guide (Project Management Book of Knowledge 6th edition [5][6], and/or the Capability Maturity Levels [7].

The 6th edition of the PMBOK Guide [6] identified 10 project management knowledge areas. Project Integration Management; Project Scope Management; Project Time Management; Project Cost Management; Project Quality Management; Project Human Resource Management; Project Communications Management; Project Risk Management; Project Procurement Management; Project Stakeholder Management. In the 7th edition of the PMBOK Guide [5], these were replaced by eight project performance domains, which include: Stakeholders; Team; Development approach and lifecycle; Planning; Project work; Delivery; Measurement; Uncertainty.

The Capability Maturity Levels are: Initial; Managed; Defined; quantitatively managed; Optimising [8].

A review of project management capability model literature identifies five well-described and used models which are generally representative of different types of models. These are as follows, and are summarised in [Table 1]:

- Project Management Institute (PMI): OPM3 (Organisational Project Management Maturity Model)
- Axelos (includes OGS): P3M3 (Portfolio, Programme, Project Maturity Model)

- Carnegie Mellon (Software Engineering Institute): CMMI (Capability Maturity Model Integration)
- Berkley University: PM2 (Project Management Process Maturity Model)
- PM Solutions: PMMM

Table 1. Description of selected project management capability models

Project Management Maturity Model	Description from selected references	References
OP3 (PMI)	OPM3 aims to integrate, assess, and improve project management practices. The model also supports organizations' development of the capabilities that strengthen the processes used to manage all projects within the organization and to relate those projects close to the corporate strategy. It provides a hierarchical structure with several best practices, each comprising multiple capabilities. Each capability leads to outcomes that can be assessed by key performance indicators and metrics. Three organizational levels; projects, programs, and portfolios are measured according to four levels of maturity: standardize, measure, control, and continuously improve [15].	[9][10][11][12][13][14][15][16]
P3M3 (Axelos)	P3M3 is an overarching model containing three individual models: Portfolio Management Maturity Model (PfM3) Programme Management Maturity Model (PgM3) Project Management Maturity Model (PjM3). P3M3 uses a five-level maturity framework, and the five Maturity Levels are: Level 1 – awareness of the process Level 2 – a repeatable process Level 3 – defined process Level 4 – a managed process Level 5 – optimized process. P3M3 focuses on the following seven Process Perspectives, which exist in all three models and can be assessed at all five Maturity Levels. These consist of: Management Control; Benefits Management; Financial Management; Stakeholder Engagement; Risk Management; Organizational Governance; Resource Management.	[17]
PMMM (PM Solutions)	The PM Solutions Project Management Maturity Model is based on a two-dimensional framework. The first dimension reflects the level of maturity [13]. The second dimension depicts the key areas of project management addressed. This dimension adopts the structure of PMI's knowledge areas [6]. Each of the knowledge areas was further decomposed into key components that provide for a more rigorous and specific determination of project management maturity.	[6][13][16]
CMMI (Carnegie Mellon University)	Most models are based on the concept that organizations advance through maturity models. These levels define an ordinal scale for measuring the maturity of an organization's process and for evaluating its process capability. The levels also help an organization prioritize its improvement efforts [12].	[9][18][10][12][14][8][15][9]

<p>PM2 (Berkeley University)</p>	<p>PM2 provides a means for identifying and measuring different project management levels by integrating nine project management knowledge areas with five project processes under a quantified scheme [19]. The PM2 provides an orderly and disciplined process to achieve higher levels of project management maturity. An example of measuring project management practices and performance is the integration of project management knowledge areas and project management phases against actual project performance data. This study is a step toward a factual and quantitative way to measure project management practices and performance [19].</p>	<p>[9][11][12] [19][20]</p>
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3.2. Strategic foresight

A review of the literature on strategic foresight methodologies indicates that foresight and scenario planning are mainly used, and these are well-known and frequently applied [21][22].

