Exploring ad-hoc portfolio management: Does it work, and is it the flexibility that supports project portfolio management?

Adrian Hepworth[a], Fotios Misopoulos[a] , Vicky Manthou[b], Ronald Dyer[a], Roula Michaelides[a]

[a]*University of Liverpool, Management School, Liverpool, UK L69 7ZH*
[b]*University of Macedonia, Egnatia 156, Thessaloniki, Greece 540 06*

Abstract

This work researched ad hoc decision making practices in multiple project environments. The aim of this research was to analyze the organisational motives and organisational structure that influences ad hoc behaviors and practices and explored the factors facilitating or impeding the practice. The methodology comprised both quantitative and qualitative data collection through a global web-based questionnaire survey and face-to-face semi-structured interviews. The study found that there are links between ad hoc, flexibility and the decision making process that influence organisational performance both positively and negatively. Flexibility was also found to be a key tool in leadership traits. The findings also indicate that successful organisations are efficient in management processes, implementing leadership and resource training programmes, have clear vision and are climbing the maturity ladder. Furthermore the results influenced the development of an agile, flexible decision making buffer model.

Keywords: Ad hoc decision making; Project Portfolio Management; Flexibility; Buffer model; Multiple project environments

1. Introduction

The purpose of this article is to research and discuss ad hoc and unprincipled project and portfolio management practices that are widely used in civil infrastructure and the oil and gas industries[1]. Ad hoc refers to reactive and flexibility over decisions and perhaps best adopted by tacit knowledgeable actors, whereas proactive might be a conscious stance and time consuming. Therefore, "ad hoc portfolio management" might be defined as reactive in decision making by experienced portfolio managers that can make a judgment and change direction when real options and opportunities are available. For the purpose of this research the authors define ad hoc management practices as unplanned reallocation of critical resources, and off-the-cuff decision making practices without considering the wider picture. Through research and an empirical literature review into project portfolio management concepts, the authors are looking to discern ad hoc management practices and diverse management methods that plague organisations. These management gaps and perceptions in project and portfolio management are widely used in the approaches to decision making and how resources are allocated, and are the key areas of this research[1]. Organisations undertake projects as the driving force to achieve the organisational business objective in the competitive business environment, and thus project success is a key factor for business survival[2]. Project portfolio management balances the links between multiple project environments, strategic resource allocation and effective communication[3]. Organisations undertaking initiatives are doing so to improve growth, sustain the competitive advantage and elongate new business success[4]. And thus, many organisations have adopted project portfolio management (PPM) or are in the process of establishing a project portfolio centralized unit (the project management office) that manages the projects sharing some of the same characteristics such as, resources and project methodologies[5].
The intended purpose of the research is to identify positive and negative factors that share common concepts and practices and to evaluate if some of these methods hold merit in the approach. It is also to address these methods and applications for organisations to use for managing in a multiple project environment, which invariably lead to project successes and failures alike. Project portfolio management is in its infancy as a discipline and still in its research and transition stage for identifying best practices and approaches for best application[6]. And this makes it difficult for fixing firm ground rules and applying these across all industries, hence many protocols are not in place. The lack of rigor in portfolio management frameworks and models may be attributed to the transitional stages and therefore develop ad hoc approaches where rigor of process is unclear[7]. Organisational needs vary, however an unambiguous flexibility in the PPM approach that strategically embarks on undertaking projects that improves overall organisational performances and profitability is the main objective of most[8]. And thus, this article attempts through research to bring more insight into the merits of ad hoc management practices.

1.1. Research Questions and Objectives

The research question is: Does ad-hoc portfolio management work, and is it the flexibility that supports project portfolio management? This research question is addressed through the following four research objectives:
i. To determine the motives of organisations for adopting ad-hoc approaches in managing in multiple projects environments.
ii. To identify the type of organisational structure that is more suitable to adopting ad-hoc approaches for project portfolio management.
iii. To explore the factors that facilitates or impedes the adoption of ad-hoc approaches for project portfolio management.
iv. To find out if ad hoc portfolio management works and to determine the benefits and drawbacks to organisations of adapting ad-hoc approaches for project portfolio management.

