



7th International Conference on Engineering, Project, and Production Management

Investigating Association of Benefits and Barriers in Project Portfolio Management to Project Success

Nick Hadjinicolaou*, Jantanee Dumrak

Global Project Management, Torrens University Australia, Wakefield Street, Adelaide, South Australia 5000, Australia

Abstract

Projects are increasingly initiated by organisations across Australia in alignment with the corporate strategies. This paper investigates and analyses the application of PPM in Australia by conducting a questionnaire survey with senior project, program and portfolio managers across Australia. The results suggested improvement in decision making, maximizing resource usage, alignment with business strategy and organisational risk reduction are the most common benefits found when implementing PPM. On the other hand, internal politics and culture, lacking organisational management support, and disagreement on a common project prioritization approach are the main barriers impeding the application of PPM.

© 2016 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Peer-review under responsibility of the organizing committee of EPPM2016

Keywords: project management; project portfolio management; project success; portfolio management practices

1. Introduction

According to the Chaos Report 2015 [1] which measures project success for information technology projects, success rates for projects continue to be a problem and well below 50%.

The group's definition of a successful project was redefined in 2015 to include a measure of perceived value by the customer in addition to the triple constraint of delivering on time, within budget and to the required scope. As a result of adding perceived value project success rates further dropped by 7% [1]. It has been estimated that one third of the world's economy is generated through projects [2]. The tangible benefits of projects may include increasing sales, improved efficiencies, improved profit margins and cash flows through increased revenue or reduced costs are amongst these. Intangible benefits might include areas of safety, improving customer service, relationships with stakeholders, and organizational capability [3].

* Corresponding author. Tel.: +6-188-113-7811.

E-mail address: nhadjinicolaou@laureate.net.au

Organizations are increasingly realizing that corporate strategy is delivered through projects, and selecting the right projects is key to their ability to deliver their strategic intent is required for strategic alignment [4]. Managers must decide how best to use available resources, manage the level of project and portfolio risk and other considerations such as strategic alignment in the selection and governance of projects. The decision making processes for project portfolio selection, tools and capability to select the chosen projects carefully to achieve the desired benefits will impact on project success [5]. In 2013, the Project Management Institute (PMI), a leading global project management association, reported that project failure rates remain high [6] and continue to be a global problem. Projects and programs are increasingly used by organizations across Australia to achieve corporate strategy with the scarcity of resources and the management of uncertainty being common problems shared by organizations. Portfolio management practices support organizations in prioritizing and selecting the right projects to meet strategic objectives and improve project success rates. A seminal paper written in 1952 by Harry Markowitz on Modern Portfolio Theory (MPT) addresses that the goal of MPT is to optimize a portfolio to generate the highest level of return for given levels of risk. It distinguishes between efficient and inefficient portfolios calculating the risk return as a whole [7].

2. Research Methodology

The research data was collected from 35 executives who have experienced project portfolio management practices across different sectors in Australia. The data were gathered using online questionnaire survey which was designed to be a structured questionnaire with closed and open questions. The closed questions were to obtain definite and concrete answers, while the open questions were limited to the form of 'Other (please specify)' to invite the respondent's opinion other than the provided options. The analysis of the collected data was conducted using three means: descriptive analysis, Kruskal-Wallis Test and Spearman Rank Order Correlation (ρ).

The descriptive analysis was employed to generate overview results of the respondents and project portfolio management (PPM) in Australia. Kruskal-Wallis Test, a test for non-parametric statistics, was utilized to conduct between-groups analysis when the studied variables are in three or more groups [8]. The study questioned if benefits and barriers of PPM were the same in all studied sectors and if benefits and barriers of PPM were associated to project success. The statistical analysis using Spearman ρ was conducted to indicate the relationships between benefits and barriers of PPM practices and project success. The process of data analysis followed the four steps modified from Creswell and Plano [9] including 1) Preparing the data for analysis, 2) Exploring the data, 3) Analyzing the collected data, and 4) Representing the data analysis. The analysis was performed using Statistical Package for the Social Sciences or Statistical Product and Service Solutions (SPSS). It is to be mentioned that the analysis of this research employed non-parametric test which is commonly used when the small sample size and categorical data are obtained [8]. In this research the nominal data and ordinal scale (or ranking scale) were used to form categories of the studied objects or individuals. Although the nominal and ordinal data can provide magnitude within choice selection and rankings, for example, lowest to highest or most to least, the data contains unequal unit size and an absolute zero [10].

