Relationship Investigation of Organizational Agility Characteristics and Portfolio Management Maturity

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Abstract. Today's organizations operate within rapid changes in economy and market conditions. Organizational agility (OA) provides organizations with the ability to adapt rapidly to internal and external changes productively and cost-effectively. Furthermore, the adaptive ability and real-time responsiveness of organizations are generally necessitated for projects and portfolios to reach maturity. While the characteristics of OA and portfolio management maturity (PfMM) have been studied in the existing literature, the relationships between these two variables have not been fully explored. This study employs canonical correlation analysis (CCA) not only to investigate relationships among the characteristics of OA and PfMM but also to present the status quo of the studied variables from Australian perspectives. The results of the analysis are graphically presented to identify the formation of each OA characteristics at different levels of PfMM. The research data was collected from 36 respondents in public and private Australian sectors. The research findings show diverse combinations of the OA characteristics constructed at different levels of PfMM. The results also identify specific OA characteristics that highly contribute to the highest level of PfMM. This allows organizations with limited resources to precisely concentrate on the characteristics that will improve performance and achieve PfMM.

Keywords: canonical correlation analysis, maturity, organizational agility, project management, project portfolio management

1 Introduction

The concepts of Organisational Agility (OA) and Portfolio Management Maturity (PfMM) have evolved around an organisations desire to improve performance and competitiveness. This has occurred as a result of pressures from digital disruption, merging of technology, greater customer needs and levels of customer satisfaction demanded. Market competition,

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legislative, political and economic pressures [1] have also played a role in the need for increased organizational agility. According to PMI [2] (p. 2), organizational agility is "the capability to quickly sense and adapt to external and internal changes to deliver relevant results in a productive and cost-effective manner". Agility accelerates organizational learning to meet the pace of rapid environmental change through flexibility in assembling resources, knowledge, processes and capabilities [3, 4]. It is believed that agility helps organisations to sustain their competitive advantage by increasing responsiveness in managing and making business decisions. However, the application and improvement in Portfolio Management Maturity (PfMM) demands more than commitments of new policies and procedures but rethinking in organisational structures, systems and management practices [5, 6]. In this research, characteristics of organisational agility are examined and the results of the analysis are graphically presented to identify the formation of each OA characteristics at different levels of PfMM. The research data was collected from 36 respondents in public and private Australian sectors. The research findings show diverse combinations of the OA characteristics constructed at different levels of PfMM. The results also identify specific OA characteristics that highly contribute to the highest level of PfMM. This allows organizations with limited resources to precisely concentrate on the characteristics that will improve performance and achieve PfMM.

2 Literature Review

2.1 Portfolio Management Maturity

According to PMI [7], Portfolio Management (PfM) aims to achieve strategic objectives through the centralised management of one or more portfolios. PfM has been referred as a means to deliver value to organisations with its abilities, at the long-term organisational level, in selecting the right projects, maximizing resource allocation, measuring and evaluating portfolio success, strategic alignment and balance, and value maximization of project/program investment [8-10]. Furthermore, strong strategic portfolio execution is required for maintaining organisational competitiveness [2, 7, 11]. To implement PfM successfully, a supportive environment with impacting factors in PfM implementation must be identified [8]. These may include, but not limited to, organization culture and structure, law limitations, government or industry standard, infrastructure, human resources, staff management, company task authorization system, market condition, commercial database and project management information systems. Any changes to these factors will affect the implementation of PfM positively or negatively. Nevertheless, changes are inevitable and require responsively adaptive management for PfM to remain effective.

As benefits of PfM, such as organizations become more flexible, impulsive, dynamic, innovative, creative, communicative, strategic oriented, efficient and motivated [12], have been increasingly realized, many organisations aim to maximize and sustain the PfM implementation by achieving the high level of PfM maturity (PfMM). PMI [13] identifies five categories of PfMM: ad hoc, getting started, structured and improving, established and optimized for continuous improvement (Figure 1).