2. Theoretical Framework

Ad hoc decision making in project portfolio management has many elements and variables of influencing factors, in both positive and negative ways. Fundamentally, resource allocation is a key scholar discussion theory for successfully delivering projects, such as Engwall and Jerbrant[9] suggesting that resource allocation syndrome as the number one multiple project environment inhibitor; while Elonen and Artto[1] suggest that the lack of commitment, unclear roles and responsibilities of leaders, and authority problems between projects are inhibiting factors. Both sets of authors suggest the allocation of resources is a critical undertaking and the authors agree that there are problems in the decision making processes. The decision making and resource allocation theory is reflected in this research project and is tested for correlation theories using a number of dimensional angles, such as organisational knowledge, motivation and structure. Characteristics of these theories are linked in the study done by Shepherd et al.[10], where the findings suggest that organisations learn from failures and move forward; however individualisms, ability to transcend, and learning from their failures tend to overlook the benefits. In addition scholars such as Blichfeldt and Eskerod[5] and Buys and Stander[8]

discuss the positive theories of implementing and committing to a PPM and PMO system, however Hobbs and Aubry[11] equally discuss the negative impacts of the PMO and decision making, and again this reflects the current research. The literature review interpretation identifies thirteen theoretical variables with similarities and correlations. The variables are the results of previous research and for further testing in this research. The variables influence action, but the two key themes of action 'proactive or reactive' generates conscience or consequence. The thirteen variables were then tailored around the four research objectives that are the gaps and influencers in the critical decision making process, and served as the basis for the interview and survey questions. These variables are: Organizational Structure, Commitment, Leadership, Decision Making, Resources, Knowledge, Culture, Corruption, Impacts, Geographical Location, Flexibility, PPM System, and Ad Hoc Decisions.

3. Research Methods

3.1. Research Approach

The strategy of the research design was initiated during the literature review that developed the theoretical framework and influenced the research model for conducting the research. The approach used for an in-depth analysis leading to the model presented in Figure 1 was based on previous research approaches as used by Killen et al.[6], Muller and Turner[12] and Shepherd et al.[10]. The approach used a web based quantitative questionnaire as the quantitative research approach, and purposive semi structured interviewing as the qualitative approach for an in-depth motivation analysis to complement quantitative data[13,14]. Thus, the research objectives were achieved using a combination of mixed approaches and methods that directly led to the empirical results; the authors believe this was the optimum choice of approach and methods for this specific research[13]

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3.2. Sampling

The aim and target for the questionnaire was to reach as many professionals as possible in the area of multiple project environments. Sampling units were identified and made up from various willing participant project management groups, communities, organisations, and individual project management respondents[13]. The primary sampling criteria and sampling units for this research were targeted online. The web-link to the survey was posted to many project management LinkedIn Communities, and to key members in the Association of Project Management (APM). In addition an introductory email was compiled that was sent to more than two hundred and fifty Project Management Institute (PMI) Chapters in over seventy countries. In addition the International Project Management Association (IPMA) groups were approached. Furthermore the questionnaire was distributed to a number of University of Liverpool Master's communities and to the researchers' social network contacts. One hundred and fifteen people responded to the questionnaire, out of which one hundred and twelve were usable respondent data.

The purposive interviewing sampling of thirteen professionals was developed with a global participation in mind. Much of the interviewing was conducted online using Skype software, however local interviewing was conducted face-to-face[13]. The interviewees targeted for this research were from professional backgrounds that met the sampling criteria. Many of the interviewees were known to the researchers as former and current colleagues from both the civil infrastructure and oil and gas sectors that have worked and are currently working in a multiple projects environment.

To balance the qualitative and quantitative sampling both the interview and the survey questionnaire questions were similar in structure to ascertain a balanced data collection and evoke similar theories. And the identified thirteen variables were the basis for developing the questions for both the sampling process. To ensure the reliability of the data sets both samples were conducted in parallel. The validity of the data was a process of comparing the qualitative and quantitative data and cross-verification through a triangulation process using secondary data.

4. Analysis of findings

4.1. The Research Objectives Analysis of Results

The four research objectives used both quantitative and qualitative data collection and this structure was the research objective criteria. Analysis was conducted on each of the research objectives from the web based quantitative questionnaire data and further enhanced and aggregated with the qualitative interview data for

triangulation and cross verification which provides the primary individual results. Secondary data verified the findings[13].