3. Respondent Information

The results of the questionnaire survey obtained from 35 research participants consisted of 26% telecommunications, 14% information and technology, 12% transport and logistics, 11% government, 11% banking, finance and insurance and 11% education, 9% energy and 6% construction sectors. The respondents in this research were mainly program managers (31%) and senior project managers (17%). Amongst the research participants, the positions were 31% program managers, 23% project managers, 11% other managers, 9% PMO managers, 3% chief information officers, 3% general managers and 3% portfolio managers. Forty per cent of the respondents reported their experience in the addressed positions from 2 to 5 years whereas the same 17% was found in the groups of experience less than 1 year, from 1 to 2 years and from 5 to 10 years. Nine percent of the respondents reported their experience of greater than 10 years.

4. Organizational Portfolios in Australia

This section focuses on the overview of PPM from the studied Australian sectors including size for organizational portfolio, duration of portfolio manager utilization and common PPM practices used in Australian organizations.

It was found in this research that the most common size for the studied organizational portfolios in Australia was up to AUD 50 million (29.7%) whereas the sizes up to AUD 10 million and 100 million were found at the same percentage of 16.2. On the other hand, the research found that the portfolio sizes up to AUD 500,000 reported to be the smallest group (2.7%) while 5.4% of the respondents reported the size over AUD 1 billion. It was also found that 16.2% of the respondents remained unwilling to disclose their portfolio sizes.

5. PPM practices in Australian organizations

To understand the nature of PPM in Australia, the research included a question on PPM practices executed in the studied Australian sectors. It was found that all research respondents addressed six different PPM combined practices. Sixty-three percent of the respondents indicated that their organizations group projects together as a portfolio to facilitate the effective management of the work in order to meet strategic annual business objectives. Fifty-seven percent of the respondents mentioned that the organizations they work for has a project management office (PMO) to combine support for project and portfolio management practices as well as group related project together to manage them in a coordinated way in order to obtain benefits and control. Fifty-four percent mentioned that their organizations group related project to manage them in a coordinated way in order to obtain benefits and control. Whereas 46% of the respondents reported that their organizations have a PPM manager assigned. On the other hand, the research found that having a separate portfolio management office (PmMO) dedicated to support project PPM practices as well as creating and maintaining portfolio roadmaps, portfolio performance management plans, portfolio communications management plans and portfolio risk management plans were minimal (20% and 29% of the responses respectively) compared to other practices.

6. Experiences of PPM benefits and barriers in Australian sectors

To study PPM experienced by the Australian industry, the research included the analysis of Kruskal Wallis Test to explore differences between sectors on benefits each sector perceives from applying PPM. According to the results presented in Table 1, the statistical significance (Asymp. Sig.) for all categorical data is greater than 0.05 which indicates that all respondents agreed to the same studied objects and degrees of benefits in applying PPM. Nevertheless, the variable "Project redundancies have been eliminated" which shows the Asymp. Sig. of 0.041. This can be interpreted that levels of agreement on the benefit of PPM application in relation to the variable are diverse.

Table 1. Kruskal Wallis Test for Benefits of PPM in Australian Sectors.

Benefits of PPM Practices	χ^2	Asymp. Sig
We work on right projects	3.024	.933
We are spending in the right areas	4.063	.851
Decision making has improved	7.497	.484
Project redundancies have been eliminated	16.079	.041
Poor projects are killed	5.829	.666
Our resources are allocated optimally	12.020	.150
PPM has led to increased cost savings	6.850	.445
Our projects better align to business strategies	7.556	.478
PPM has led to increase in profits	9.355	.228
PPM has reduced organisational risk	10.783	.214

Benefits of PPM Practices	χ^2	Asymp. Sig.
PPM has maximised resource usage	9.532	.299
Demonstrated value to key stakeholders	9.280	.319
Gaps in the portfolio have identified and been managed	7.224	.513
PPM has led to improved time to market	10.643	.155
PPM have facilitated for repeatable success	10.172	.253

More additional opinions from the respondents on the benefits to the application of PPM include:

- As Portfolio management is relatively new, actual benefits are not yet seen. The potential is huge, but changes are not being seen
- Project portfolio project program management in our organization has provided some strategic objectives, shared resources in the group, help select new opportunities and provided new opportunities in venture capital
- Organizational process improvement within the PPM practices.