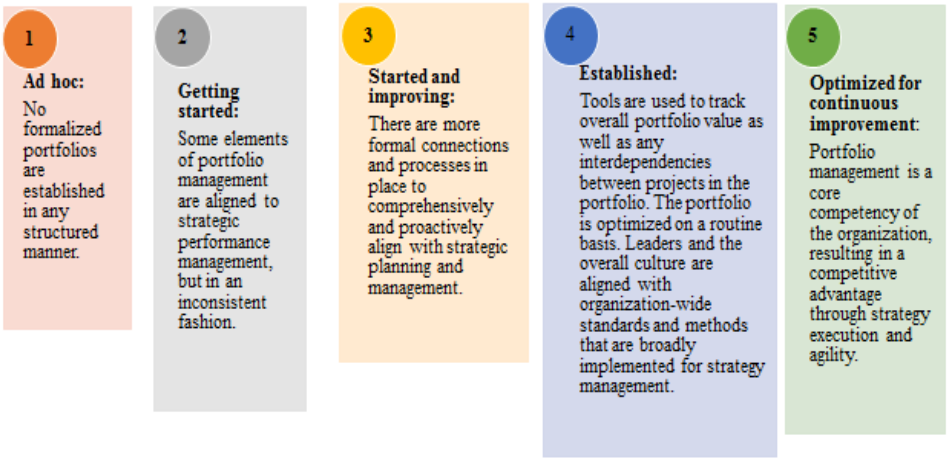

Fig. 1. Portfolio Management Maturity (Adapted from PMI [13], p5)

Young et al. [14] state that organisational governance, stakeholder management, management control, risk management, benefits management, portfolio, financial management and resource management are the key attributes to PfMM. In their study, PfMM was carefully examined using the Australian Federal Government as a case study. Their study shows that not only financial management and resource management were considered as the only key focused areas in PfMM, but also generic attributes of roles and responsibilities, experience, capability development, planning and estimating and scrutiny and review that are highly sensitive factors to PfMM. The results showed in [14] are aligned with a study by Pennypacker (2002 cited in [12] p. 241) that attaining PfMM relies on a set of knowledge, skills, tools, and techniques applied to a collection of projects in order to meet or exceed needs and expectations of an organization's investment strategy.

2.2 Linking Portfolio Maturity to Organisational Agility

As stated by PMI [15], the success of organisations depends on the ability to adapt quickly in response to changes to sustain competitive advantage. Organizational agility (OA) is the ability to responsively accommodate changes and implement required actions. Most important characteristics of OA as identified by PMI [15] include flexibility and adaptability, open communication, openness to change, empowered team members, experiential learning, rapid decision making, and a strong customer focus. Successful implementation of OA generally requires continuous communication, collaboration, engagement and support within organisations.

Martinsuo and Lehtonen [16] suggest that there is a link between PfM and organisational performance. PMI [7, 11] states that organisational resources are a primary input for PfM and strategic changes driven by the integration of organisational planning and business analysis enable the planned portfolios to support strategic objectives. Heising [17], on the other hand, views PfM as a strategic role that enables organizations to respond and adapt to changing environmental conditions by monitoring and altering the project portfolio. Killen and Hunt [9] discover connections between PfM and OA in supporting organisations with responsive decision making and resource allocation as well as building dynamic capability at the organisational level. It is also found that OA supports strategic flexibility by enabling organisations to anticipate, identify, develop and implement change and investment strategies

that are aligned with strategic objectives. Nevertheless, it has been minimal research on how characteristics of OA interact with different levels of PfMM. This research, therefore, is to examine the interactions between the studied PfMM levels and characteristics of OA to gain more understanding and maximizing any positive impacts resulted from the interactions.

3 Research methodology

The categorical data were analysed from 36 PfM practitioners who aimed at improving PfMM through the application of OA. The collected data were coded to conduct a nonlinear canonical correlation analysis (NLCCA) or known as OVERALS. The purpose of OVERALS analysis is to examine the associations between two or more sets of categorical variables (nominal or ordinal scaling level) [18] to introduce an integrative analysis of non-linear relations between variables [19]. The formulation of OVERALS was conducted using the SPSS statistics software.