4.1.1. Visualization network from qualitative data

The interview transcripts were processed through grounded theory analysis and examined line-by-line. This provided descriptive keywords and categories; this data was then inputted into a spreadsheet matrix and coded[15]. The coded data was further interpreted for links and themes that reduced and summarized the data into manageable theoretical codes and constructive variables (Charmaz, 2006 cited in [13], p.168). The conceptualized data was further aggregated into a network of interdependencies and visualization analysis that developed the visualization network (Fig. 1). The visualization network consists of key variables and subsets of variables; the analysis further strengthens the patterns, relationships and correlation coefficients and associations between the variables[13]. Although other visible connections between the variables in the visualization network diagram are suggestible, the connections have been considered appropriate for this research.

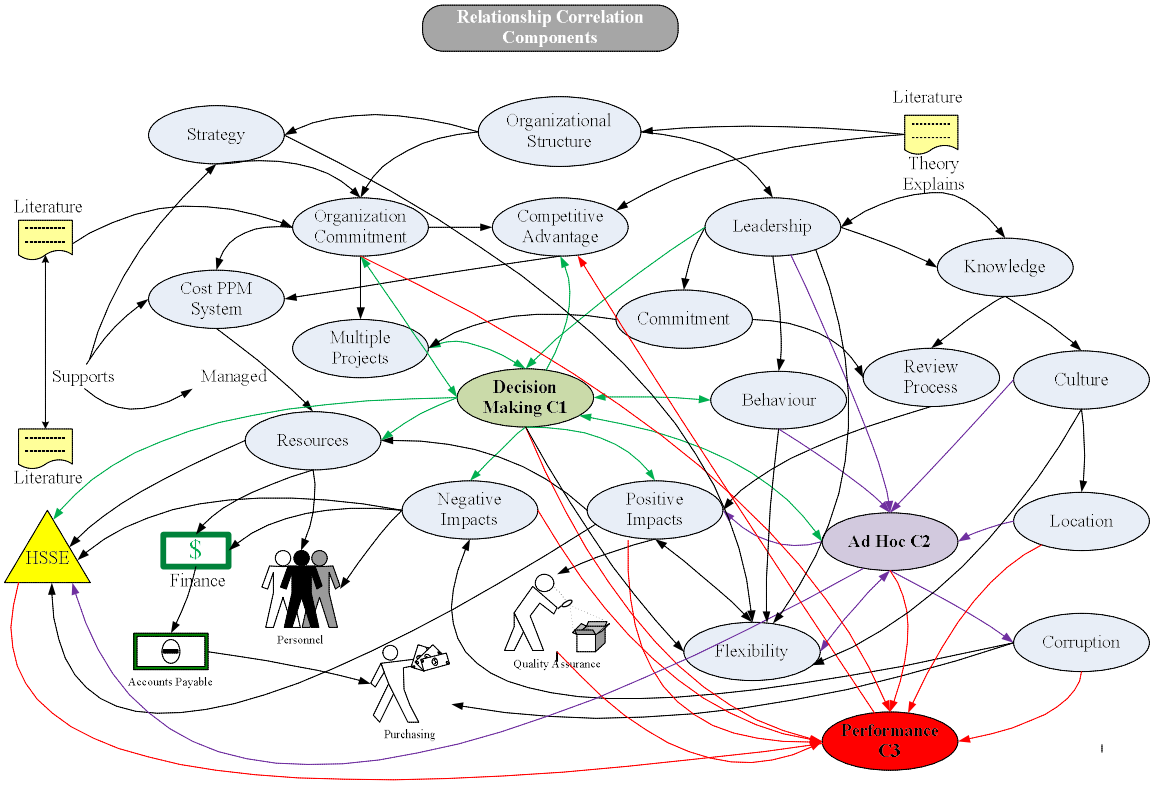

Fig. 1. Visualization Network, Correlation of Raw Relationships

The visualization network acts as a rich picture concept[16] and presents a multiple viewpoint platform for identifying the interactions and interrelationships between the variables. And interpreted from the visualization network, the variables influence a profound impact on performances. Therefore, organisational system networks might consider how proactive and reactive decisions impact their systems. The visualization network exposes the qualitative assumptions. To expose the quantitative assumptions, factor analysis (Table 1) and Cronbach coefficient reliability (Table 2) was performed to verify the quantitative data results. The comparatives and similarities of the qualitative and quantitative results complement each other in the discussion section.

