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RELATIONSHIP BETWEEN PORTFOLIO MANAGEMENT AND PROJECT MANAGEMENT

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Abstract

The purpose of this research is to understand and quantify the impact of Portfolio Management on Project management and strength of interaction among them. A theoretical framework is proposed regarding the constructs of, Portfolio management (DPM) and Project Management (DIM) and the construct validity was established. The sample data from 65 firms were obtained through structured questionnaires. Structural equation modeling (SEM) was used to perform confirmatory factor analysis. Regression model was used to model the relationships between the constructs. The results showed that impact of Portfolio Management on Project management is signiicant.

Key words: *Project management, Portfolio management.*

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1. INTRODUCTION

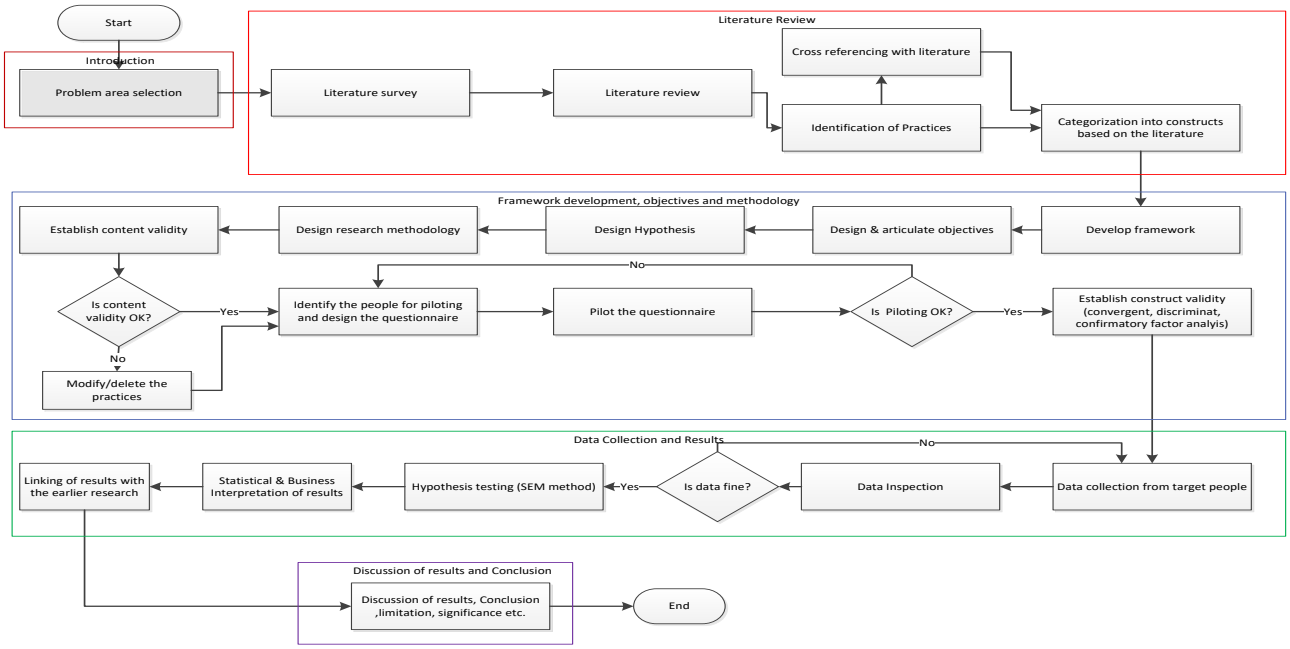
Project management:

Portfolio management :IT Portfolio Management is the combination of tools and methods used to measure, control, and increase the return on both individual IT investments and on an aggregate enterprise level in a desirable manner that meets the organization's business objectives without exceeding available resources or violating other constraints

(Kaur & Sengupta, 2011)conducted a research to understand the reasons for the failure of software. Their findings indicate that majority of the projects fail to meet their objectives due to poorly defined applications, miscommunication between business and IT, poor requirements gathering, analysis, lack of relationship between business and IT, and management costing U.S. businesses about $30 billion every year.

2. METHOD

The following picture describes the method followed to achieve the purpose of this research paper.



