ISSN 2319-345X
Vol. 6, No. 2, April 2017

IJMRBS

International Journal of Management Research and Business Strategy

www.ijmrbs.com

MEGHANA PUBLICATIONS
www.meghanapublications.com

International Journal of Management Research and Business Strategy

ISSN 2319-345X www.ijmrbs.com
Vol. 6, No. 2, April 2017

RELATIONSHIP BETWEEN IT ARCHITECTURE AND BUSINESS-IT ALIGNMENT

Lakshmi Vishnu Murthy Tunuguntla[1]*

Corresponding Author:* ***Lakshmi Vishnu Murthy Tunuguntla,* ✉ *Process.Innovation@gmail.com*

The purpose of this research is to understand and quantify relationship of Develop scope and implement architecture on Business-IT Alignment and strength of interaction among them. A theoretical framework is proposed regarding the constructs of, Develop scope and implement architecture 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 Develop scope and implement architecture is strong on Business-IT alignment.

Keywords: Business-IT alignment, Develop scope and implement architecture

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) is playing a critical role and has become a key component in providing support, deriving and sustaining the competitive position and business growth enabler. However the business strategy alignment with IT has been consistently ranked as the single most important issue facing business and IT executives, across the globe.

Kaur and Sengupta (2011) conducted a study to understand the probable reasons for software failures. Their findings reveal that most of the projects are not successful due to poorly defined applications, miscommunication between business and IT, inappropriate requirements gathering, analysis, lack of relationship and trust between business and IT, and management costing US businesses about $30 bn every year.

