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Dynamic Capability through Project Portfolio Management

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Abstract

In dynamic environments, organizations must adapt to succeed. In project-based organizations, project portfolio management (PPM) can act as a dynamic capability, a strategic capability that provides competitive advantage by enabling an organization to effectively respond to change. PPM is an important organizational capability that enables organizations to manage and balance their portfolio holistically; to align projects with strategy; and to ensure adequate resourcing for projects to maximize the benefits from project investments. A dynamic PPM capability boosts organizational agility and flexibility by facilitating adjustments to the project portfolio and reallocating resources in response to changes in the environment. To remain relevant in a dynamic environment, the PPM capability itself must evolve. Examples of aspects of PPM that provide dynamic capability are outlined in this paper to provide guidance for practitioners.

Introduction

During the past two decades, project portfolio management (PPM) has become established as a discipline and organizations have increasingly turned to PPM to help them manage their portfolios of projects and improve their competitive position (Levine, 2005; Kester et al., 2011; Killen & Drouin, 2017). The primary goals of PPM adoption are to effectively implement the organizational strategy through the portfolio of projects and to enhance the long-term value of the portfolio. PPM assists with the management of resources across the portfolio to avoid a "resource crunch," where the organization attempts too many projects (Cooper & Edgett, 2003). PPM methods also provide the holistic oversight required to ensure balance in the portfolio. The link between higher success levels and the use of formal and mature PPM approaches (Cooper et al., 2001; Killen et al., 2008a) has prompted organizations to focus on the establishment and development of PPM.

PPM is often presented as a series of processes and procedures that organizations tailor to suit their environment. The common refrain has been that once tailored appropriately, the PPM process will assist an organization in achieving competitive advantage by implementing strategy, balancing the portfolio, maximizing value, and ensuring resource adequacy for projects. However, recent research highlights many other aspects of PPM that paint a picture of increased complexity and dynamism and offers insight into additional ways that PPM can create value for an organization (Killen & Hunt 2010; Petit, 2012). PPM is now seen as more than a process; PPM is an organizational capability that also includes the organizational structure, the people, and the culture. These elements must work together for effective PPM and top management support is a crucial factor in PPM capability success. Recent studies also indicate that PPM has a significant role to play in helping organizations achieve advantages in dynamic environments, and that the PPM capability itself needs to evolve and

adjust to enhance organizational agility and contribute to sustainable competitive advantage (Killen & Hunt, 2010, Sicotte et al., 2014, Killen & Drouin, 2017, Saeed et al, 2021).

This paper first introduces PPM concepts and outlines typical processes before discussing the additional challenges for PPM in dynamic environments. To guide practitioners, several examples are presented to illustrate aspects of PPM that help organizations respond to change and improve organizational outcomes.

PPM Concepts

As many organizations shift to "management by projects," projects are often the main vehicle for delivering organizational strategy. Definitions of PPM have evolved as the discipline became established. A widely accepted definition of PPM developed by Cooper et al. (2001, p. 3) is that: "Portfolio management … is a dynamic decision process wherein the list of … projects is constantly revised. In this process, new projects are evaluated, selected, and prioritized. Existing projects may be accelerated, killed, or deprioritized and resources are allocated and reallocated." McDonough and Spital (2003, p. 40) point out that PPM is more than project portfolio selection as it also involves the "day to day management of the portfolio including the policies, practices, procedures, tools and actions that managers take to manage resources, make allocation decisions and ensure that the portfolio is balanced in such a way to ensure successful portfolio-wide new product performance." Levine (2005, p. 22) offers a broad definition of PPM: "Project portfolio management is the management of the project portfolio so as to maximize the contribution of projects to the overall welfare and success of the enterprise." An organization's capability to manage the project portfolio encompasses much more than the processes and methods identified for PPM, it also requires the people and a culture that support information transparency and portfolio-level

perspectives, and it requires organizational structures that provide appropriate levels of visibility and responsibility to support the PPM capability (Killen & Hunt, 2010). In addition to delivering strategy, dynamic PPM capabilities contribute to the evolution of strategy through a two-way interaction between the projects and the strategy. Project portfolio perspectives provide the impetus to update strategies to reflect dynamic environments and to recognize the emergence of bottom-up strategies (Kopmann et al., 2017; Kaufmann et al., 2020).