3. LITERATURE REVIEW

(Feeny & Wilcocks, 1998) suggested framework for planning in-house IT function to keep pace with changing needs of technology based on their research. The framework has nine core capabilities and how the core capabilities can be used to handle the challenges in IT exploitation in addressing Business & IT Vision, Design of IT Architecture and Delivery of IT Services. Some of the core capabilities like Business Systems Thinking (equivalent to Business Value Planning in the current research), Relationship Building, is involved in integrating the IS/IT effort with business purpose and activity. Business Systems Thinking addresses envisioning the business process that technology makes possible. Relationship building is concerned with getting the business constructively involved in IS/IT issues.

(Segars & Grover, 1998) conducted an empirical research to understand the impact of Strategic Information System Planning (SISP) on SISP success. The construct "Planning Capabilities" explains the need to understand business strategy and its information needs and ability to gain cooperation among user groups for IS plan.

Ying and Dong (2007) provided an approach to translate the business strategy in to projects via successful project portfolio management. It reviews the failure in strategy implementation and limitations in the previous solutions, and compares the main differences between project management and product management based organizations. The approach is verified using a case study in a Chinese organization. The approach consists of four phases namely Object, Portfolio, Decision and Action. The object phase consists of selecting a team that consists of key stakeholders from management and customer who have got the decision making power and can understand the opportunities and handle the risks. The selected team clarifies the goals/output/results expected from the projects that is in accordance with the vision of the organization. The critical activity during this phase is to select the criteria to evaluate the projects in the light of organization's business strategy. During the second phase, the projects are organized in to specific categories based on which the contribution to the business strategy couldbe measured. The third phase is how to assign the weightages to the criteria so that right evaluation is possible. The final phase is to optimize the performance.

Weil and Ross (2004) state that governance is about specifying the decision rights and accountability framework to encourage desirable behavior in the use of IT.

Vision for IT: This represents the defining of vision for IT by involving appropriate stakeholders in the organization, communicating the vision for IT to the entire organization and ensuring the uniform understanding of vision across organization.

Business Value Planning: This is to ensure that the critical business processes are identified in accordance with business strategy, creation of value indicators and SLAs while identifying the needed roles and accountabilities.

Design and Develop Suitable Architecture: An integrated set of technical choices to guide the organization in satisfying business needs and the technical architecture represents the intent of the business process architecture.

Business-IT alignment

The degree to which the information technology mission, objectives and plans support and are supported by the business mission, objectives and plans.

Design and implement Portfolio Management

IT Portfolio Management is the combination of tools and methods used to measure, control, and increase the return on both individual IT investments and on an aggregate enterprise level in a desirable manner that meets the organization's business objectives without exceeding available resources or violating other constraints.

Investment (Project) Management

To manage the project like an investment thus generating the ROI for the stakeholders and the organization through collection of metrics that are linked to business benefits.

Build Human Resources

This is to ensure that the right set of skills to aid the business-IT alignment are built

Build communication strategy

To ensure that right communication exists between the business and IT and ensure corporate communication is effective.

Enabling Technology

To ensure the appropriate automation, processes and tools.

Bartholet, Budd and Turisco (2009) described the factors for achieving business-IT alignment and opined that governance starts at the top. The major factors that impact business-IT alignment are business direction and IT initiative alignment, IT resource alignment, partnership and alignment between IT and the clinical communities, business communities and research,

accountability, transparent project request and prioritization processes, effective budget and project management, board-Level IT, executive committee and IT steering committee (ITSC).

Nielsen (2007) described about the IT Governance Program at Brigham Young University. The major challenge was "BYU OIT did not have a clear picture of the relationship between new projects, existing application and infrastructure assets. List of projects seemed to come from a number of sources and with no objective criteria to prioritize. Allocation of resources was a relatively ad hoc process. BYU's Office of Information Technology (OIT) was organized to support the university's major academic andbusiness processes. In 2001, in an effort to improve customer satisfaction and continue to better align IT investments with the values of the university and the church, the OIT setup the Enterprise ProjectManagement Office (EPjM). The OIT and EPjM share the common goal to be highly customer responsive and cost conscious, while ensuring that the reliability and security of all technology products. The development of a new IT governanceframework was critical in defining the role of EPjM and the OIT's overall success. Using the tool, Serena® Mariner®for Project and Portfolio Management (PPM), BYU was awarded the 2006 IQPC IT Financial ManagementExcellence Award for Best IT governance structure. The IT governance business process map described the entire process in to three phases namely Strategize, Implement and Operate. During the "strategize" phase four major element Customer, Strategy & Enterprise Architecture, Product Management and Project Portfolio Management were considered. During the implementation theproject management and development lifecycles were considered. The business process map described the interaction among all the four elements of strategize phase and interaction among elements of implement phase.