As a result of the mean ranks obtained from Kruskal Wallis Test, this study found that most of the perceived PPM benefits showed higher scores in the construction sector compared to other sectors (as in Table 2) except ‘Decision making has improved’ and ‘PPM has reduced organizational risk’. On the other hand, the government and transport and logistic sectors reported the highest number of the lowest scores for PPM benefits with one common agreement on ‘PPM has led to increase in profits’.

Table 2. Mean Ranks of PPM Benefits in Australian Sectors.

	Banking, finance and insurance	Construction and engineering	Education	Energy (Production and/or Distribution)	Government	Information technology	Telecommunications	Transport and logistics
We work on right projects	10.7	15.5 *	11.8	15.5*	11.8	10.0#	14.7	15.5*
We are spending in the right areas	12.3	18.0*	14.0	10.0#	14.0	12.0	10.8	18.0*
Decision making has improved	10.7	13.5	10.7	19.8	10.2#	13.4	11.4	23.0*
Project redundancies have been eliminated	5.7#	20.0*	20.0*	12.0	16.0	11.0	8.0	20.0*
Poor projects are killed	11.0	19.0*	15.0	15.0	13.0	13.0	9.4	7.0#
Our resources are allocated optimally	8.0#	23.5*	18.0	9.17	13.0	13.9	10.5	8.0#
PPM has led to increased cost savings	10.6	20.3*	12.7	16.5	10.8	10.8	11.9	5.0#
Our projects better align to business strategies	12.6	20.0*	11.7	15.5	9.6	9.6	4.0#	15.5
PPM has led to increase in profits	12.5	21.0*	14.3	7.0#	9.5	9.6	15.8	7.0#
PPM has reduced organizational risk	11.5	15.0	15.0	18.2	9.5	9.5	4.0#	24.5*
PPM has maximised resource usage	10.3#	20.8*	19.5	13.3	11.5	8.6	12.6	17.0
Demonstrated value to key stakeholders	14.0	21.0*	9.0	17.0	11.0	8.0#	12.2	17.0
Gaps in the portfolio have identified and been managed	9.5	20.0*	12.3	16.2	8.5#	11.4	14.1	20.0*
PPM has led to improved time to market	11.8	23.5*	15.2	8.5	5.0#	13.5	12.5	8.5
PPM have facilitated for repeatable success	10.1	24.5*	9.5	16.5	9.0#	11.3	12.3	16.5

The research results revealed that the benefits of PPM application were not seen outstandingly, the research further examined the barriers to implementing an effective project portfolio management process in Australian organizations (as in Table 3). Using the Kruskal Wallis Test, Asymp. Sig. of all tested variables was greater than 0.05. Therefore, it can be interpreted that all respondents in this research agreed on the same types and at the same agreement levels to the barriers of the PPM implementation.

Additional comments on the barriers to PPM implementation were:

- As portfolio management is relatively new, it is up against resistance from groups that would be required to change to suit
- Playing lip-service rather than actual change is more important
- Disagreement on pace of adoption.

Table 3. Barriers to PPM application in Australian organizations.

Barriers to PPM Practices	χ^2	Asymp. Sig
Lack of broad organizational support	6.959	.433
Lack of organizational unit responsible for managing the process	7.008	.428
Difficulty to agree on a common approach to prioritize projects	7.134	.415
Unavailability of systems that provide timely data to measure success	4.367	.737
Lack of business case to show value of portfolio management	7.250	.403
Lack of information on resources	9.353	.228
IT Infrastructure not in place to support portfolio management	8.910	.259
Organization's business strategy not well developed or communicated	2.837	.900
Immaturity of project management processes	11.065	.136
Internal politics and culture of resistance to change	10.160	.180
Lack of executive sponsorship	4.799	.684
Shifting in business priorities	6.011	.538
Impact on existing organizational processes and systems	5.690	.576
Higher priority organizational and change management issues to address	5.265	.628
Inadequacy of projects to justify PPM	8.943	.257

From the Kruskal Wallis' mean rank in Table 4, the research discovered that the transport and logistics sector reported experiencing PPM barriers more than other sectors included in this study. While the mean rank scores of 'Immaturity of project management processes', 'Lack of broad organizational support', 'Difficulty to agree on a common approach to prioritize projects' and 'Lack of executive sponsorship' were the highest mean rank scores listed this sector, they showed the lowest scores in the construction sector.

Table 4. Mean Ranks of PPM Barriers in Australian Sectors.