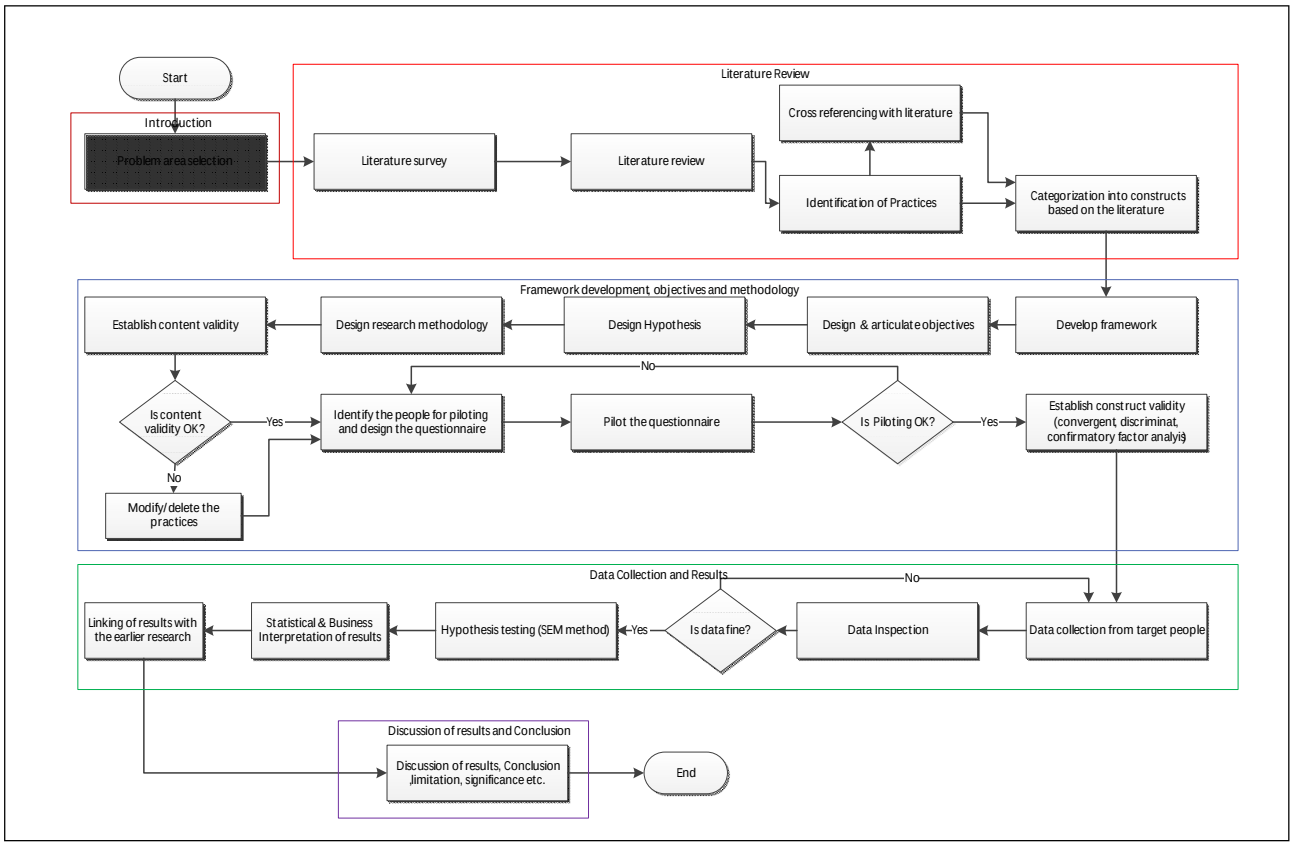
METHOD

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

LITERATURE REVIEW

Weil and Ross (2004) define the IT governance as “IT governance is about specifying the

[1] Associate Professor, Goa Institute of Management, Sanquelim Campus, Poriem, Sattari, Goa - 403505, India.



decision rights and accountability framework to encourage desirable behavior in the use of IT". They recommended five key IT governance decisions as described below after studying the best practices of 300 enterprises in 23 different countries. They are described as below.

IT Principles: High level decisions about the strategic role of IT in the business

IT Architecture: An integrated set of technical choices to guide the organization in satisfying business needs

IT Infrastructure: Centrally coordinated shared IT services providing the foundation for the enterprise's IT capability and typically created for before precise usage needs are known

Business Application Needs: Business requirements for purchased or internally developed IT applications.

Prioritization and Investment: Decisions about how much and where to invest in IT, including project approval and justification techniques.

Whittle and Myrick (2004) describe the enterprise business architecture as a major linkage between business strategy and results. They opine that "The enterprise is not about chaos and "the worst of times"; it's about connectivity, causality, and understanding those relationships to both internal and external factors that lead to "the best of times." This connectivity, causality, and understanding are elements in an architecture of the business which is a unifying structure. This structure enables the execution of the strategy through its initiatives to achieve business results. In the absence of this awareness or knowledge, it is fair to perceive the enterprise as chaotic and unpredictable. Some times the business is

impacted by the external and internal factors and seems "out of control", experiencing daily chaos of quick fixes to problems leading to degradation of process efficiency, affect product quality, render poor customer service, and ultimately results in impacting the bottomline. In order to control the situation, control the enterprise as a natural extension of vision and strategy with the Enterprise Business Architecture. Failure to address this would result in unpredictable chaotic events. The formality of the Enterprise Business Architecture may frighten some business people and others may feel it is unnecessary and not an important item as it seems "too disciplined, too engineering like and too technical". Many others still prefer the use of loosely defined diagrams and business models presented in colorful and creative presentations. However, these mostly do not serve the purpose during the life cycle of a strategic initiative as they provide little "substance beyond the show." The Enterprise Business Architecture, in contrast, formally links the corporate strategy to tangible and demonstrable results, and to "the best of times"."

Sauer and Wilcocks (2002) argue in their research that the job of aligning the business needs and technology support to IT or operations is not given priority. In the modern times of e-business there is a need to integrate business needs and technology with IT and operations. This is possible by creating a role called "organizational architect". Organizational architects work with both strategists and technologists to identify andgrow the organizational and technical capabilities needed to support the vision through to its supporting platform. The organizational architect follows a business vision through three translations. (1) First identify the required organizational capabilities and then define the platform that enables them. At each point, the architect explores trade-offs between what is desirable and what is achievable in the light of vision and its supporting technology, thus moving it from abstract(top of the vertical arrow) to concrete (bottom) at each translation point. Thus, the vision shapes the platform and the platform's capabilities keep the vision realistic. The research also describes a model to translate the vision of the organization in to actual platform as described below.

Good alignment means that the organization is applying appropriate IT in given situations in a timely way, and that these actions stay congruent with the business strategy, goals, and needs (Luftman and Brier, 1999).

De Haes and 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 and IT Senior Management and IT leadership.

De Haes and 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 and IT Senior Management and IT leadership.