There is evidence from a literature review of foresight in project management [23] that there is value for organizations to use foresight methodologies for project management as an approach to deal with uncertainty, as foresight methodology looks into the uncertain future and assists in decision-making in the present. The survey also indicated that the link between foresight and project management is predominantly focused on early warning indicators in projects. The literature review demonstrates that foresight research in Project Management literature is still in its infancy and is characterized by a limited number of studies. The author [23] concludes that data on the relationship between project management is loose and not yet robust, strongly indicating an open path for future research. A further conclusion is that other uses of foresight such as trend analysis are 'weak or inexistent and this gap in the literature is also a reason for further research [23]. A similar conclusion has been reached about the use of scenario planning methodology in project management where more work is needed to refine a scenario planning methodology directly applicable in a project management setting [24]. The potential benefits of the use of foresight and scenario planning in project management include:

- Risk management [23][24]: The benefits of using scenario methodology for project management include more effective risk management, through adjusting the strategic plan due to scanning for indicators of fundamental changes in the overall environment in which the organization operates. Scenario planning principles include recognizing that there may be alternative futures to the desired vision, monitoring environmental variables to detect if a fundamental change is underway that could affect the successful project outcome, and using the terminology to help manage stakeholder expectations [24].
- Project team outcomes [25]: Incorporating foresight methodologies and a futures-oriented mindset in project teams convey benefits such as greater team ownership of risks and project outcomes; an improved connection between the individual, project, and organizational goals as there is a deeper understanding and appreciation among project teams of the future challenges facing the organization, and it is easier to create a common set of values across multiple project teams, and the rest of the organization; increasing the resilience of project management teams to deal with rapid change.

3.3. Potential components of a future readiness model

A summary of project management challenges, opportunities, and trends has been developed from a literature review.

1. Technology

Several surveys and reports have identified that new digital technologies are, and will continue, to impact project management [26][27][28][29][30][31][32]. These technologies will support new ways of working and have the potential to automate many areas of project management, improve performance (such as improved workflow) [38], and improve decision-making. This is particularly important as the demands of connected and digital organizations operating in a rapidly changing business environment increase [29].

PMI (Project Management Institute) identifies 6 technologies with the greatest potential to impact project management [30]. These are summarised in [Table 2].

Table 2. Summary of technologies to impact project management [30]

Technology	Description
Machine learning	Computers learn to respond humanly through the analysis of data using computational methods.
Deep learning	Data were analyzed by multilayered neural networks.
Robotic process automation	Software designed to handle basic, repetitive tasks within applications.
Decision management	Use of Artificial Intelligence to analyze data and generate possible options and outcomes.
Knowledge-based systems	Computer programs that extract data from a knowledge base and generate solutions to complex problems.
Expert systems	A computer system programmed to mimic the decision-making skills of a human expert.

The PMI survey [30] identified those enterprises which find and adopt new ways of working in areas such as project management, outpace other enterprises in the use of new technology. These technologies include cloud technologies, Internet-of-Things (IoT), Artificial Intelligence (AI), and 5G mobile internet. However, a 2019 survey [29] indicated that the use of digital technologies is lagging (for example, only 8% of organizations use AI to support project management).

With the increasing use of digital technologies, there will be a need for a greater focus on data and the use of data analytics software [27][31].

The 2019 survey [29] indicated that 71% of organizations use project management software and about half use collaboration tools to support project delivery. These tools, including cloud solutions, use software to facilitate project management areas such as cross-company collaboration, project planning, and tracking budgets and deadlines [33].

2. Change management and culture

The importance of managing change and culture alongside project management is essential for effective project delivery [26][27][29][33]. Change management needs to focus on managing the benefits and change through the project lifecycle [29]. Managing the change process within an appropriate culture to build agility and resilience requires overcoming resistance to change and allows project managers to access enterprise-wide skills and knowledge [33].

3. Risk management and governance

The 2019 survey [29] indicated that at least 40% of organizations 'never or sometimes' apply risk management methodology for project management. Organizations need to commit to stage gate governance and risk identification and escalation of risk management and apply consistent governance oversight [27][29]. The importance of project managers taking

responsibility for 'triple-bottom-line (economic, social and ecological) aspects are also emphasized [33].

4. Collaboration and knowledge sharing

Increased organizational collaboration and knowledge sharing are required to address project management challenges such as the increased use of diverse and virtual project teams, the GIG economy and part-time workers, and increased uncertainty and complexity of projects [26][27][33][34].

A supportive culture is required to encourage staff with technical and/or discipline skills and perspectives to share their knowledge and experience with others in a multi-disciplinary collaborative integrated team approach to project delivery [34]. Collaboration can also be facilitated by pairing humans with project management collaboration tools [28].

5. Training and skills development for Project and Program Managers

Project and Program Managers need to become increasingly strategic and connected and develop new skills such as change management. In the 2019 survey [29] only 28% of organizations globally had a planned development program or pathway for the development of project management skills, and only 22% of organizations run a formal graduate program and internship for project managers.