Although PPM needs to be tailored for each organization, there are many common elements and approaches to PPM. In its simplest form, PPM facilitates decisions across the entire portfolio of projects by collecting information from all the projects (both existing and proposed); collating and organizing the information; presenting information to a carefully selected decision-making team for portfolio-level review; and providing a structure for communicating and implementing decisions. These four steps are explained with extensions for dynamic environments in the section *Outline of a Dynamic PPM Approach*.

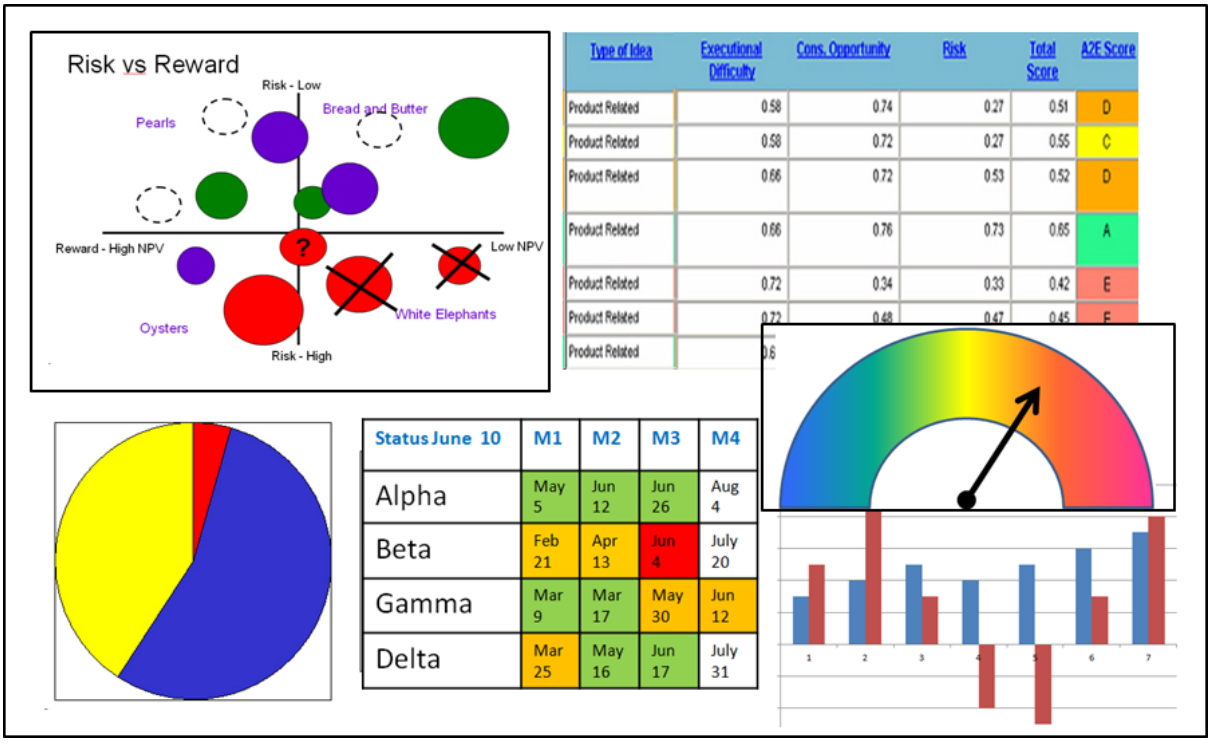

Figure 1. Typical Methods for Organizing and Presenting PPM Data

Figure 1 illustrates a range of common methods and tools for organizing and presenting portfolio data in a visual format, including (clockwise from top left) risk versus reward portfolio map, scoring model, dashboard display, stoplight report, and pie chart. Portfolio mapping is a common method to provide a central view of all projects in the portfolio to support decision-making. Portfolio maps plot projects on two axes and can assist with the selection of a balanced portfolio of projects. Commonly used portfolio maps balance aspects such as risk versus return and can also display other information through the size, color, patterns, or notes associated with the symbol for each project. Scoring models use weightings and ratings to compare projects based on multiple criteria. Many software applications for PPM offer "dashboard" displays that show the status of projects on dials and graphs. Stoplight reporting uses red and amber to highlight trouble areas and green to show the "all clear." While most visualizations of project portfolio data consider each project as an independent entity, dependencies between projects can be highlighted through a dependency matrix or network mapping formats (Killen, 2022). Customizing PPM to best support decision-making in a specific environment usually involves selecting from common methods and then designing the process to include relevant parameters for each method.

