

# Design Thinking Framework for Project Portfolio Management

Hamed Sarbazhosseini<sup>1</sup>(✉), Sisira Adikari<sup>1</sup>, and Heath Keighran<sup>2</sup>

<sup>1</sup> School of Information Systems & Accounting,  
University of Canberra, Canberra, ACT 2601, Australia

{Hamed.Sarbazhosseini,  
Sisira.Adikardi}@Canberra.edu.au

<sup>2</sup> Business Design, Crooked Fox, Canberra, ACT 2601, Australia  
Heath@crookedfox.com.au

**Abstract.** Project Portfolio Management has been introduced as a strategy to manage multiple projects at the same time. To stay ahead of the competition, organisations require PPM approach to achieve results. PPM is an area of organisational activity that helps organisations to govern the selection of projects and/or programs and management of organisations. The PPM discussed as an area that requires conceptualisation to give meaning to it and make it usable for organisations. This paper applies design thinking framework to conceptualise PPM and to investigate what Australian Government Organisations wish to achieve through the PPM. Findings of the study are important in better understanding the complexities of PPM.

**Keywords:** Project Portfolio Management · Design thinking framework

## 1 Introduction

Project Portfolio Management has been recognised as one of the information systems areas that require further research and frameworks to better understand its effectiveness for academics and practitioners. The research study presented in this paper was motivated by the need to develop a design-oriented conceptual framework to conduct research in a domain that has a little academic foundation.

A design thinking framework has been applied to PPM theory to conceptualise its meaning and to better understand what Australian Government Organisations (AGOs) wishing to achieve.

A summary of PPM's literature has been discussed in this paper in terms of three main sources; academic, industry and software. The design thinking framework of PPM has been introduced to comprehend how the data can be collected and analysed. The finding of this paper has a significant contribution to PPM and design thinking framework of PPM.

## 2 The Project Portfolio Management

For organisations to deliver better outcomes, managing multiple concurrent projects “an endeavour (temporary [1]) in which human, (or machine) material and financial resources are organised in a novel way to undertake a unique scope of work, of given specification, within the constraints of cost, quality and time, so as to deliver beneficial change defined by quantitative or qualitative objectives [2] ” and programs “a group of projects that are managed in a coordinated way to gain benefits that would not be possible were the projects to be managed independently [3] ” is essential.

PPM is a dynamic decision-making process in which new projects and/or programs are evaluated, selected and prioritised and balanced in the context of the existing projects and programs within the portfolio [4].

Organisations are attracted to PPM because of the claims made for it. Kersten and Verhoef [5] and Verhoef [6] argue that firms reduce IT (Information Technology) spending by 10 to 40 percent using PPM. Laslo [7] claims that PPM allows an organisation to maintain agility while avoiding wasteful investments and Thorp [8] argues PPM techniques are fundamental to getting value from IT projects. According to Rongzeng et al. [9], banks look for ways to cut costs and eliminate waste in IT expenditure and such approaches are advised to taking a portfolio management approach.

### 2.1 Academic Literature

Portfolio management has been introduced as a theory in 1952 from financial investments [10]. The purpose of the initial theory of portfolio was aimed at determining the particular combination of investments to maximise returns for the owners at a given level of risk [11]. The theory was used as a mathematical solution for the selection of research and development projects [12].

Portfolio management has been adopted in the ICT (Information and Communication Technologies) management domain from the finance sector in 1981 [13]. On 1988, the theory was applied as a mathematical solution to the selection of research and development projects [12].

Based on Michael [14] most of the portfolio management articles were published from the mid-1990 s onwards. Numbers of published journals articles increased “from two in 2000 to 35 in 2004” [15]. As such, the study suggested that there was a significant development of standards in the domain of portfolio management. PPM has been investigated from different aspects such as potential resource shortages [16]; Management of interdependencies [17]; right number of projects [18, 19]; PPM and program Management [20, 21] and strategic alignment [22].

### 2.2 Industry Standards

Industry standards seem to offer reliable information to the field. Currently, there are two main standards identified in PPM published by the Project Management Institute [23],

and the UK's Office of Government Commerce [24]. While there are two standards available, the correct implementation of PPM and its attributes are not defined clearly.

### 2.3 PPM Software

In a comparative study of PPM software and PPM theory, Sarbazhosseini and Young [25] found that PPM vendors aim to achieve strategic alignment, balanced portfolios, maximised value of portfolios and a centralised source of information. However, the software did not seem to address issues such as selecting the right number of projects, or ensuring portfolio sufficiency versus overall product innovation goals. The software did; however, seem to have attributes that were not considered in the research literature.