De Haes& Van Grembergen (2006) identifies the governance areas into three categories such as Structures, Processes and Relational Mechanisms. Using these three areas as major parameters, they assessed the IT governance maturity. The structures parameter consisted of IT Steering Committee(s), IT Strategy Committee, CIO on Executive Committee, CIO reporting to CEO ,Architecture Committee. The processes parameter consisted of SISP, Balanced Score Card, Portfolio Management, Charge Back arrangements, SLAs, COBIT. The relational mechanisms consisted of Job Rotation, Colocation, Cross training, Knowledge Management, Business/IT Account Managers, Senior Mgt giving good example, Internal Meetings between Business & IT Senior Management and IT leadership

Luftman and Brier (1999) conclude that executivesshould work toward minimizing those activities thatinhibit alignment and maximizing those activities thatbolster it, such as improving the relationships between thebusiness and IT functional areas, working toward mutualcooperation and participation in strategy development,maintaining executive support, and prioritizing projectsmore effectively.

(Chen, 2010) , conducted research and data was collected from 130 business and IT executives from 22 companies in China, 11 of which were multinationals operating in China, and explored several questions in the area of business–IT alignment. (1) Communications (COMM) - The effectiveness of leveraging information for mutual understanding and knowledge sharing. This category evaluates such issues as whether business and IT understand each other's operating environment, whether a liaison is used to facilitate knowledge transfer between them, and whether there are rigid protocols that impede discussion and sharing of ideas. Partnership (PART): Pertains to how IT and the business perceive each other's contribution. This evaluates issues such as IT's role in strategic business planning and how risk and rewards are shared by IT and business functions. Business' perception of the role of IT, Role of IT in strategic business planning, Integrated sharing of risks and rewards, Formality and effectiveness of partnership programs, Perception of trust and value, Reporting level of business sponsor/champion.

(Yang, et al., 2011) outlines in his research the enablers and inhibitors of the Business-IT alignment in medium organizations in the Korean context. Enablers are increasing commitment & involvement of top management and other groups within the corporation, firm alignment between the business and strategic information system planning in the context of Korean organizations. For example, the enablers are integrating objectives and strategies of the corporation, effective communication between the users and IS staff, considerations of internal and external business –IT environment in the corporation, etc. while the inhibitors are, poorly defined, aligned and integrated business objectives with IT, poor level of involvement and commitment of various levels of the corporation, inadequacy of analysis on anticipated changes in the environment external environment, **deficiency of understanding**, communication and knowledge sharing of SISP processes, lack of development of effective enterprise architecture.

Mapping of Practices with Literature

The research described above indicates the impact of BP on Business-IT alignment individually. So the literature has been surveyed to get the support from the literature for BP construct and the same is provided in the form of tables below.

Table 3-1 Mapping between DIM Practices and Literature

Practice no	Project Management	Cross references
1	Building required metrics (for eg based on balanced score card) based on the business objectives	Jeffery and Leliveld (2004)
2	Collecting metrics related to Cost, Quality and schedule including the performance indicators (for eg Billing accuracy in case of telecom billing products)	Jeffery and Leliveld (2004)
3	Building the required governance processes for Project/Program/Account Management and Software Development based on the models like CMMI/ITIL/ISO 9001/ISMS/proprietary model	Gregor and Hart (2007),Steve Dehaes&Van (2009),Sharma, Merlin and Ekinci (2009)
4	Building needed Operational level agreements (OLAs) with the appropriate stakeholders within the organization to meet the SLAs	De Haes&VanGrembergen (2006)
5	Periodic verification of process compliance through external and internal audits to see if the processes are implemented in the intended manner	Gregor and Hart (2007),Steve Dehaes&Van (2009),Sharma, Merlin and Ekinci (2009)
6	Metrics are consolidated at the Program level and are translated in to Program level metrics	Hauke,Hans, Mervyn and Maistry (2007),Jeffery and Leliveld (2004)
7	The program level metrics are mapped to the business benefits	Chad, Yu, Huang .and Wo-Chung (2005),Jeffery and Leliveld (2004)