Developing an effective dynamic PPM capability takes time; antecedent capabilities must be established before the PPM process can be established (Eisenhardt & Martin, 2000; Cooper et al., 2001). For example, establishing a foundational capability such as a gated project management process is an antecedent to the development of an effective PPM capability, and data gathering capabilities must be developed before the capability to evaluate and adjust the portfolio mix can be established (Martinsuo & Lehtonen, 2007).

As shown in Figure 2, PPM capabilities generally include a gated project management process integrated with a portfolio-level review process at one or more of the gates or decision points. The figure reflects the fact that many organizations develop more than one version of project management process to cater for different project types. The main differences between the versions are in the number of stages and gates and in the types of criteria used to evaluate projects at the gates. Also illustrated are the three main dimensions of a PPM capability: "process" dimensions, "structure" dimensions, and "people and culture" dimensions.

Figure 2 also depicts the post implementation review (PIR) as part of the process. The PIR is an important stage of the process because the "lessons learned" from each project enables the review, evaluation, and improvement of the project management and PPM processes. However, research indicates that this is a weak area in many organizations; it is common for managers to recognize the importance of PIR, but many find it difficult to allocate resources or gain support for such tasks (Killen et al., 2022).

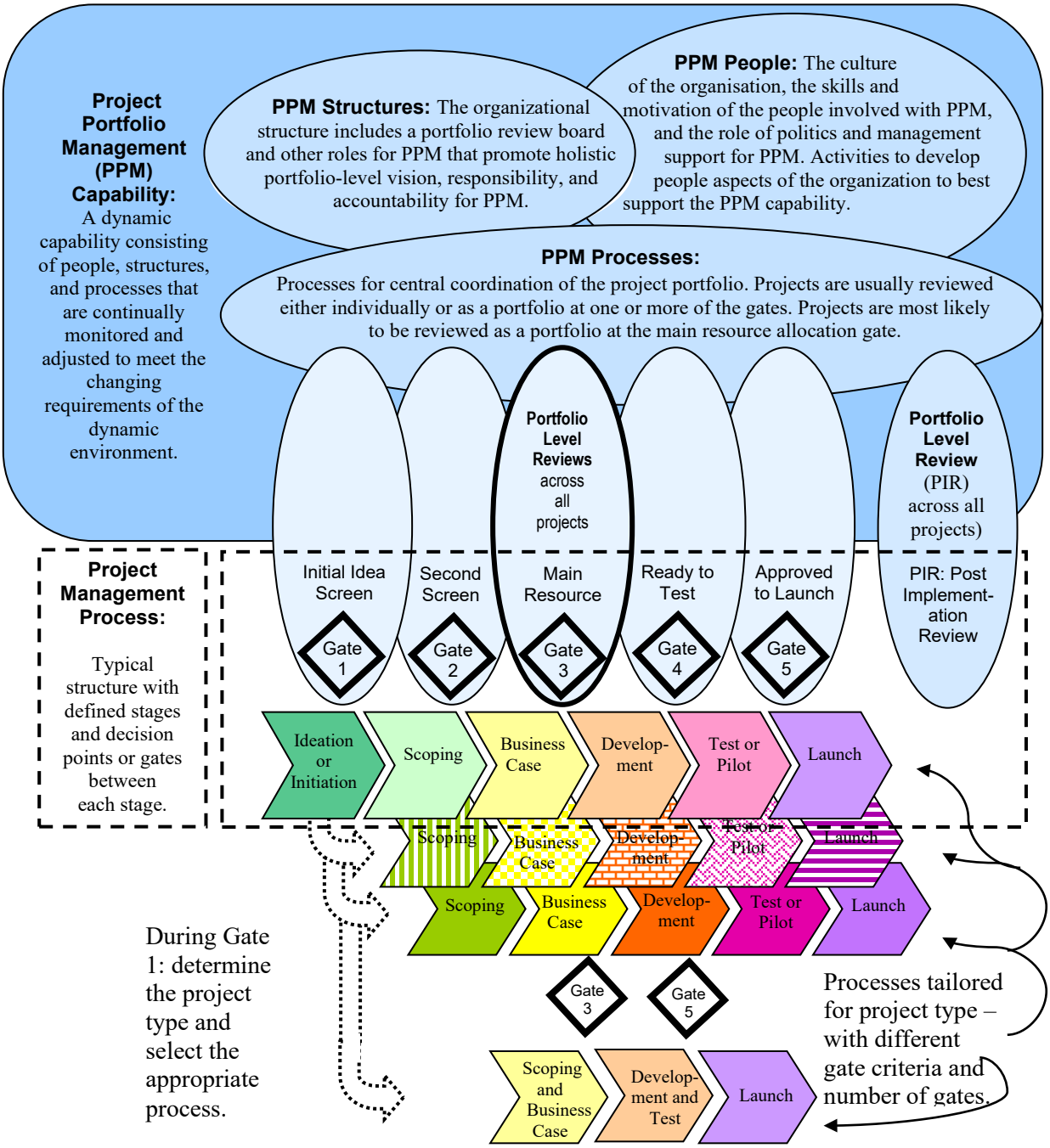

Figure 2: Three Dimensions of PPM Integrated with Tailored Gated Project Management Processes

PPM capabilities can improve organizational flexibility and performance by providing a holistic and responsive decision-making environment in dynamic environments. The role of

the project portfolio manager is becoming formalized as organizations aim to gain the best results from PPM (Jonas, 2010). In addition to the challenge of multi-project management, organizations must address the challenges of an increasingly competitive, globalized, and deregulated environment characterized by shortening life cycles and dynamic markets. An organizational dynamic capability, the ability to adapt and respond to change, is essential in such rapidly changing environments (Killen & Hunt, 2010).