The data collected in this analysis were categorised into three sets containing 21 variables as inputs to perform OVERALS. The first data set was the categories of PfMM identified in the respondent's organisation. The second and the third data sets were OA characteristics which had been grouped into the process and people drivers in relation to the high agility focus stated by PMI [11]. These sets of data identified the views of respondents in the existing OA characteristics in organizations to support PfMM. The three data sets are demonstrated in Table 1.

Table 1. Variable Coding

Set	Variable	No of categories	Variable type	Category symbol
1. Portfolio Management Maturity (PfMM)	PfMM category	5	Nominal	PfMM
2. Organisational Agility Characteristics (People)	Flexible and adaptable	3	Ordinal	PP1
	Open communications	3	Ordinal	PP2
	Open to change	3	Ordinal	PP3
	Self-aware and honest	3	Ordinal	PP4
	Customer-orientated	3	Ordinal	PP5
	Focused on talent development	3	Ordinal	PP6
	Committed to agility	3	Ordinal	PP7
	Empowered team members	3	Ordinal	PP8
	Catalyst leadership	3	Ordinal	PP9
	Continuous learning from experience	3	Ordinal	PP10
3. Organisational Agility Characteristics (Process)	Transparency in decision making	3	Ordinal	PC1
	Rapid decision making	3	Ordinal	PC2
	Decentralized decision making	3	Ordinal	PC3

	Action-based	3	Ordinal	PC4
	Agility recognised as a team competence	3	Ordinal	PC5
	Effective methods of rapid knowledge transfer	3	Ordinal	PC6
	Clear guidelines for tailoring standardised processes to suit the size and type of project	3	Ordinal	PC7
	Effective environmental screening	3	Ordinal	PC8
	Appetite for risk	3	Ordinal	PC9
	Active Governance	3	Ordinal	PC10

The results obtained from OVERALS included the loss index, eigenvalues, fit index and component loading index. The component loadings were demonstrated within a two-dimensional graph for each plotted variable. The plot of centroids was generated to view categories under each variable.

4 Research findings

After the research data collection, individual respondents were carefully assessed on their experience in organisational agility through the use of filtering questions to ensure the validity of responses. Thirty-six out of 50 who had completed the research questionnaires were satisfied with the screening criteria. Descriptive statistics were employed to demonstrate the percentages of respondents according to their organisational roles. The percentage of each respondent category is shown in Figure 1 below. The major categories of respondents in this research were business managers (33%), project managers (17%) and corporate executives (14%) respectively.

OVERALS was performed on the collected data to identify and graphically present relationships between OA characteristics and PfMM as well as the relationship formed between categorial parameters used within the studied variables. OVERALS as demonstrated in Table 2 presented loss values, eigenvalues and fit values. The fit and loss values were used to confirm the degree of NLCCA solution to the optimally quantified data with respect to the association between sets [18]. Loss values indicated the percentage of variation in object scores that were not explained by the current model [20]. Whereas the average loss values of the two dimensions are 0.058 and 0.227 respectively, the average loss over sets is 0.285. This indicated the average loss or the difference between the perfect and the modelled relationship. The maximum fit value presented equals the number of dimensions and indicates that the relationship is perfect.

