IMPACT OF PORTFOLIO MANAGEMENT ON BUSINESS-IT ALIGNMENT

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Abstract

The purpose of this research is to understand and quantify the impact of portfolio management on Business-IT Alignment and strength of interaction among them. A theoretical framework is proposed regarding the constructs of, Portfolio management (DPM) and Business-IT Alignment (BIA) 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 is high on Business-IT alignment.

Key words: Business-IT alignment, Portfolio management.

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1.   INTRODUCTION

Business IT alignment is defined as the extent to which the IT strategy supports, and is supported by, the Business Strategy. (Venkatraman, et al., 1993), stated that during the last two decades, Information Technology (IT) has become very critical in providing support, sustaining the competitive position and enabling the growth of business. However the alignment of IT with business strategy has been consistently ranked as the single most important issue facing business and IT executives, not only in North America but also in Europe.

(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.
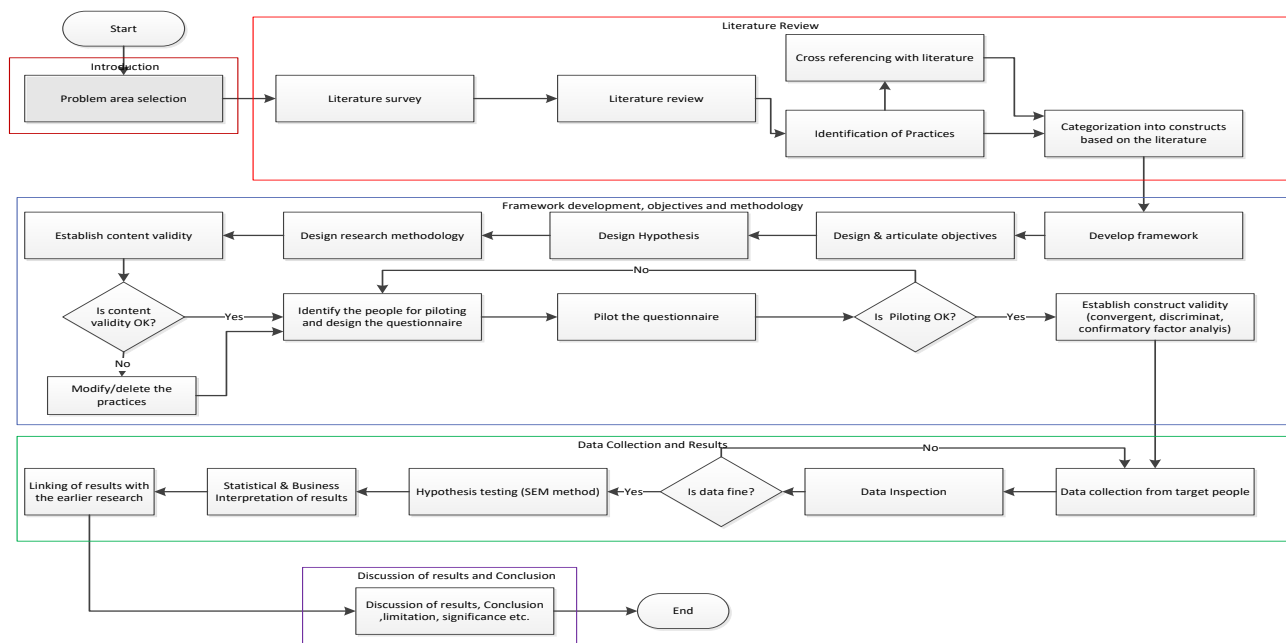
3.   LITERATURE REVIEW

(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.

(Reich & Benbasat, 2000) in a study described four factors that impact the business-IT alignment after conducting a total of 57 semi structured interviews with 45 informants. They critically looked at written business & IT strategic plans, meeting minutes of IT steering committee meetings and other strategic documents were collected from each of the 10 business units. They observed that shared domain knowledge between IT and business executives, IT implementation success, communication between business executives & IT executives and connections between business and IT planning processes were found to have the influence on the short term alignment. Only shared domain knowledge and strategic business plans were found to influence in the long term as well as short term.

(Weill & Aral, 2006)Conducted their research and discussion with CIOs and IT managers at 147 U.S. companies in large U.S & European and Asian organizations to understand the IT savvy. They found that many companies are still not able to utilize the total potential of their IT investments, although they implement IT portfolio management as a best practice, The studies show that a measurable premium benefit can be gained by implementing a set of interlocking

business practices and processes, known as IT savvy. There are three practices related to IT use and two competencies needed for establishing IT savvy. The three practices for IT are internal & external communication, Internet use, Digital transactions and the competencies needed are companywide IT skills & management involvement. These practices and competencies would facilitate the company to achieve business – IT alignment.