A relatively recent concept of "agile" PPM (Stettina & Hörz, 2015; Hansen & Svejvig, 2018, Kaufmann et al., 2020, Ang et al., 2022), reflects the interest in PPM acting as a dynamic capability; however, the use of the term agile in association with PPM is contentious due to potential confusion with agile project management approaches. Agile project management approaches that offer an incremental and responsive approach to the management of projects are now common in an increasing range of environments; however, such approaches do not operate at the strategic project portfolio level. From the portfolio perspective, PPM can be "agile" and act as a dynamic capability by allowing an organization to identify changes in the environment and to evaluate, analyze, and adjust the portfolio to respond to changes in the environment. To observe changes in the environment, PPM requires a "sensing" capability that involves scanning the environment and regularly re-visiting assumptions (Teece, 2007). The PPM capability is responsible for configuring the organization's efforts by building and allocating resources. A PPM capability acts as a dynamic capability when it provides an organization with competitive advantages by enabling such reconfiguration in a timely fashion.

Dynamic Capabilities and Competitive Advantage through PPM

Dynamic capabilities are a special type of capability that enable an organization to respond to changes in the environment. Frameworks to identify and understand dynamic capabilities have

emerged from research on strategy and competitive advantage. One of the goals of strategy research is to determine why some organizations are more successful than others and to understand the mechanisms that help organizations achieve a competitive advantage. PPM has been identified as one of these mechanisms (Killen et al., 2007; Killen & Hunt, 2010). Competitive advantage is the ability of an organization to create more value than its rivals and, therefore, achieve superior return on investment (Barney & Hesterly, 2012). One of the streams of strategy research is the resource-based view, which proposes that the differences in the levels and types of resources between competing organizations can be used to explain differences in organizational success rates. An extension or offshoot of the resource-based view is the identification of a special class of organizational capabilities that enable organizations to effectively respond to changes in the dynamic environments in which they compete (Teece et al., 1997). "Dynamic capabilities" do this by providing a capacity for "an organization to purposefully create, extend, or modify its resource base" (Helfat et al., 2007 p. 4).