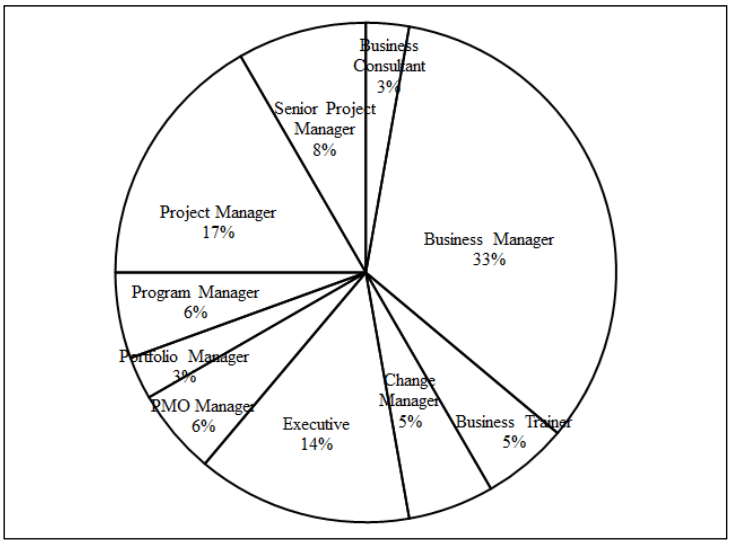

Fig. 2. Percentage of Respondents in Category

Table 2. OVERALS Summary of Analysis

		Dimension		Sum
		1	2	
Loss	Set 1	.044	.233	.277
	Set 2	.031	.299	.330
	Set 3	.099	.149	.248
	Mean	.058	.227	.285
Eigenvalue		.942	.773	
Fit				1.715

The eigenvalue in each dimension was the result of 1 minus the average loss of the dimension. The result of eigenvalue shows not only how much relationship is presented in each dimension, but also the importance of the dimension. The value of eigenvalue can determine the percentage of actual fit of the dimension over the fit value in the "Sum" column, i.e. the actual fit among the sets of variables in the first and second dimensions are 0.942/1.715 = 0.549 and 0.773/1.715 = 0.451 respectively which are not necessarily high. The maximum potential relationship over sets associated to the current model can be calculated by dividing the fit value with the total dimensions. The analysis shows that the maximum potential relationship of the current model is 1.715/2 = 0.858. Canonical correlations (ρ) of more than two data sets per dimension were obtained from the given formula below:

$$\rho_d = ((K \times E_d) - 1)/(K\text{-}1)$$

Where d is the dimension number, E is the eigenvalue and K is the number of sets.

The correlations of the first and second dimensions were calculated as and 0.91 and 0.66 respectively. The correlation values suggest that the positively strong relationships between PfMM and OA characteristics were found within the studied groups both in Dimensions 1 and 2. As a result, it can be interpreted that the application of overall OA characteristics to support PfMM were significant to organisations at PfMM categories.

The examination of the weight load of variables is presented in Table 3. The variables with the highest contribution to the Dimension 1 were PP3 (0.604) and PC3 (0.282). The highest contribution to the Dimension 2 were PfMM category (0.843), PP9 (0.804), PP10 (0.716), PP5 (0.579), PC8 (0.565) and PC6 (0.400) respectively.

Table 3. The Weight Load of Variables

Set		Dimension 1	Dimension 2
1	PfMM Category	0.100	**0.843**
2	PP1: Flexible and adaptable	-0.280	-0.134
	PP2: Open communications	-0.428	-0.047
	PP3: Open to change	**0.604**	-0.181
	PP4: Self-aware and honest	-0.469	-0.026
	PP5: Customer orientated	-0.022	0.579
	PP6: Focused on talent development	-0.093	-0.723
	PP7: Committed to agility	-0.247	-0.004
	PP8: Empowered team members	-0.470	-0.002
	PP9: Catalyst leadership	0.068	**0.804**
	PP10: Continuous learning from experience	0.053	**0.716**
3	PC1: Transparency in decision making	-0.386	-0.211
	PC2: Rapid decision making	-0.026	-0.101
	PC3: Decentralized decision making	**0.282**	0.193
	PC4: Action based	-0.516	0.107
	PC5: Agility recognised as a team competence	-0.208	0.131
	PC6: Effective methods of rapid knowledge transfer	-0.290	0.400
	PC7: Clear guidelines for tailoring standardised processes to suit the size and type of project	0.103	-0.034
	PC8: Effective environmental screening	0.019	**0.565**
	PC9: Appetite for risk	-0.153	0.086
	PC10: Active Governance	-0.253	-0.778

The component loading in Figure 3 below shows the plot of component loadings for the collected data. The component loadings presented are equivalent to the Pearson correlations between the quantified variables and the object scores. This means the distance from the origin to each variable point indicates the significance of that variable [18]. The line joining the origin and the coordinate of component loading is called the coordinate vector. The strength of association between the two studied variables can be determined from the angle between the coordinate vectors of the variables. The smaller the angle, the higher the strength of the association and vice versa.