4.1.2. Factor Analysis

Factor analysis was conducted using the questionnaire data. The results are presented below in Table 1 and Table 2.

Table 1. Factor Analysis

Dimensions	Factor	Eigenvalue	% of Variance	Cumulative	Communalities Variable
Organisation Motivation	Multiple Projects	3.458	14.407	14.407	0.697
	Commitment	2.493	10.388	24.795	0.732
	Resource Reviews	1.885	7.855	32.650	0.700
	Decision Making	1.554	6.477	39.126	0.775
	Ad Hoc	1.387	5.780	44.907	0.728
	Impacts	1.320	5.501	50.408	0.639
	Other Variables	1.250	5.210	55.618	0.727
Organisational Structure	Structure	1.115	4.647	60.264	0.768
	Efficiency	1.050	4.377	64.641	0.610
	Resource Allocation	1.003	4.179	68.820	0.554
	Commitment	0.891	3.712	72.533	0.618
	Knowledge	0.782	3.257	75.790	0.700
	Leadership	0.772	3.216	79.005	0.666
	Flexibility	0.693	2.888	81.893	0.774
Factors for Adoption	Culture	0.634	2.642	84.535	0.782
	Resource Impact	0.593	2.470	87.005	0.748
	Impacts	0.514	2.141	89.146	0.640
Benefits & Drawbacks	Benefits	0.474	1.973	91.119	0.674
	Drawbacks	0.458	1.909	93.028	0.772
	Team Benefits	0.409	1.704	94.732	0.670
	Leadership Traits	0.381	1.587	96.319	0.595
	Cost Impacts	0.346	1.442	97.761	0.621
	Decision Making	0.293	1.221	98.982	0.724
	Leadership Style	0.244	1.018	100.000	0.602

Table 2. Dimension Validity from the Questionnaire (Cronbach Coefficient Reliability)

Dimensions & Research Objectives	Number of Variables per Dimension	Mean	Variance	Std. Deviation	Cronbach's Alpha
Organization Motivation	8	7.5625	9.185	3.03072	0.744
Organizational Structure	8	8.5099	9.315	3.05209	0.740
Factors for Adoption	5	9.4821	9.405	3.06677	0.737
Benefits & Drawbacks	8	9.6696	9.250	3.04142	0.711

The factor analysis verifies the dimensionality of the research variables and improves the coefficients factors; in addition the factor analysis tests the internal reliability of the questionnaire[13]. The communalities variables indicate the strength of the individual variables and further strengthen the dimensional driving variables for using ad hoc practices. These indicate and support the findings during the correlation coefficient dimensional analysis following below, that organisational motives and structures drive ad hoc practices, and benefits and drawbacks are the assumptions from these factors[13].

4.1.3. Association between the variables

The four dimensions (research objectives) were further analyzed using contingency tables and chi-square analysis to test two sets of dimensions and to test the association between the two sets of variables. The two variables tested were organisational motives tested against organisational structure (Table 3), and impeding factors tested against benefits and drawbacks (Table 4). The chi-square test further supports the theory identified during the factor analysis test. The results indicate the probability observed outcome from the survey would have occurred in the absence of any true association between the two variables. Further suggesting organisational motivational factors are more likely to influence ad hoc management factors than organisational structure[15]. This is further supported from the qualitative data collected during the interviewing. The P value (Table 4) suggests the value as insignificant because it is above the mean value of 0.05. And thus, suggesting poor or no association between the two variables, and again is supported by qualitative interview data[13].

Table 3. Contingency table & chi-square test dimensions 1 & 2

Dimensions	Positive Effect	Negative Effect
Organisational Motives	60.25% (50.7)	26.67% (36.2)
Organisational Structure	48.74% (58.3)	51.24% (41.7)

( ) Expected value – Chi-square test Mean 0.05
Probability (P) Value = 0.004

Table 4. Contingency table & chi-square test dimensions 3 & 4

Dimensions	Positive Effect	Negative Effect
Impeding Factors	55.31% (60.1)	44.02% (39.2)
Benefits & Drawbacks	65.38% (60.5)	34.61% (39.4)

( ) Expected value – Chi-square test Mean 0.05
Probability (P) Value = 0.161

4.1.4. Correlation Coefficients Tested Against the Individual Dimensional Variables

To further refine and test the questionnaire results correlation coefficient analysis was conducted using the four dimensional variables to test association between the dimensions. The results from the correlation dimensional analysis indicate the following findings (Table 5).