The increasing and important value of social ('soft') skills for project managers is emphasized [27][28][31][33][34]. These skills include communication, conflict management, decision-making, leadership, motivation, organization, and trust-building [31]. Social skills are required to build confidence and trust quickly, and to allow project managers to communicate, collaborate, and connect with people from diverse backgrounds [28] [34].

Project managers need to become increasingly strategic and networked and develop new skills such as change management [29].

Project managers will increasingly require the ability to understand and apply new digital technologies and tools [34]

6. Hybrid methodology

A major project management trend is the increasing use and melding of agile and traditional methodologies [27][28][30][31][33]. The implementation of agile project management methodologies enhances a traditional system (such as 'waterfall') and allows for standard management techniques while increasing flexibility and response time to sudden changes [28]. However, care needs to be taken in the selection of the right approach for every project through the use of filter and selection tools.

3.4. Why is strategic foresighting important for organizations? How can organizations build future resilience?

In exploring the role of strategic foresight, The World Business Council for Sustainable Development [35], indicates that strategic foresight can influence strategic decision-making positively by considering deeply entrenched assumptions and increasing the ability of organizations to become more flexible and resilient. Strategic foresight instigates unfamiliar conversations, develops decision-making capabilities, and tests future innovations and strategies. The World Economic Forum [36] discusses the challenges and disruptions that are occurring and that will cause future shocks such as the COVID-19 pandemic, climate change, and technological change. These future shocks will arise from risks with unknown likelihoods and impacts, and public and private institutions need to address these longer-term dynamics and build preparedness for future shocks. Organizations must embrace a futures-thinking

orientation, beginning with the current state and using foresight to lay down a path to meet estimated, yet unknown, future needs [22].

Several authors explore the effect of major changes and unanticipated risks and events on organizations and highlight the importance of project management in increasing resilience and allowing recovery from the setbacks of future shocks [37][38][39]. Adaptable and predictable project management practices and frameworks that integrate the concept of resilience help the organization manage unanticipated risks and disruptive events and recover [37][39].

An effective change management strategy to develop resilience in project management is described as follows [37]:

1. Acceptance and adaptability to unpredictable events;
2. Iterative and incremental approach for minimizing the impact of risk;
3. Establishing early and regular feedback loops;
4. Setting clear, realistic, and measurable expectations through the use of stage gates;
5. Project risk to be treated as an inherent part of the organizational change management;
6. Measuring value empirically and improving impact;

A strong project management methodology will allow the above steps to be implemented in a more sustainable manner aligning the shared vision to co-create the goals. It will include the following:

1. Revisions to the project and business continuity plans as and when needed instead of "carved-in-stone" plans;
2. Facilitating faster and more sustainable collaborative decision-making through digital tools and building cloud-based resilient solutions;
3. Delivering meaningful value in shorter iterations which is in a releasable and usable form;
4. Defining goals of each iteration and ensuring that it aligns with the overall release roadmap;
5. Risk identification through Risk Breakdown Structure (RBS) into risk topic, risk category, and risk type and prioritizing the risks for creating risk census and risk burndown chart for knowing the risk exposure across the iterations.

4. Conclusion

The literature review indicates that capability maturity models as well as strategic foresight methodologies such as foresight and scenario planning in general and for project management are well developed and researched. However, applying future thinking methodologies to identify future project management trends, challenges, and opportunities is limited and not integrated and developed into a future readiness model.

Published research into the links between future thinking methodologies such as foresight and scenario planning with project management is limited and is identified as an area for future research. There is no evidence in the literature review of the use of future thinking to assist in the development of a future readiness model for project management.\

The research conducted suggests that strategic foresight methodologies have the potential to add value to project management in several important areas which will have important implications and benefits for organizations. These implications include increasing resilience to deal with change and uncertainty, improving decision-making, and better identifying and mitigating risks. Further to this, it can support improving the ownership of outcomes, and connectivity of project teams for improved performance.

The major conclusion is that strategic foresight has the potential to help organizations cope with future shocks, uncertainties, change, and unanticipated risks. The focus on maturity helps organizations build a culture of learning and continuous improvement. This helps build agility and resilience in organizations to deal with the new normal. Future readiness is thus important to improve the performance and sustainability of organizations.

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