As demonstrated in Figure 1, the variance of PP4, PP8, PP1, PfMM and PC10 were the most explained variables respectively as their vector lengths were the greatest among the studied variables. On the other hand, PP5, PP2, PP3, PC2 and PP7 were the least explained variables by NLCCA. From the angle between the coordinate vectors, it was found that PP4,

PP8, PP1, PC1, PC9, PP7, PP3, PP2 and PP5 formed a major cluster. On the other hand, PfMM and PC3, as well as PC8 and PP9, also aligned to form smaller clusters.

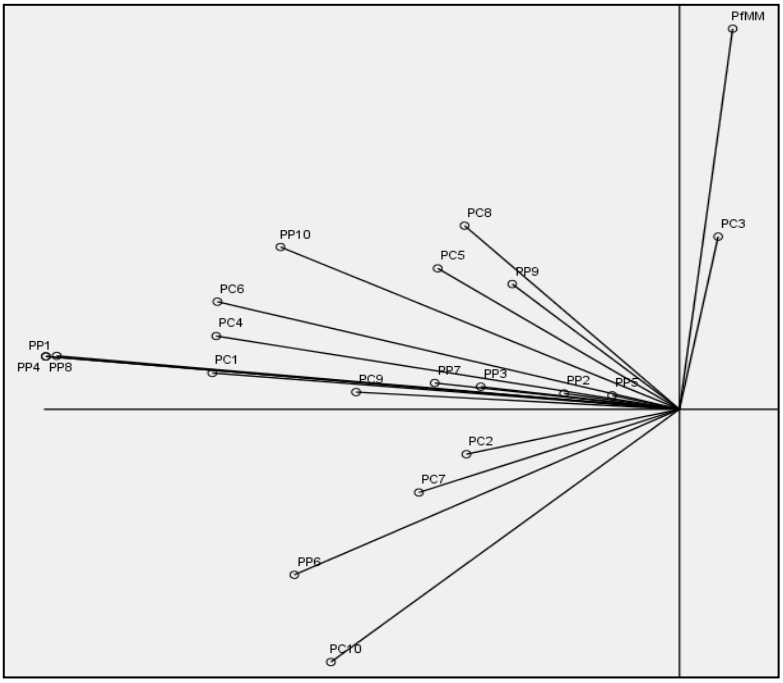

Fig 3. Component Loadings

It was observed in the Centroids plot (Figure 4) that most of the High degrees of OA characteristics, especially PP9, PC8 and PC5, aligned to form a significant cluster with the PfMM Categories 3 (Started and improving) and 4 (Established). On the other hand, the PfMM Category 1 (Ad hoc) formed a cluster with PC10.