Table 5. Correlation Significance of Variables

Dimension Variable		OM	OS	FA	BD
Organizational Motivation	(OM)	-	0.684	0.274	0.903
Organizational Structure	(OS)	0.684	-	0.377	0.902
Factors for Adoption	(FA)	0.274	0.377	-	0.033
Benefits & Drawbacks	(BD)	0.903	0.902	0.033	-

There is a significant correlation coefficient value (0.903) between the organizational motivation (OM) variable and the benefits and drawbacks (BD) variable. Furthermore, this is repeated with the organizational structure (OS) variable and the benefits and drawbacks (BD) variable with a coefficient value of 0.902. In addition, there are strong relationships between the OM and OS variables, suggesting the correlation coefficients are much stronger when individualized into their own dimensional factors. Additionally, they are suggesting organization motives and structures and the variables within these dimensions (research objectives) are the driving factors for ad hoc practices; and moreover the benefits and drawbacks are the results from these driving factors[13].

4.1.5. Regression Analysis and ANOVA

Regression analysis was conducted to further test the association between the dimensional variables. Organizational motivation was used as the dependent variable and the other three dimensions as the independent and common variables to test the linear regression analysis. The results from the regression analysis indicated in the summary Table 6 suggest, Adjusted R-Square (Adj. R2) and accuracy is 80.7%, indicating that the percentage of variance is explained by the regression model[17].

Table 6. Summary of regression Analysis

R2	R	Adj. R2	S.E. of Estimate
0.903	0.950	0.807	12.511

Furthermore the ANOVA model (Table 7) suggests the regression significance F confidence fit is 0.049; a greater value than 0.05 would suggest the data would not fit the model or the data is partially unreliable, the

Table 7. ANOVA Model

Source	Sum Sq.	D.F.	Mean Sq.	F	Prob.
Regression	4393.438	3	1464.479	9.355	0.049
Residual	469.612	3	156.537		
Total	4863.051	6			

accuracy of the data is 90-95% true. Moreover this can be interpreted with the probability significant factors (Table 8) FA and BD having a greater probability of accuracy than OS.

Table 8. Regression Coefficients

Source	Coefficient	Std Error	Std Beta	-95% C.I.	+95% C.I.	t	Prob.
Intercept	154.359	26.947		68.602	240.117	5.728	0.011
OS	0.609	0.286	0.470	-0.302	1.521	2.129	0.123
FA	1.383	0.267	1.879	0.533	2.234	5.178	0.014
BD	-2.395	0.525	-1.524	-4.064	-0.726	-4.567	0.020

5. Discussion of the Research Objectives

The research question was: "*Does ad-hoc portfolio management work, and is it the flexibility that supports project portfolio management"?* The answer to this research question is that flexibility in the decision making process is needed in projects to sustain performance. In addition, ad hoc decision making works in certain circumstances and situations that do not merit process or impact other areas. Also, organisations appear to be more successful with projects and with the decision making process when climbing the maturity ladder[18].

5.1. Organisational Motives

This research objective sought to determine the motives of organisations for adopting ad-hoc approaches in managing in multiple projects environments. The research finding for organisational motives indicates that commitment to a PPM system, a robust methodology and regular review sessions are important. Furthermore the findings suggested that process management and organisation maturity moderates the need for ad hoc decisions, however flexibility in the process was found to be an important factor. Also ad hoc decisions combined with flexibility in the decision making process were found to be significant when underpinning organisational policy, and furthermore, ad hoc decision making has a positive impact. Fast pace decision making was also found to be important in certain situations, linking ad hoc practices to flexibility. Flexibility was also found to improve project culture and performances. However, change in scope or activities were found to be a key significant influencer to poor ad hoc decision making. While, the literature supports the majority of the findings in this study, a finding which does not appear to have been captured in the literature is that ad hoc decisions and flexibility would appear to be linked.