Table 3-2 Mapping between DPM Practices and Literature

Practice no	Develop & Implement Portfolio Management Practices(DPM)	Cross referencing
8	Collecting the list of Projects related to each of IT Application Initiatives/software products	Ibrahemetal (2010).
9	Classification of all projects related to each of IT Initiatives/software products in to different Portfolios based on criteria (for eg. Transformational, operational and informational)	Weill, P. et al: Compilation of MIT CISR Research on IT Portfolio's, IT Savvy and Firm performance, (2000-2006)., MIT , Boston, 2006,Quraishi(2009),Ying and Dong (2007)
10	Prioritization of Projects and allocation of resources is based on the business priorities	Luftman and Brier (1999) ,Parker et al.(1998); De Haes& Van Grembergen, 2006, Weil and Ross (2004) ,Bartholet, Budd and Turisco (2009), Sargaent (2007),Ying and Dong (2007)
11	Building infrastructure needed for the portfolio management in terms for experienced human resources , tools and processes	Ibrahem et al (2010).
12	Assessing risk with respect to each portfolio on a regular basis and take appropriate course of actions	Mark (2005),Ying and Dong (2007),Segars and Grover (1998)

4. FRAMEWORK DEVELOPMENT, OBJECTIVES AND METHODOLOGY

4.1 RATIONALE FOR DEVELOPING THE RESEARCH FRAME WORK

The rationale for the framework is developed by identifying how Portfolio management impacts Project management and then the framework is designed.

Table 4-1 Rationale for Research Model Design

Paths in Research Design			Evidence from Literature survey
DIM	<---	DPM	Jeffery and Leliveld (2004)

4.2 RESEARCH FRAMEWORK

Based on the above rationale, the research framework is developed and Regression analysis is used to model this in quantitative terms.

Figure 4-1 Research Model

4.3 OBJECTIVE OF THE STUDY

- To understand the impact of Portfolio Management on Project management in the context of Indian IT Industry

4.4 HYPOTHESIS DESIGN

Hypothesis (H1) :Portfolio managementdoes not affect the Project Management.

RESEARCH DESIGN

The basic research design selected for this initiative is cross sectional survey conducted in the IT cover IT Industry in Chennai, Hyderabad, Pune and Noida who are in System Integration, through stratified random sampling from Middle and Senior Management executives with 5 plus years of experience. The questionnaire has been derived with factors ofPortfolio Management and Business-value planning using a 5 point scale (1 – Strongly disagree, 2 – Disagree, 3 – Neutral, 4 – Agree, 5 – Strongly agree). The tools used for Construct Validity are Content Validity, Reliability, Discriminant Validity and Confirmatory Factor Analysis. Correlation and Regression have been used to acquire appropriate inferences and testing of hypothesis.

Control variable

Control variable here is "type of organization". The examples for types of organizations could be that it is a System integration business or product development business or Captive IT.In this research, the target population is only System integration business and it is constant throughout the research.

4.5 CONTENT VALIDITY

A widely used method to measure content validity was developed by (Lawshe, 1975). It is a method for gauging the agreement among the experts regarding the essentiality of a particular item.

It is computed that Mean Content Validity Ratio (CVR) = 0.79 as compared to the target value of 0.50. For each practice the Content Validity ratio has exceeded the expected target value (which is based on the 15 subject matter experts) as per the above table. Since the Mean Content validity and the Content validity for each of the practice have exceeded their expected target values, we can conclude that the practices are in line with the expectations of the Subject Matter Experts and having high relevance in the Indian context to assess the relationship betweenDPM and Business-value planning.

4.6 PILOTING & CONSTRUCT VALIDITY

4.6.1 Reliability

The pilot survey was conducted with 49 respondents and checked for its reliability (for all the three factors together) with Cronbach alpha test(Cronbach & Meehl, 1955) and found to be 0.81**.**Since the pilot survey has shown a significant reliability value, the survey was continued to collect the data. Cronbach reliabilities for the pilot study also had been done for both thefactors (DPM and DIM) separately and the outcomesare 0.84and 0.85.

4.6.2 Convergent Validity

(Bagozzi and Phillips 1982) conducted research on convergent validity to understand "if measures of constructs that theoretically *should* be related to each other are, in fact, observed to be related to each other". Convergent validity is "the degree to which two or more attempts to measure the same concept…are in agreement".

Item convergence was assessed through the calculation of the average variance-extracted scores. Commonly, scores greater than 0.50 support a case for convergent validity (Fornell & Larcker, 1981).

According to results obtained, all of the "Average Variances Extracted" for constructs was greater than 0.50. Thus, convergent validity is evident.