	Banking, finance and insurance	Construction and engineering	Education	Energy (Production and/or Distribution)	Government	Information technology	Telecommunications	Transport and logistics
	Mean rank/*Highest mean rank score/#Lowest mean rank score							
Lack of broad organizational support	12.3	3.5#	12.0	12.2	12.0	16.5	12.1	21.0*
Lack of organizational unit responsible for managing the process	16.3	7.8	7.8	6.3#	11.8	13.4	11.3	19.0*
Difficulty to agree on a common approach to prioritize projects	16.1	6.0#	8.3	11.8	11.0	11.0	12.9	20.5*
Unavailability of systems that provide timely data to measure success	16.3*	9.5	11.0	14.0	9.5	8.0#	11.8	14.0
Lack of business case to show value of portfolio management	18.7*	6.5#	13.2	11.5	11.5	9.0	11.5	6.5#
Lack of information on resources	9.8	7.8	9.7	9.6	9.6	6.9#	16.1	20.0*
IT Infrastructure not in place to support portfolio management	18.5*	5.0#	13.6	8.0	8.0	9.9	14.9	15.5
Organization's business strategy not well developed or communicated	14.2	8.3#	12.0	14.2	10.5	10.5	9.4	15.0*
Immaturity of project management processes	17.2	3.5#	6.0	14.2	10.5	12.8	12.7	21.5*
Internal politics and culture of resistance to change	14.0	4.5#	8.0	12.0	20.0*	14.0	12.8	20.0*
Lack of executive sponsorship	12.5	6.5#	12.3	8.3	16.3	14.4	12.2	20.5*
Shifting in business priorities	13.3	6.0#	7.5	10.5	10.5	13.3	12.8	19.5*
Impact on existing organizational processes and systems	12.3	6.8	9.5	12.5	15.3*	12.5	12.4	3.5#
Higher priority organizational and change management issues to address	15.4*	7.0#	13.0	13.0	13.0	8.3	14.9	13.0
Inadequacy of projects to justify PPM	8.3	8.3	14.5	8.3	4.0#	10.4	11.9	20.0*

7. Association of benefits and barrier in PPM to project success

According to Constantino et al. [11], the critical success factors (CSFs) refer to the factors that help organizations to increase their ability in delivering full project implementation. The project success criteria considered in this study were on time, under or on budget, delivered to specification, delivered to quality required, team effectiveness, stakeholder satisfaction, business success and future readiness. To relate how benefits and barriers of PPM impact on project success, this study includes an analysis on Spearman's Rho Correlation as a non-parametric statistical method to measure the strength of association between the studied variables i.e. between benefits and barriers of PPM, and project success criteria. The correlation coefficient represents the statistical association. The closer the correlation is to 1 the stronger the positive association between variables (if x value increases, y value also increases). On the other hand, the closer the correlation is to -1 the more opposite is the association (if x increases, y value decreases). The results of Spearman's Rho Correlation were visualized using a graphical presentation as shown in Figure 1. Any variables reported with no statistical significance (where p -value > 0.05) were excluded from the presentation.

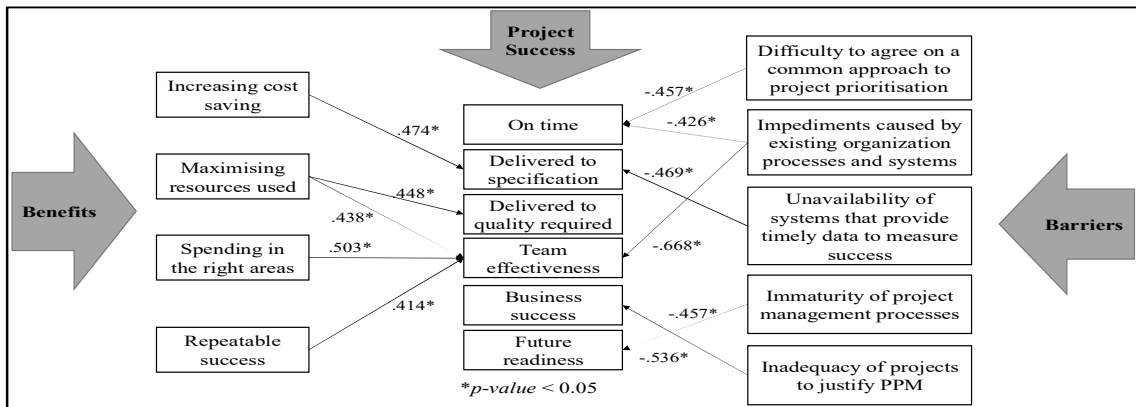


Fig. 1. Relating benefits and barriers to project success.