5. 2. Organisational Structure

This research objective sought to determine the type of organisational structure that is more suitable to adopting ad-hoc approaches for project portfolio management. There was no single organisational structure identified that would support adopting ad hoc management approaches. However, it was found that organisations of any structure and type not moving towards maturity is more prone to using ad hoc methods to achieve the objectives. This research finding also indicates that flexibility and an ad hoc approach in leadership style is important and improves performance. Project and Process management were found to be important in controlling decisions and reducing the need for ad hoc practices. The management of resources was found to be significantly inefficient with a high percentage; 86% of questionnaire respondents suggested that there were significant gaps in the management processes. And top management was found to be uncommitted, lacked knowledge and lacked ability to mitigate resource needs, however lessons learned from other sectors and past experience was found to be an important factor. The majority of respondents agreed outsourcing for talent management was a key tool. Moreover leadership behavior was found to be important to project performance; and training programmes were found to be critical to the organisations sustainability. The literature review supports most of the findings; however the link between flexibility, ad hoc decisions and performance is an addition to the

literature.

5. 3. Factors that Facilitate or Impede

This research objective sought to explore the factors that facilitate or impede the adoption of ad-hoc approaches for project portfolio management. The research finding suggested that, poor process management and poor project vision were significant facilitators to ad hoc approaches. It was also found that geographical location and leadership style impact the project delivery, and culture significantly impacts project successes. Furthermore leadership style and approach was found to be very important in new geographical locations. Moreover it was found that a flexible roadmap and long term commitment to support in new locations with standardization of processes was important. In addition, it was found that flexibility in the decision making process in new locations was critical to success. Resource training programmes at all levels; from senior management to site resources were found to be a critical success factor. It was also found that the Civil Infrastructure sector is twice as likely to adopt ad hoc approaches to the Oil and Gas sector. The reallocation of resources was found to be the key influencing factor for ad hoc decisions, and 93% of survey questionnaire respondents suggested that, unplanned resource movements were the cause. Most of the findings align with the literature review; however the finding that Civil Infrastructure is twice as likely to use ad hoc approaches to that of the Oil and Gas sector appears to be a new significant finding.

5. 4. Benefits & Drawbacks

This research objective sought to find out if ad hoc portfolio management works and to determine the benefits and drawbacks to organisations of adopting ad-hoc approaches for project portfolio management. The findings for benefits and drawbacks to using ad hoc approaches suggested that, although a significant number of questionnaire respondents suggested that ad hoc practices had considerable drawbacks, a high number supported the theory that ad hoc decision making has merit based on project successes. Furthermore, flexibility approaches were found to be the key criterion in the decision making process. However, organisational and leadership structures has strong motives for adopting both flexibility and ad hoc decision making; and thus, was found to be important in project and organisation performance. Moreover, leadership traits and approaches were found to be important, however it was found that shooting from the hip appears to cause chaos with resource allocation. It was also found that leadership improved from knowledge taken from lessons learned and cultural learning, and in addition, training programmes were again deemed important. It was found that the PMO is not impeded by cost, however it lacks clear vision at all levels. Also, there was a clear lack of commitment towards the PMO in terms of authority and governance across all portfolio projects. However the PMO was found to be useful for managing resources and monitoring projects. Moreover organisational maturity was found to be a significant factor to overall performances. Ad hoc decision making was found to have merit if used as a flexibility tool in certain situations. Another finding was that leadership behavior plays an important role in emerging markets, and indicates the need to find best supporting decision making practices through development programmes. The majority of the findings are supported in the literature, however ad hoc decisions having merit and used as a flexibility tool appears to be a new finding.

5.5. Additional Findings from the Combined Quantitative & Qualitative Data Aggregated

Further indirect emergent results from the aggregated data support the direct findings and give insights into other influencing factors, such as communication and interpersonal skills that reflect positively and negatively in the decision making process[19]. The researchers used triangulation to cross verify and analyze the findings, and this provided other areas of the results to investigate, such as the effects of communications and interpersonal skills in the decision making process[20]. From the analysis, the common dominating factor between all the variables, constructs and findings is communication[21]. However for communication to be successful, organisational structure (policy and procedures) and leadership motives are needed to govern and interpret how communication is communicated in the decision making process[22]. The findings also suggested that introvert or extrovert communication traits should play no formal part in the decision making process. Furthermore flexibility, the optimum theme and finding of this research, plays a major role in the interpretation and handling of the communication in the decision making process. An ad hoc or processed decision made by consensus according to these research findings is appropriate to the circumstantial need[23]. Theoretically, flexibility improves and optimizes performance and acts as the performance buffer. The authors developed a decision making conceptual model based on the objective results and findings of this research (Fig. 2). The flexibility buffer acts as a consideration before finalizing the decision process that may improve the performance of the decision[24]. The findings suggested that organisations and leadership must decide how much flexibility or "brittle" to allow in the decision making process. They further suggested that without some form of flexibility in