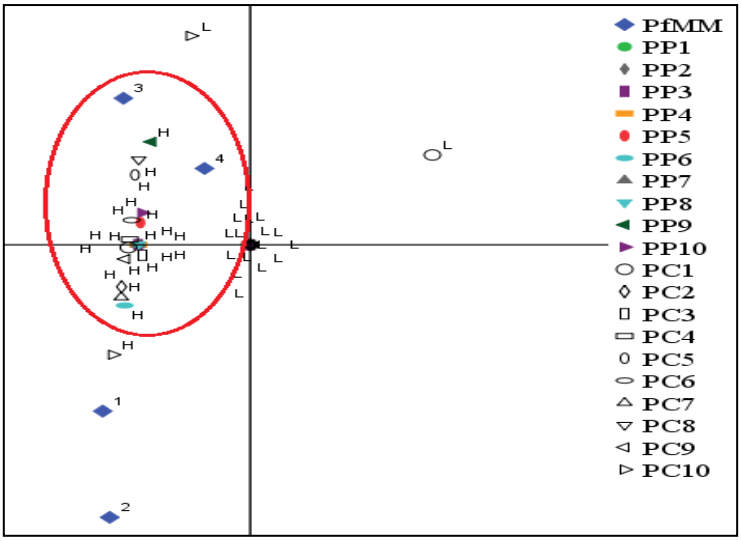

Fig. 4. The Centroids Plot

It was also found that the PfMM Category 5 (Optimized for continuous improvement) as well as the Medium degree variables of OA characteristics, regardless the significance of these variables, were plotted at a distance farther away from other PfMM Categories and the High degrees of OA characteristics variables (see Figure 5). The variables aligned themselves and formed different clusters indicating different sets of relationships without any PfMM Categories.

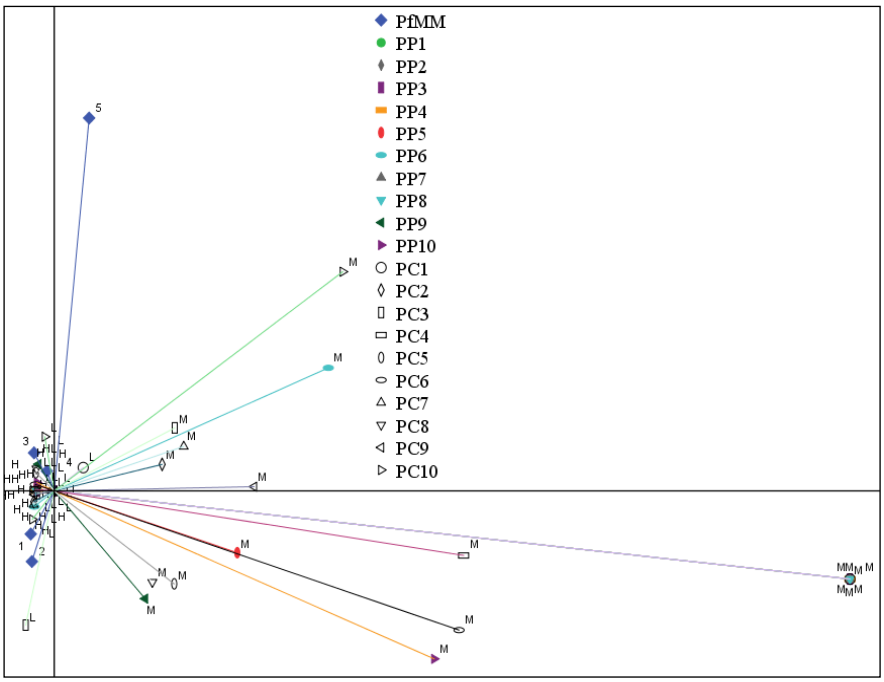

Fig. 5. The Centroid Plot of Distant Variables

5 Conclusion and Recommendations

The organizational agility and portfolio management maturity concepts have been developed to improve organizational performance and adapt to external pressures. Agility improves organizations to sustain their competitive advantage by increasing responsiveness in managing and making business decisions. Whereas, portfolio management maturity (PfMM) aims to deliver value to organizations with its abilities, at the long-term organizational level, in selecting the right projects, maximizing resource allocation, measuring and evaluating portfolio success, strategic alignment and balance, and value maximization of project/program investment. This research provides a significant examination of the relationships between the existing organizational agility (OA) characteristics and its support to PfMM. Three sets of data contacting 21 variables of PfMM and OA were carefully examined using canonical analysis. The results showed a significant positive strong correlation between PfMM and OA characteristics within the studied groups. The research also found various combinations of the OA characteristics constructed at different levels of PfMM, and there are specific OA characteristics that highly contribute to the highest level of PfMM. This allows organizations with limited resources to precisely concentrating on the implementation of PfM and on the characteristics that improve

performance and achieve PfMM. This may require further research to be undertaken to identify these characteristics in different organization size and sectors. Furthermore, it is recommended to extend the investigation into differing environmental settings of OA and PfMM to generalise the research findings.

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