## 3 Design Thinking Framework for PPM

There are number of definitions for information system design which considers the use of computer systems, human activity system, the people and technological system, the environment and context, and organisational context [26].

In the perspective of information systems, this study considered levels of environment namely, real-world, organisational context, and the context of use to present a global view of information system and the user interaction. The Design thinking is the way designers think and apply their mental processes to design objects, services or systems, as distinct from the result of elegant and useful products [27].

The Design Thinking is "a methodology used by designers to solve complex problems and find desirable solutions for clients" [28]. It is also mentioned that "design is the action of bringing something new and desired into existence- a proactive stance that resolves or dissolves problematic situations by design. It is a compound of routine, adaptive and design expertise brought to bear on complex by dynamic situations [29]."

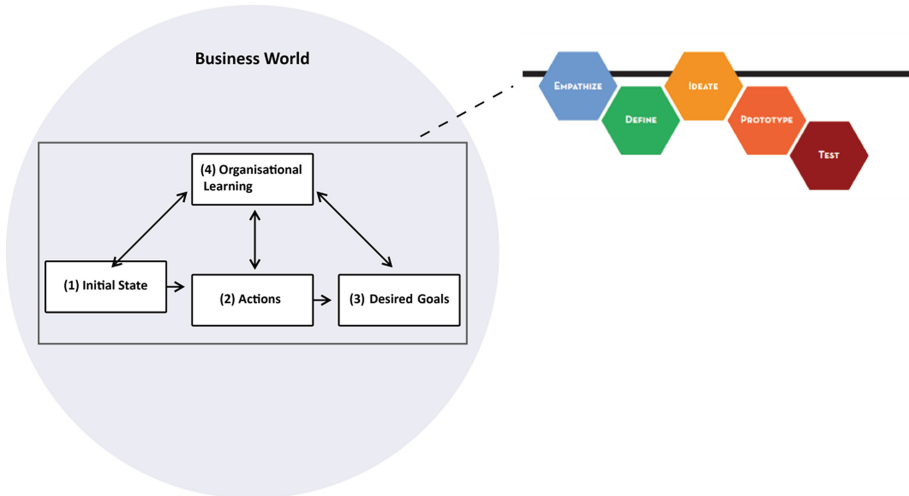
The Design Thinking process "defines the problem first and then implements the solution, always with the needs of the user demographic at the core of concept development [28]." These processes consist of five steps; Empathize, Define, Ideate, Prototype, and Test [28]. Within these steps, problems can be framed, the right questions can be asked, more ideas can be created, and the best answers can be chosen [30].

PPM in this research has been conceptualised based on design thinking method, and State-Transition Model (STM) has been offered as a conceptualisation approach to PPM.

The STM is being used in Clinical [31] and Ecological [32] applications in order to evaluate the state of the ecosystem and evaluate patient's status in different medical time frames. It also has applications in software engineering, being used in UML (Unified Modelling Language) and state-charts [33].

It is the on-going, continuous nature of PPM that makes the STM useful in looking at organisational state, change and responsiveness as by its definition that PPM is the dynamic and on-going environment and context. The developed framework has been updated from a previous approach discussed [34]. The design thinking framework for PPM based on organisational approach in Business World consists of four elements of

(1) initiation of projects and/or programs; (2) identification of actions, tools and techniques; (3) clarification of desired goals for organisations; and (4) learning from organisational changes and overall system, to improve its performance (See Fig. 1).



**Fig. 1.** Design Thinking PPM Framework

This framework works circular meaning that in each state of Business World, the organisation would learn from its performance, and that can enhance the same state as well as updates the other states to improve the overall performance of the organisation.

While there is a little clarification in the PPM literature about each state, it is assumed that this framework would assist to better investigate and better understand the PPM in government organisations as well as theory.

Recently, Sarbazhosseini et al. [35] discussed the organisational issues involved in project portfolio management. In addition, an evaluation of Business World of the STM has been discussed in [36] to better understand similarities and differences in each state. This paper aims to investigate desired goals and outcomes from the framework in AGOs.

## 4 Data Collection Methods and Analyses

To investigate the developed framework in the PPM field, we conducted a set of interviews with directors of portfolio management offices in AGOs. Data was also gathered from documents provided such as P3M3 reports, roadmaps, strategic plans, capability improvement plans, annual reports, and portfolio statements.