the decision process, performance would slow and projects would overrun in cost and time[24]. Furthermore the findings support the theory that, critical planning and capping the scope against change is a detrimental factor and influencer to ad hoc decisions[25]. Further suggesting that clear vision, a robust methodology and a roadmap will manage the change inhibitor factor, and reduce the need for off-the-cuff decisions, and the reallocation and movement of critical resources[26].

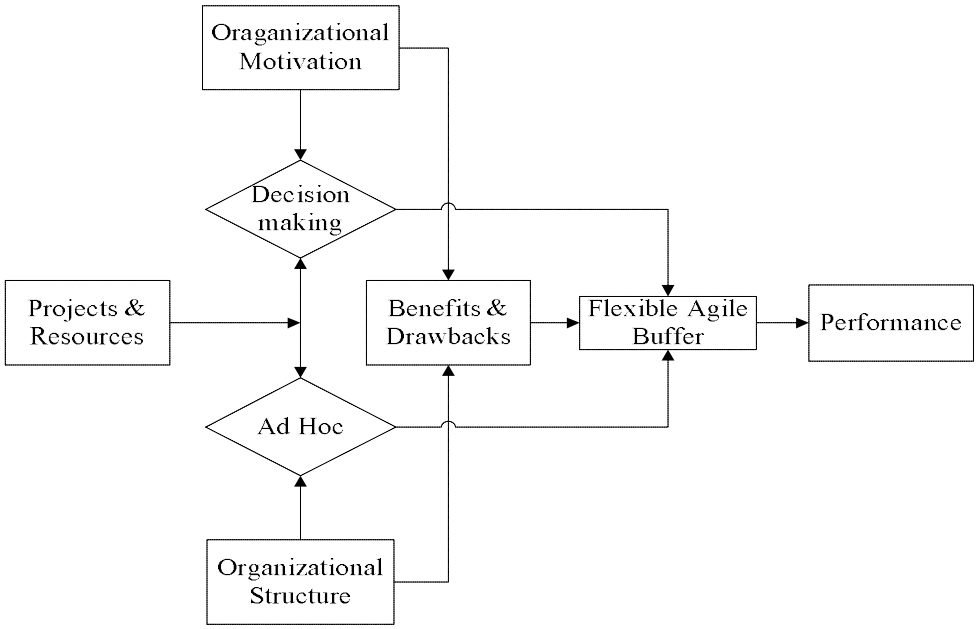

Fig. 2. The Conceptual Model: Decision Making Relationships & Buffer.

6. Conclusions

The research findings make some important contributions to the research area investigated in this study. The findings have provided new insights and understanding into the links between flexibility, performance and ad hoc decision making practices. The study has shown that flexibility and control of decisions are important to the project and organisational performance, and moreover ad hoc decision making appears to have merit in younger organisations. Flexibility has been a continuous pattern and theme of this research which suggests that a lot of decisions do not need rigidity and brittleness to improve performance; however suppleness within the rigor of decision making process may improve performances. Moreover, this leads to the development of the agile flexible decision making buffer model (Fig. 2) that influences the consideration of flexibility to improve performance, and is also an addition to the literature. This paper supports previous areas of research, in the areas of lessons learned and leadership. Also, a new finding suggests that, the civil infrastructure sector learn lessons from the oil and gas sector in the area of decision making management. This research further contributes and enhances the need for continuous training development programmes at all levels to enhance leadership styles and sustain performance awareness. Furthermore, this paper identified the significant inefficiencies and gaps in resource management that is influenced by ad hoc decisions. Moreover, there is significant evidence to the theories that organisational maturity improves sustainability, efficiencies and performance, through the implementation of robust methodologies and regular review sessions. And thus, the sooner organisations are aware that climbing the maturity ladder is important, all organisational performances will improve[18,27].