The analysis discovered four main benefits that supported project success including increasing cost saving, maximizing resource used, spending in the right areas and repeatable success. The degree of correlation coefficient was between 414 and 503 which indicated a moderate level of relationship. On the other hand, the degree of correlation coefficient between the barriers to PPM and project success was from 426 to 668 which also indicated a moderate level of opposite relationship. These barriers include difficulty to agree on a common approach to project prioritization, impediments caused by existing organization processes and systems, unavailability of system that provide timely data to measure success, immaturity of project management processes and inadequacy of projects to justify PPM.

8. Conclusions

The investigation into the project portfolio management (PPM) practices in the key Australian sectors conducted in this study revealed different portfolio sizes from eight key sectors in Australia. However, this study included only subjective perceptions of PPM benefits and barriers in association with the context of success factors. The study did not intend to provide an in-depth analysis into how PPM practices have been implemented in the studied sectors. This study showed that some sectors such as banking, finance and insurance, information technology and telecommunications, the sizes of portfolio can be diverse. In others e.g. construction an engineering, energy production and distribution, and transport and logistics, the sizes of portfolio remained specific. Regardless the sizes of the organizational portfolio, common PPM practices were urged for exploration. One of the common PPM practices was to have PPM managers assigned to group projects and facilitate effective management to meet strategic business objectives. This study found a connect between PPM and having project management offices (PMO) to support both project and portfolio implementation. Further examination was conducted further to identify benefits of PPM and barriers that impeded the PPM practices. It was discovered that the key benefits of PPM practices were related to alignment to business strategies, improvement in decision making, maximizing resource usage and organizational risk management while the key barriers to the PPM practices were found to be internal politics and change resistance culture, disagreement on a common project prioritization method as well as lacking organizational management support. The study demonstrated the relationships between benefits and barriers of PPM and found moderate linkages between the key project success criteria and PPM's benefits and barriers. Future research and industry professional can benefit from this research by developing PPM benefits management so that the required benefits can be maintained or enhanced. On the other hand, it is important that barriers of PPM especially the barriers preventing projects from success must be minimized or mitigated.

Acknowledgements



Ministry of Science
and Higher Education
Republic of Poland

7th International Conference on Engineering, Project, and Production Management (EPPM2016) was financed in the framework of the contract no. 712/P-DUN/2016 by the Ministry of Science and Higher Education from the funds earmarked for the public understanding of science initiatives.

7th International Conference on Engineering, Project, and Production Management (EPPM2016) finansowana w ramach umowy 712/P-DUN/2016 ze środków Ministra Nauki i Szkolnictwa Wyższego przeznaczonych na działalność upowszechniającą naukę.



7th International Conference on Engineering, Project, and Production Management (EPPM2016) was co-organised by the Agency for Restructuring and Modernisation of Agriculture (Poland).

References

- [1] *CHAOS Report 2015*. The Standish Group International.
- [2] Turner JR. *The handbook of project-based management*. 3rd ed. New York: McGraw-Hill; 2009.
- [3] Archibald RD, Prado D. The importance of knowing your project, program and portfolio management maturity. *PM World Journal* 2014;3:1–8.
- [4] Meskendahl S. The influence of business strategy on project portfolio management and its success: a conceptual framework. *International Journal of Project management* 2010;28:807–817.
- [5] Crawford L, Hobbs JB, Turner JR. Aligning capability with strategy: categorizing projects to do the right projects and to do them right. *Project Management Journal* 2006;37:38–50.
- [6] PMI. *PMI's pulse of the profession in-depth report: the impact of PMOs on strategy implementation*. Newtown Square, Pennsylvania: Project Management Institute; 2013.
- [7] Markowitz H. Portfolio section. *The Journal of Finance* 1952;7:77–91.
- [8] Pallant J. *SPSS survival manual*. 5th ed. Crows Nest. New South Wales: Allen & Unwin; 2013.
- [9] Creswell JW, Plano VL. *Designing and conducting mixed methods research*, 2nd ed. Thousand Oaks. California: Sage; 2011.
- [10] Jackson SL. *Research methods and statistics: a critical thinking approach*. 3rd ed. Belmont. California: Wadsworth; 2009.
- [11] Constantino F, Gravio FD, Nonino F. Project selectin in project portfolio management: an artificial neural network model based on critical success factors. *International Project management Journal* 2015;33:1744–1754.