The interview protocol followed a set of procedures and instruments used to specify interactions between researchers and study participants including designs for participant contact, the interview data collection instrument, the interview script and analysis techniques as suggested in [36]. The interview notes included items from the proposed framework.

Interview questions were developed based on four states of the developed framework. The data collection was conducted using interviews and document reviews. Then data were analysed based on structural coding and thematic analysis.

Structural coding applies a content-based or conceptual phrase representing a topic of inquiry to a segment of data that relates to a specific research question used to frame an interview [37]. It is also explained that structural coding is a question-based code. During the structural coding of data, it was discovered that there were possible new categories other than the categories developed in the framework.

Based on Saldana [38, p. 139], a theme is an outcome of coding, categorisation, and analytic reflection, not something that is, in itself, coded. Boyatzis [39] explains that a theme “at a minimum describes and organises possible observations or at the maximum interprets an aspect of the phenomenon.” Thematic analysis and the search for themes in the data are a strategic choice and part of the research design that includes the primary objectives, goals, conceptual framework and literature review [38, p. 139].

In this paper, the data analysis includes findings of desired goals for AGOs. The summary of findings would be represented based on themes which were discovered for each state of the framework. In the next section, the discovered themes would be discussed.

## 5 Findings and Discussion

The analysis of data represented some themes which were identified for the desired goal of organisations. As it is represented in Table 1, seven themes were discovered for PPM’s desired goals. The description of each desired goals represents that what state organisations wished to be in each of the themes.

**Table 1.** Themes in Desired Goals

Themes in Desired Goals	Description
1. Visibility	To improve the state to Higher; e.g. higher visibility.
2. Transparency	
3. Accountability	
4. Consistency	
5. Strategic goals	To deliver government initiatives
6. Doing the Right Projects	To make right decisions and deliver goals
7. P3M3	Case 1: Maintain level 2, focus on Benefit Management
	Case 2: Target level 4, focus on Stakeholder Management and Risk Management
	Case 3: Target Level 3, focus on Risk Management
	Case 4: Target Level 3, Focus on Improving Consistency and developing standard portfolio processes
	Case 5: Target level 3, focus on Benefit Management
	Case 6: Target level 3, Focus on Benefit and Stakeholder Management
	Case 7: Target Maintain level 3, Focus on Resource and Benefit Management

According to Table 1, organisations wish to achieve higher visibility, transparency, accountability and consistency. The organisations believed that with the use of PPM, they will have consistent decision-making processes because PPM frames their actions and processes. For the same reason, PPM helps them to increase the level of visibility, transparency, accountability and consistency in organisations.

Also, it shows that organisations desired to achieve strategic goals in order to deliver what they have been asked. The P3M3 reports indicated that organisations, in order to target a new level, need bigger budgets, however, they wish to improve their levels by considering different issues.

This research from a desired state perspective showed agencies are striving to achieve organisational goals and government initiatives which also called as strategic goals. To achieve this they recognise that improving the portfolio level of Benefit Management and Risk Management in P3M3 assessment is essential. This concept links the desired state mentioned in the literature [36]. Literature demonstrated organisations are wishing to achieve “linking portfolio to the strategy and maximising the value of portfolios.” This could be seen to have links to Benefit Management. In addition, “achieving the balanced portfolio” can be seen as Risk Management.

## 6 Conclusion

In this paper, we developed a design thinking framework for PPM, to investigate what organisations desire to achieve. The designed framework was helpful in developing the interview questions and data collection instruments. The set of interviews were conducted with seven organisations to collect the required data. Data was analysed based on structural coding and thematic analysis which considered four main states of the framework. Themes from the analysis were identified and discussed in this paper. The findings of the paper represented that organisations wished to achieve higher Visibility, Transparency, Accountability and Consistency in their organisations.

Organisations also apply PPM to have a better framework for the entire organisation to communicate better and better control management of the resources and projects/programs. Organisations wish to achieve strategic goals by prioritisations and balancing their portfolios to do the right projects. The analysis of P3M3 reports indicated that organisations are mainly focusing on improving their benefit and resource management to have a better performance in their organisations and achieve their organisational goals.

The proposed designed-oriented framework assisted to better capture PPM theory in organisations and to better understand the goals they are aiming to achieve. The framework clarifies the current use of PPM in AGOs. It is suggested that organisations and researchers investigate this framework in a different places and evaluate other states to identify if their initial state and actions lead to desired goals. It also can be suggested to compare this framework with other designed thinking frameworks.

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