According to all the average variances extracted estimates were close to or greater than 0.50 Thus, convergent validity is evident.

4.6.3 Discriminant Validity

Discriminant validity is "the degree to which measures of distinct concepts differs" (Bagozzi & Philips, 1982). Measures of different constructs should share little variance. Discriminant validity is important to the discussion of model fit because it establishes that two or more constructs are separate and distinct from one another. If constructs are separate and distinct from one another, then it can be established whether or not a predictive or causal relationship exists between them.

The results support the existence of Discriminant Validity, as the Average Variance Extracted (AVE) for each of the Constructs was greater than the shared variance between the constructs.

4.6.4 Confirmatory Factor Analysis

Upon satisfactory results, Confirmatory Factor Analysis (CFA) was performed to confirm the findings using SPSS Amos 20.0. The model values found satisfy the literature expectations.

Table 4-4 Summary of SEM model Values for constructs

Name of the construct	CMIN/DF	P	RMR	GFI	RFI	CFI	NFI	RMSEA
DPM	0.05	0.32	0.002	1	0.98	1	1	0
DIM	1.27	0.25	0.011	0.99	0.86	0.98	0.95	0.032

Interpretation of CFA

The structural equation modeling approach using Confirmatory Factor Analysis (CFA) compliments traditional methods of evaluating reliability (like Chronbach alpha) and validity. The measurement model examines the relationship of observed indicators to their underlying constructs (latent variables), and provides a confirmatory assessment of convergent validity by evaluating the significance of the estimated indicators coefficients. The loading obtained are strong.

The measures were validated through CFA using single factor model (Albright & Park, 2009). Here maximum likelihood method is used in AMOS 20.0 version.

5. DATA COLLECTION AND RESULTS

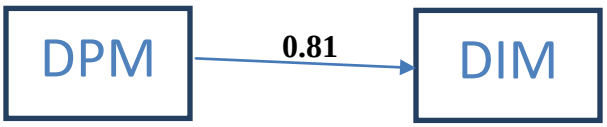
Questionnaires and interviews are a commonly used method of gathering data for research purposes. The major inputs considered for designing the questionnaire are the research objectives, hypothesis and the research framework and target population of research. The questionnaire is divided in to 2 sections with a totalof 13 questions. 269 valid filled questionnaires have been received.

5.1 RESULTS

5.1.1 Hypothesis Testing

Regression model was used to model the framework and test the hypothesis. In this case the regression coefficient and statistical significance are computed. The results are shown in the following path diagram and table.

Model diagram:



6. DISCUSSION AND CONCLUSION

6.1 EFFECT OF BUSINESS VALUE PLANNING(BVP) ON PORTFOLIO MANAGEMENT(DPM)

It is observed that Portfolio Management (DPM) affects Project management (DIM). The effect of DPM on DIM is 0.81 and is statistically significant at 1% level. The regression coefficient 0.81 means that when DPM goes up by 1 standard deviation, “DIM” goes up by 0.81 standard deviations. So the effect of DPM on DIMis strong and significant statistically. *So the null hypothesis (H1) is rejected and alternate hypothesis is accepted.*

6.2 CONCLUSION

The effect of Portfolio management(DPM) on project management (DIM) indicatesthat theportfolio managementis critical in providing the inputs to project management area is useful during the tracking the success of the IT initiatives throughout the implementation.

6.3 RESEARCH IMPLICATIONS

6.3.1 Implications for Theory base

The implications of this research towards the theory are to build a structure for the Project Management(DIM) and portfolio management(DPM).The construct structures are designed using the literature survey and tested through confirmatory factor analysis - single factor model using Maximum Likely hood method (ML) through Structured Equation Modeling (SEM). The confirmatory factor analysis showed very good relationships between the constructs and the items under each of the constructs. The model fit values match or exceed the expectations from the literature. The framework developed would add value to the theory base as it describes interaction between the business value planning (BVP) and DPM.

6.3.2 Implications for IT organizations

The study describes a very good correlation between portfolio management (DPM) and Project Management (DIM). The portfolio management (DPM) is critical to assess the required portfolios that support the business strategy through project management.

6.3 LIMITATION

- The size of the organization could play a role and thus focusing on Small/Medium/Large organizations may result in a different model/Interrelationships.
- In the current study, the maturity of the organization is not considered in the scope and the maturity of the organization could alter the findings.

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