(Heather, et al., 2007) conducted research to understand the issue of how to develop an effective strategy using focus group methodology. The research identified the critical success factors for creating the business value through building the IT strategy and challenges involved. The critical success factors included revisiting the business model on a periodic basis, developing strategic themes to develop business capabilities and building partnerships with business. The major challenges are lack of supportive governance structure, lack of enterprise-wide funding models, lack of appropriate traditional planning and budgetary practices, lack of better skills of business and IT leaders for strategizing and finally inability of IT strategy to create balance among conflicting strategic imperatives.

(Preston & Karahana, 2009), in their research describe a nomological network in which shared understanding between the CIO and Top Management team (TMT) about the role of IS in the organization (which represents the social dimension of IS strategic alignment) as an antecedent of the intellectual dimension of IS strategic alignment. It is further described that shared language and shared domain knowledge brings in improvement in the CIO's business knowledge. The critical determinants of shared understanding are top management's (TMT) strategic IS knowledge, systems of knowing (structural and social), and CIO-TMT experiential similarity. Data were collected from 243 matched CIO-TMT pairs. Results largely support the described nomological network. Specifically, shared understanding between the CIO and TMT is a significant antecedent of IS strategic alignment. Furthermore, shared language, shared domain knowledge, and structural systems of knowing, influence the development of shared understanding between systems of knowing, representing informal social interactions between the CIO and TMT, and experiential similarity did not have a significant effect on shared understanding.

(Yalya & Hu, 2009), in their study, five antecedents of alignment namely centralization, formalization, shared domain knowledge, successful IT history and relationship management are identified. They further hypothesized that the effects of these antecedents are mediated by two drivers of alignment. They are, the level of connection of IT and business planning and the level of communication between IT and business managers. Using survey data and structural equation modeling methodology, they showed that both drivers had significant effects on alignment. Overall, the main contribution of this study is the development and empirical validation of a comprehensive strategic alignment model, providing a more ample prescriptive insight for managing IT-business strategic alignment.

(Smith & Mckeen, 2010) describe the issues with respect to the communication between the business and IT. One of the most important skills all IT staff need to develop today is how to communicate effectively with business. Over and over, research has shown that if IT and business cannot speak the same language, focus on the same issues and communicate constructively, they cannot build a trusting relationship. And business is consistently more negative about IT's ability to communicate effectively than IT is. In fact, even while IT collaboration is improving, business's assessment of IT's communication skills is declining. While much attention has been paid to organizational alignment between IT and business (e.g., governance, structure) very little has been paid to the nature and impact of the social dimension of alignment, a big element of which involves communication. To explore the business and interpersonal competencies that IT staff will need in order to do their jobs effectively over the next five–seven years and what companies should be doing to help develop them, the authors convened a focus group of senior IT managers from a variety of different organizations.

(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.

(Tunuguntla etal,2013) conducted a study in the context of Indian IT industry to understand and quantify the direct and indirect effects of partnership and building human resources on business-IT alignment. The research identified about seven to eight empirical studies that described the interaction between the factors considered in this study and business-IT alignment. A theoreticalframework was proposed regarding the constructs of partnership, human resources and business-IT alignment (BIA). Thesample data from sixty-five firms were obtained through structured questionnaires. Structural equation modeling (SEM)was used to understand the strength of relationships among the three constructs and estimate the probability associatedwith the indirect effects using bootstrap technique. The results showed that building human resources and developingpartnership between business and IT groups have a significant direct and indirect effect on business-IT alignment. Theresults suggest that building human resources and partnership is essential and play a key role to establish business-ITalignment contributing to business strategy.

(Manfreda & Mojca, 2014) proposed this paper is thus to improve the understanding of the relationship between top management and IS personnel and to identify the key factors that are important in this relationship. Two separate questionnaires were used for IS department managers and top management to identify key factors in the relationship. In total, 221 CIOs and 93 CEOs agreed to participate in the research. The empirical investigation reveals the existence of nine factors that are important in the business-IS relationship. Seven factors (top management support to the IS department (topSUP), mutual trust between management and IS personnel (muTRUST), perceived value of the IS department (Isval), managerial knowledge and skills of the IS manager (manKNL), technological knowledge and skills of the IS manager (techKNL), business knowledge and skills of the IS manager (busKNL), business role of the IS department (busROL), supporting role of the IS department (supROL), and technological role of the IS department (techROL)). are perceived differently by top management and IS management and thus causing the gap in the relationship, while two factors are similarly perceived. This paper presents the key areas business and IS personnel should pay attention to. Therefore, it enables reducing the business-IS gap by considering the identified factors and dedicating significant effort to the factors with significant differences.