The PPM capability of an organization is one of the internal organizational capabilities or resources that an organization uses to gain competitive advantage. In a dynamic environment, a PPM capability that acts as a dynamic capability can enable an organization to be agile and respond to changes in the environment. Improved innovation capabilities are also associated with dynamic PPM capabilities (Saeed et al., 2021). Although dynamic capabilities are a type of resource-based capability, they do not have the ability to create value independently. Dynamic capacities add value by working with the existing resource base (Eisenhardt & Martin, 2000) and can therefore be considered as "enabling resources" (Smith et al., 1996). It is also important that supporting capabilities are established before a dynamic capability can be effective (Eisenhardt & Martin, 2000). Therefore, a dynamic capability such as PPM must be accompanied by underlying resources and capabilities such as the project management capability to provide long-term competitive advantage in dynamic environments. Dynamic

capabilities play a key role in allocating resources as well as in identifying the desired development and direction of resources and capabilities in line with strategy (Wang & Ahmed, 2007). As a dynamic capability, PPM can improve an organization's ability to "integrate, build, and reconfigure internal and external competencies to address rapidly changing environments" (Teece et al., 1997, p. 516) and through these mechanisms improve the competitive advantage in dynamic environments.

PPM in Dynamic Environments

Learning and change are an important part of the ability of PPM to provide an advantage in dynamic environments (Killen et al., 2008b). Figure 3 illustrates the effect of learning and change on the evolution of the PPM capability to meet the requirements of a dynamic environment. With learning and change, PPM can be a dynamic capability and enhance competitive advantage. Organizational learning is embedded in PPM capabilities through mechanisms for tacit and explicit learning. For example, tacit learning – the type of learning that is difficult to document or codify and is best transferred through experience or observation – is achieved through the interaction of experienced managers in PPM meetings and through the ability of PPM to act as a focal point for decision experiences to be shared and for learning to accumulate. On the other hand, explicit learning – the type of learning that can be codified and documented – is incorporated in PPM through aspects such as standard templates, databases, and defined and documented methods and routines. Both types of learning inform the evolution of the PPM capability and ensure that it remains up to date and relevant in a changing environment. Through this learning, the PPM process is able to deliver competitive advantage in dynamic environments.

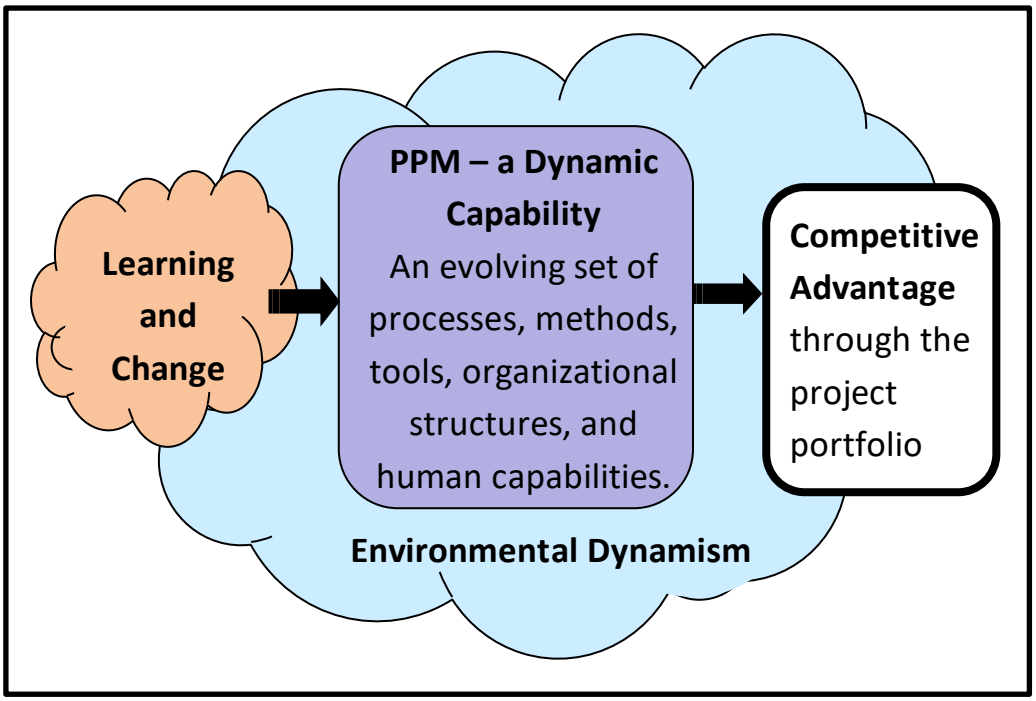

Figure 3: Learning and Change: Competitive Advantage through the Evolution of PPM in Dynamic Environments