Van Der Zee and de Jong (1999) and CIO Insight Staff (2004) raised the issue of the lack of a common 'language' between business and IT executives. The common language would help to understand better and build the relationship which in turn assists with alignment in thought and action**.**

Mapping of Practices with Literature

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

Table 1: Mapping Between DSA Practices and Literature

Practice Number	Develop scope and Implement Architecture (DSA)	Cross References
1	Map Business Process Architecture and Technical Architecture	Weil and Ross (2004), Buckow and Rey (2010), Whittle and Myrick (2004), Ross (2004), Sauer and Wilcocks (2002), Segars and Grover (1998)
2	The Scope of IT architecture encompasses the entire organization wherever the Business strategy is applicable	Weil and Ross (2004), Whittle and Myrick (2004), Ross (2004), Sauer and Wilcocks (2002), Segars and Grover (1998)

Table 2: Mapping between BIA Practices and Literature

Practice Number	IT Alignment(BIA)	Cross Referencing
3	Assessment of the alignment between Business and IT	(Luftman and Brier, 1999), (Callahan and Keyes, 2003)
4	Understanding of Business case (including the value indicators) prepared for the IT Initiatives	(Buckhow and Rey, 2010) (Callahan and Keyes, 2003)
5	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 and Van Grembergen, 2006); (Van Der Zee and De Jong, 1999); (Farrell, 2003) (Callahan and Keyes, 2003)
6	Tracking success of the IT initiatives	(Luftman and Brier, 1999)
7	Updating business case and compares actual benefits with the planned benefits ((Chad, et al., 2005)	
8	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 and Brier, 1999)

Table 4: Rationale for Research Model Design			
Paths in Research Design			Evidence from Literature Survey
BIA	<—	DSA	Weil and Ross(2004)

Framework Development, Objectives and Methodology

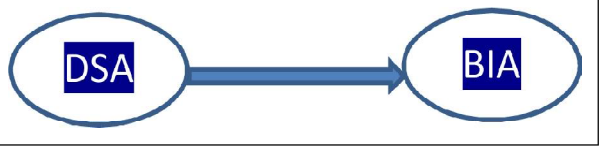
Rationale for Developing the Research Frame work

The rationale for the framework is developed by identifying how DSA impacts Business-IT alignment and then the framework is designed.

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: Research Model



OBJECTIVE OF THE STUDY

- To understand the impact of Develop scope and implement architecture on Business-IT alignment in the context of Indian IT Industry

Hypothesis Design

Hypothesis (H_1): *Develop scope and implement architecture 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 of Develop scope and implement architecture 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.

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) greater than 0.5. For each practice the Content Validity ratio has exceeded the expected target value (which is based on the 15 subject matter experts).Since 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 between DSA and Business-IT alignment.

Piloting and Construct Validity

Reliability

The pilot survey was conducted with 49 respondents and checked for its reliability with Cronbach alpha test (Cronbach and Meehl, 1955) and found to be 0.73**.** 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 (DSA and BIA) separately and the outcomes are 0.73 to 0.80.

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 and 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.

Discriminant Validity

Discriminant validity is "the degree to which measures of distinct concepts differs" (Bagozzi and 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.

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.

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

Table 4: Summary of SEM Model Values for Constructs

Name of the construct	CMIN/DF	P	RMR	GFI	RFI	CFI	NFI	RMSEA
DSA	0.8	0.44	0.009	0.99	0.98	1	0.99	0
Business-IT Alignment(BIA)	1.15	0.32	0.01	0.98	0.97	0.99	0.98	0.024

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 and Park, 2009). Here maximum likelihood method is used in AMOS 20.0 version. For all the items under each of the construct, the regression loadings are shown in the table listed above.

DATA COLLECTION AND RESULTS

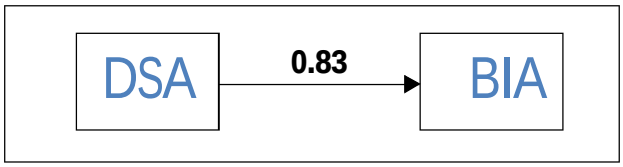
Questionnaires and interviews are a commonly used method of gathering data for research purposes. The major inputs considered for designing the questionnaire are the research objectives, hypothesis and the research framework and target population of research. The questionnaire is divided in to 2 sections with a total of 8 questions. 269 valid filled questionnaires have been received.