(Zolper, K et al, 2014) studied the impact of relationships at the application-change level and strives to identify and explain favorable social structures for effective business/IT dialog at the operational level. They collected data in seven comprehensive case studies, including 88 interviews and corresponding surveys, and applied social network analysis to show that three social structures at the implementation level influence the degree to which IT applications are maintained and enhanced in line with business requirements: 1 interface actors connecting business and IT, (2) the relationships between interface actors and the corresponding unit, and (3) the relationships between interface actors and other employees in their unit. In three cases, less favorable structures are revealed that correspond to low application change effectiveness and software applications that do not meet business requirements. The other cases benefit from favorable social structures and thus enhance fulfillment of business requirements and result in higher IT business value. This paper contributes to IS research by helping to explain why companies may not provide favorable IT services despite favorable relationships at the top management level and successful application development projects.

(Maharaj & Brown, 2015) examined the impact of shared domain knowledge (SDK), strategic information systems planning on alignment. Data were gathered from management consultants in a large, global IT organization, through the use of a structured questionnaire, and analyzed. Shared Domain knowledge (SDK) was also found to positively impact both the intellectual and social dimensions of alignment. The implications of the findings are that fostering a knowledge sharing environment in organizations will help improve alignment, as well as the formal processes designed to steer alignment such as on strategic information systems planning (SISP).

(Roses, L.K et al, ,2015) proposed a model of conversational competences for Business and IT managers aiming at the strategic alignment between their areas. The theory of this alignment highlights the importance of communication between Business and IT areas, which is explored in the social dimension of their managers' relationship through conversational competences. A survey research was performed with Business and IT managers from public and private organizations in Brazil, whose data were analyzed through multivariate statistical techniques - exploratory and confirmatory factor analysis - and thematic content analysis. The results confirmed the constructs and most of the hypotheses of the proposed research model, which was expanded with new constructs and hypotheses

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 DPM Practices and Literature

Practice no	Develop & Implement Portfolio Management Practices(DPM)	Cross referencing
1	Collecting the list of Projects related to each of IT Application Initiatives/software products	Ibrahemetal (2010).
2	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)

3		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)
	Prioritization of Projects and allocation of resources is based on the business priorities	
4	Building infrastructure needed for the portfolio management in terms for experienced human resources , tools and processes	Ibrahem et al (2010).
5	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)

Table 3-2 Mapping between BIA Practices and Literature

Practice number	Business – IT Alignment(BIA)	Cross referencing
6	Assessment of the alignment between Business and IT	(Luftman & Brier, 1999),(Callahan & Keyes, 2003)
7	Understanding of Business case (including the value indicators) prepared for the IT Initiatives	(Buckhow & Rey, 2010)(Callahan & Keyes, 2003)
8	Building approach for computing the value indicators (the metrics that quantify the business expectations. For e.g ."billing accuracy" in case of telecom billing products)	(De Haes & Van Grembergen, 2006);(Van Der Zee & De Jong, 1999)(Farrell, 2003)(Callahan & Keyes, 2003)
9	Tracking success of the IT initiatives	(Luftman & Brier, 1999)
10	Updating business case and compares actual benefits with the planned benefits	((Chad, et al., 2005)
11	Assessment of value add to the Business from each portfolio based on the value indicators (for eg dollars saved due to "billing accuracy" incase of Telecom billing products) identified during Business value Planning state.	(Luftman & Brier, 1999)

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 BP impacts Business-IT alignment and then the framework is designed.

Table 4-1 Rationale for Research Model Design

Paths in Research Design			Evidence from Literature survey
BIA	<---	DPM	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)

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.
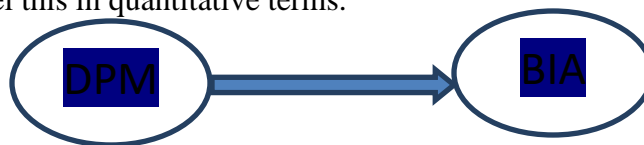

Figure 4-1 Research Model

4.3 OBJECTIVE OF THE STUDY

• To understand the impact of Portfolio Management on Business-IT alignment in the context of Indian IT Industry

4.4 HYPOTHESIS DESIGN

Hypothesis (H1) : Portfolio Management does not affect the Business-IT alignment.

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-IT alignment 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-IT alignment.

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 the factors (DIM and BIA) 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
Business-IT Alignment(BIA)	1.15	0.32	0.01	0.98	0.97	0.99	0.98	0.024

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 10 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 PORTFOLIO MANAGEMENT (DPM) ON BUSINESS-IT ALIGNMENT (BIA)

It is observed that Portfolio management (DPM) affects the Business – IT Alignment (BIA) The direct effect of DPM on BIA is 0.77 and is statistically significant at 1% level. The regression coefficient 0.74 means that when DPM goes up by 1 standard deviation, "BIA" goes up by 0.77 standard deviations. So the effect of DPMis 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 Business-IT alignment indicates that theportfolio managementis critical 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 portfolio managementimpacting the Business-IT Alignment.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 DPMand Business-IT alignment.

6.3.2   Implications for IT organizations

The study describes a very good correlation between portfolio management (DPM) and Business-IT alignment. The portfolio management (DPM) is critical to assess the required portfolios that support the business strategy

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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