Outline of a Dynamic PPM Approach

A typical portfolio-level review process is outlined in Figure 4 and includes four steps: single project data collection, portfolio data development, team decision-making, and implement decisions. In the following discussion, the general aspects of the four steps are detailed first followed by *specific aspects of PPM for dynamic environments in italics.*

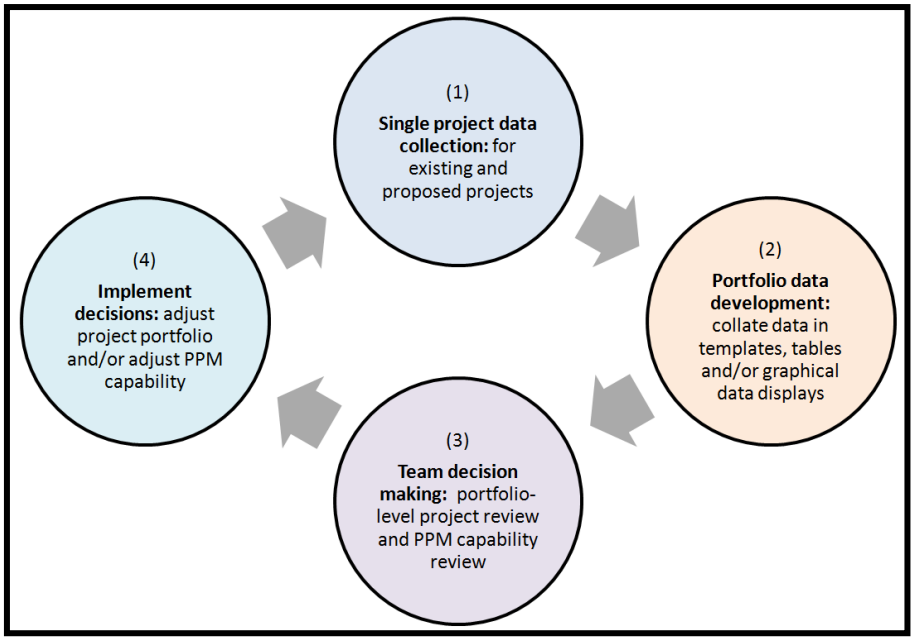

Figure 4: Outline of a Dynamic PPM Approach Including Evolution of Processes through Capability Reviews

Single project data collection

Data is collected for new project proposals and on existing project status to inform decision-making (Kester et al., 2011). The data is generally collected from all relevant projects in a standard form that defines the types of data required to facilitate evaluation. Project data may be obtained from a computer system or through templates or proposal documents. Templates often include a one-page executive summary that highlights the main criteria for the decision-makers to consider; for example, risk, reward, investment, skills and resources required, benefits, and aims.

Dynamic environments may require more frequent refreshing of project data. The relevant types of data must be kept up to date and the templates for data collection may change periodically in response to capability reviews. In addition, beyond simply collecting project

data, a dynamic PPM capability may promote or encourage project ideas that support the organizational strategy. Idea management portals and collaborative tools can be used to assist in the idea and project proposal development process.

Portfolio data development

Drawing on the information for all projects in the portfolio, the data is collated or "rolled up" to provide portfolio-level summaries. The data is then arranged to assist decision-makers with the comparison and evaluation of portfolio data.

Research indicates that "best practice" organizations create graphical and visual information displays such as portfolio maps to facilitate group decision-making (Cooper et al., 2001; Mikkola, 2001; Killen et al., 2008a; de Oliveira Lacerda et al., 2011). Figure 1 illustrates some common portfolio-level data displays, including portfolio maps, which are developed in this stage of the process. Portfolio maps display projects and the strategic options they represent on two axes augmented with additional data to provide a visual representation that incorporates information such as strategic alignment, risk, return, and competitive advantage. Visuals boost the ability of decision makers to understand and retain information by reducing the required cognitive load (Van der Hoorn, 2021). Due to the multiple types of data represented, these types of visual display are often called two-and-a-half dimensional (2½-D) displays (Warglien, 2010).

Such displays and all portfolio-level summaries must be kept up to date in dynamic environments. Some tools and techniques may be better suited to dynamic environments, and new tools and techniques are regularly developed and tested to meet current challenges. For example, network mapping approaches may help identify flow-on effects among interdependent projects arising from changes in the portfolio (Killen and Kjaer, 2012; Killen, 2017).