Results

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



DISCUSSION AND CONCLUSION

Effect of Develop scope and implement architecture (DSA) on Business-IT Alignment (BIA)

It is observed that *Develop scope and implement architecture* (DSA) affects the Business – IT Alignment (BIA) The direct effect of DSA on BIA is 0.83 and is statistically significant at 1% level. The regression coefficient 0.83 means that when DSA goes up by 1 standard deviation, "BIA" goes up by 0.83 standard deviations. So the effect of DSA is strong and significant statistically. *So the null hypothesis (H_1) is rejected and alternate hypothesis is accepted.* This relationship signifies that higher levels of Develop scope and implement architecture lead to higher levels of Business-IT alignment. Conclusion

The effect of Develop scope and implement architecture (DSA) on Business-IT alignment indicates that the *Develop scope and implement architecture* is critical to have effective business value planning

Research Implications

Implications for Theory base

The implications of this research towards the theory are to build a structure for the construct Develop scope and implement architecture impacting 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 DSA and Business-IT alignment.

Implications for IT Organizations

The study describes a very good correlation between *Develop scope and implement architecture* (DSA) and Business-IT alignment. The DSA improves the business-IT alignment.

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.

REFERENCES

1. Albright J J and Park M (2009), "Confirmatory Factor Analysis Using Amos, LISREL, Mplus, and SAS/STAT CALIS", [Online] available at http://www.indiana.edu/ ~statmath/stat/all/cfa/index.html. Accessed on 15 12 2011].
2. Bagozz R P and Philips L W (1982), "Representing and Testing Organizational Theories: A Holistic Construal", *Administrative Science Quarterly*, vol. 27, No. 3, pp. 459-489.
3. Buckhow H and Rey S (2010), "Why Business Needs Should Shape Architecture", *Mckinsey on Business Technology*, Vol. 19, No. 5.
4. Callahan J and Keyes D (2003), *The Evolution of IT Governance at NB Power,* Idea Group Publishing, Hershey(PA).
5. Chad L, Yu A, Huang C and Wo-Chung L (2005), "Effects of Information Technology Maturity on the Adoption of Investment Evaluation Methodologies: A Survey of Large Australian Organizations", *International Journal of Management*, Vol. 24, No. 4.
6. Cronbach L and Meehl P (1955), "Construct Validity in Psychological Tests", *Psychological Bulletin*, Vol. 52, No. 4, pp. 281-302.
7. De Haes S and Van Grembergen W (2006), *IT Governance Best Practices in Belgian Organisations*, pp. 4-7, Hawaii, s.n.
8. Farrell I (2003), *Aligning IT to Corporate Objectives:Organisational Factors in Use,* s.n., Sydney.
9. Feeny D F and Willcocks L P (1998), "Core IS Capabilities for Exploiting Information Technology", *MIT Sloan Management Review*, Vol. 39, No. 3, p. 9.
10. Kaur R and Sengupta J (2011), "Software Process Models and Analysis on Failure of Software Development Projects", *International Journal of Scientific & Engineering Research*, Vol. 2, No. 2, pp. 1-4.
11. Lawshe C H (1975), "A Quantitative Approach to Content Validity", *Personnel Psychology*, Vol. 28, pp. 563-575.
12. Luftman J and Brier T (1999), "Achieving and Sustaining Business-IT Alignment", *California Management Review*, Vol. 42, No. 1, pp. 109-122.
13. Ross J (2003), "Creating a Strategic IT Architecture Competency: Learning in

Stages", *MIT Sloan Management Review*, Vol. 19 (CISR WP No.335).

14. Sauer C and Willcocks L P (2002), "The Evolution of the Organizational Architect", *MIT Sloan Management Review,* Vol. 43, No.3, p. 45.

15. Venkatraman N, Henderson J C and Oldach S (1993), "Continuous Strategic Alignment: Exploiting Information Technology Capabilities for Competitive Success", *European Management Journal*, Vol. 139, No. 149, pp. 139-149.

16. Weill P and Ross J (2004), *IT Governance: How Top Performers Manage IT Decision Rights for Superior Results,* Harvard Business School Press, Boston.

International Journal of Management Research and Business Strategy
Hyderabad, INDIA. Ph: +91-09441351700, 09059645577
E-mail: editorijmrbs@gmail.com or editor@ijmrbs.com
Website: www.ijmrbs.com