References

1. Elonen S, Artto K. Problems in managing internal development projects in multi-project environments. International Journal of Project Management 2003;**21**(6):395–02.
2. Shenhar AJ, Dvir D, Levy O, Maltz AC. Project Success: A Multidimensional Strategic Concept. Long Range Planning 2001;**34**(6):699-25.
3. Pjatje A, Seidel H, Wadman S. Project and portfolio planning cycle: project based management for multi-project challenge. International Journal of Project Management 1994;**12**(2):100–06.
4. Unger B, Kock A, Gemünden H, Jonas D. Enforcing strategic fit of project portfolios by project termination: An empirical study on senior management involvement. International Journal of Project Management 2012;**30**(6):675-85.
5. Blichfeldt BS, Eskerod P. Project portfolio management – There's more to it than what management enacts. International Journal of

Project Management 2007;**26**:357-65.
6. Killen CP, Jugdev K, Drouin N, Petit Y. Advancing project and portfolio management research: Applying strategic management theories. International Journal of Project Management 2011;**30:**525-38.
7. Turner J. Evolution of project management research as evidenced by papers published in the IJPM. International Journal of Project Management 2010;**28**(1):1-6.
8. Buys A, Stander M. Linking projects to business strategy through project portfolio management. South African Journal of Industrial Engineering 2010;**21**(1):59-8.
9. Engwall M, Jerbrant A. The resource allocation syndrome: the prime challenge of multi-project management? International Journal of Project Management 2003;**21**(6):403–09.
10. Shepherd D, Patzelt H, Wolfe M. Moving Forward from Project Failure: Negative Emotions, Affective Commitment and Learning from the Experience. Academy of Management Journal 2011;**54**(6):1229-59.
11. Hobbs B, Aubry M. A Multi-Phase Research Program Investigating Project Management Offices (PMO's): The Result of Phase 1. Project Management Journal 2007;**38**(1):74-86.
12. Muller R, Turner JR. Matching the project manager's leadership style to project type. International Journal of Project Management 2007;**25**(1):21-32.
13. Easterby-Smith M, Thorpe R, Jackson P. *Management research*. 4th ed. London: SAGE Publications; 2012.
14. Kothari CR. *Research Methodology: Methods & Techniques*. 2nd ed. New Delhi: New Age International (P) Ltd; 2004.
15. Abbott ML, McKinney J. *Understanding and Applying Research Design*. 1st ed. New Jersey: Wiley; 2013.
16. Monk, A. & Howard, S. (1998) 'Methods and tools, the rich picture: A tool for reasoning about work context', *Interactions*, **5**(2):21-30.
17. Nathans L, Oswald F, Nimon K. Interpreting Multiple Linear Regression: A Guidebook of Variable Importance. Practical Assessment, Research & Evaluation 2012;**17**(9):1-19.
18. Office of Government Commerce. Portfolio, Programme and Project Management Maturity Model (P3M3). 2011. Available from: https://www.gov.uk/government/publications/best-management-practice-portfolio/about-the-office-of-government-commerce
19. Project Management Institute. *A guide to the project management body of knowledge* (PMBOK® guide). 5th ed. Newton Square (PA):PMI; 2013
20. Homburg C, Klarmann M, Reimann M, Schilke O. What Drives Key Informant Accuracy? Journal of Marketing Research 2012;**49**(4):594-08.
21. Malbasic I, Brcic R. Organizational Values in Managerial Communications. Management: Journal of Contemporary Management Issues 2012;**17**(2): 99-18.
22. Chepkemei A, Biwott C, Mwaura J, Watindi RA. The Role of Integrity and Communication Ethics in Corporate Governance: A Study of Selected Companies in Uasin Gishu County, Kenya. Journal of Emerging Trends in Economics & Management Sciences 2012;**3**(3):233-7.
23. Kandemir D, Acur N. Examining proactive strategic decision-making flexibility in new product development. Journal of Product Innovation Management 2012;**29**(4):608-22.
24. Chavez T, Shachter R. Decision Flexibility. Research Report RR-98-5. Department of Engineering-Economic Systems. Stanford University 1998.
25. Zwikael O. Critical planning processes in construction projects. Construction Innovation 2009;**9**(4):372-87.
26. Olawale YA, Sun M. Cost and time control of construction projects: inhibiting factors and mitigating measures in practice. Construction Management and Economics 2010;**28**(5):509-26.
27. Kerzner H. *Project management best practices: achieving global excellence*. 2nd ed. New Jersey: Wiley; 2010.