Team decision-making

In many organizations, a portfolio review board meets periodically to discuss the options available and to make project decisions in the context of the entire portfolio of projects (including ongoing projects as well as new proposals). A portfolio review board generally consists of five to ten experienced executives or managers that represent diverse organizational perspectives and responsibilities. There are many approaches to the timing of portfolio-level reviews; for example, some organizations create an annual portfolio plan, whereas others meet to refine the portfolio every week or so. The timing depends on the organization's environment and is influenced by aspects such as complexity, dynamism in the market, levels of technological change, and project duration. Meetings often employ graphical data representations to inform group discussions and negotiations (Mikkola, 2001; Killen et al., 2008a, Killen et al., 2020). Decisions are made with the entire portfolio in mind and the decision-making will consider resourcing, strategic alignment, balancing risk and other aspects. Typical decisions on new project proposals at a portfolio review meeting range from approval, hold for a later date, and rejection to requests for more information. The decisions relate to new projects as well as existing projects through mid-stream reviews (Rad & Levin, 2008); for example, ongoing projects can be canceled, delayed, accelerated, or left unchanged.

In dynamic environments, enhanced "sensing" capabilities need to be incorporated to detect changes in the environment; the time between decision meetings may need to be shorter; and special mechanisms may be required to enable agile response to unanticipated changes in the environment.

In addition, the regular review of the PPM capability is particularly important. The portfolio review board or other executives who make decisions about the projects in the portfolio must also review the processes used and their outcomes. The reviews track the results of the process

and reflect on how the process worked. If necessary, recommendations for adjustments to the process are made. In a dynamic environment, regular reviews and adjustments will ensure that portfolio processes and outcomes reflect the evolving strategy.

Implement decisions

The outcomes of the portfolio review decision meetings are then implemented. For example, new projects may be initiated; some existing projects may be canceled and resources reallocated; or other existing projects may be accelerated to beat the competition. These changes flow from the decisions made by the portfolio review board and continually adjust the portfolio of projects.

In dynamic environments, the adjustments to the portfolio may be more frequent. When the suggestions arising from the reviews of the PPM capability are implemented, the cycle continues with evaluation and adjustment of the capability as required. In dynamic environments, these reviews are built into the PPM process and drive the continual evolution of the processes for managing the portfolio.

Examples of PPM in Dynamic Environments

What does a dynamic PPM capability look like in practice? The following examples are taken from a study of PPM approaches used by successful innovators. The examples were selected to illustrate practical examples of aspects of PPM capability that can improve organizational agility – an organization's ability to adjust to changes in the environment.

“Sensing” changes in the environment

“Sensing” changes in the environment is necessary for an organization to start the process of evaluating and adapting to those changes (Teece, 2007). A medical devices company recognized the importance of keeping abreast of developments in medical treatments that could potentially influence their product development direction. The medical specialists employed by the organization played a significant role in “sensing” the environment; however, their time was limited and their expertise was focused in specific areas. Recognizing the importance of “sensing” the environment, the organization developed several strategies to keep track of trends and developments in the field. One of these strategies was the development of a medical review board, which consisted of external advisers and specialists from a range of related professions. This initiative greatly extended the available expertise and provided a diversity of perspectives.

Similarly, an approach employed by a telecommunications company was to encourage and facilitate employee involvement in specialist communities through conferences and professional associations. Through these contacts and conference presentations, the employees were better able to contribute to the organization’s ability to “sense” the environment.

Reallocating resources

An important aspect of PPM in any environment, especially dynamic environments, is the ability to stop poor projects and reallocate the resources to other projects. Organizations must be able to ensure that their project portfolio represents the best overall mix at the current time. Often a project that had strong support initially can become less desirable as the environment changes. The emergence of a new technology or competitive product, changes in demographics or foreign exchange rates, or changes in commodity or property prices can radically alter a project’s prospects for success. However, many organizations find it difficult to cancel a poorly performing project and often the people involved resist changes to the project. One

manufacturing organization felt that a culture that supported information and decision transparency and communication was key. They implemented steps to ensure that the criteria, data, and methods for evaluation were openly shared and discussed. In addition, all levels of management visibly supported and participated in the PPM processes. Through these measures, the organization gained strong buy-in and support for the process. With such support, the organization felt that decisions to cancel a project and reallocate resources were understood and supported, which made it easier to cancel projects when necessary.

Ensuring ambidexterity

In many industries, it is important that an organization successfully "exploits" and "explores" at the same time – this is sometimes called "organizational ambidexterity" (Tushman & O'Reilly, 1996; Tushman et al., 2002). Exploitation projects are generally short-term, incremental, or low-risk undertakings that are relied on for day-to-day improvements in existing offerings or operations. In contrast, exploration projects are long-term, high-risk, radical, or breakthrough initiatives that aim to create innovative new capabilities and offerings to bring the organization to the next level. Collating data across the portfolio of projects through PPM can provide an organization with the ability to determine the current balance of project types. This is often done using graphical data displays such as portfolio maps or pie charts.

If an imbalance is found, PPM processes can help redress the balance (Petro, 2017). For example, a digital services organization introduced targeted idea generation activities to increase the number of radical ideas when it realized that its portfolio was skewed toward "exploitation" over "exploration." This type of skewing is common and is known as the "success trap" because accumulated decision-making experiences can reinforce support for short-term "exploitation" projects at the expense of the long-term "exploration" projects that organizations believe are essential for long-term success (March, 1991). As one manager in a

financial services organization commented during an interview: “Short- versus long-term is most difficult to balance, especially with pressure to turn around in a shorter term. Longer term no one gives you any credit for and it is harder to get justification.”

To address this problem an industrial machinery manufacture allocated a set percentage of its budget for each type of project to ensure the appropriate balance. Another approach is to develop a separate tailored process with appropriate evaluation criteria to be used with long-term explorative projects, as illustrated in Figure 2. This approach ensures that innovative ideas and projects are not disadvantaged by having to meet rigid criteria that are not appropriate for “exploration” projects.

Adjusting the portfolio review board

The membership of the portfolio review board is an important part of a PPM capability. In a dynamic environment, the profile of the portfolio review board members may need to be adjusted as the environment changes. For example, one successful manufacturer traditionally had a strong engineering and technical influence on the review board. This served the organization well during its initial stages of developing a best-in-class technology and enabled it to extend its market internationally. However, as the international competitive environment evolved, the portfolio review decisions failed to incorporate marketing and customer-related input, which resulted in several technologically driven projects failing to find a market. On review of the situation, the organization decided to radically change the membership of the portfolio review board to include marketing experience across the main regions. This change allowed the portfolio to better reflect marketing requirements in the regions.

Reviewing and developing PPM methods and tools

Dynamic project environments are often characterized by complexity; interdependency between projects; and constraints in the availability of skills and resources. In such environments, PPM is a complex multi-dimensional challenge and the PPM capability must evolve to stay relevant. The challenge is amplified by the presence of interdependencies as PPM is more than an extension or scaled-up version of project management, which makes the inter-project effects more complex and difficult to predict (Aritua et al., 2009). The management of interdependencies is an area of weakness for PPM (Elonen & Artto, 2003) and is one of many areas where new tools are tested. Practitioners and researchers continually refine existing methods and tools as well as develop and test new ones. For example, network mapping methods to manage project interdependencies have been tested and shown to support decision-making (Killen 2017; Killen & Kjaer, 2012).

Conclusion

In dynamic environments, PPM can act as a dynamic capability that enables organizations to respond to change as it manages and balances the portfolio holistically; aligns projects with strategy; and ensures adequate resourcing for projects to maximize the benefits from project investments.

A PPM capability requires more than tools and methods for evaluating and making decisions on project portfolio data, it also requires appropriate organizational structures, a supportive culture, and top management support. One of the major challenges facing organizations is implementing a PPM capability that is flexible and responsive to changes in the environment. Although there are many common elements identified in PPM processes, there is evidence that

each organization must tailor its PPM process to suit the individual environment and the PPM capability must be able to adapt and adjust to reflect changes in the environment.

A dynamic PPM capability can help project-based organizations develop a competitive advantage by responding to changes in the environment. Learning and change have been shown to be a vital component of a dynamic PPM capability, and several examples of PPM capability aspects that enhance agility were outlined. Practitioners can draw on these examples to stimulate ideas and gain organizational advantages through the development of a dynamic capability using PPM.

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