CHAPTER 5

DISCUSSION AND CONCLUSION

5.1 INTRODUCTION

This chapter is planned to provide the discussion of the results in the light of objectives of the study and how the objectives are achieved. Also an attempt would be made to provide traceability among various components in this study like objectives, hypothesis, results. Also it would describe the concluding remarks, limitations and contribution made to the industry, literature and the society in a modest manner.

5.2 HIGH LEVEL VIEW OF THESIS

This research draws on the results from various theories, models and approaches in order to build a framework showing the interaction of various IT governance practices impacting the business-IT alignment. A fundamental premise of this research is that there is an interaction between constructs like Building the Partnership, Building the Human Resource skills, Building the Communication Strategy and Enabling Technology which are mostly enablers and other factors like Vision for IT, Business Value Planning, Develop & Implement Portfolio Management, Develop Scope and Implement Architecture, Develop and Implement Portfolio Management, Develop and Implement Project (investment) Management while impacting Business-IT alignment resulting in a complex framework.
Some constructs have only direct effect on Business-IT Alignment and some have both direct & indirect effects on Business-IT Alignment.

In short this research helps us to amalgamate the knowledge of social factors and intellectual factors, understand the relationships among them and impact of these factors on Business-IT Alignment. So in one set of interaction, a variable may be dependent and it becomes an independent variable in the next set of interactions and all these interactions are happening simultaneously in the framework. Hence Structural Equation Modeling (SEM) has been selected as the most appropriate technique to model these interactions and identify the direct and indirect effects of each IT governance factor on Business-IT Alignment.

The following table illustrates the relationship across the title of the thesis, objectives of the research, hypothesis designed, hypothesis testing, discussion of results and conclusion.

**Table 5-1 Traceability matrix**

<table>
<thead>
<tr>
<th>Title</th>
<th>Objectives</th>
<th>Hypothesis</th>
<th>Hypothesis testing and results</th>
<th>Discussion and review</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMPACT OF IT GOVERNANCE FACTORS ON BUSINESS – IT ALIGNMENT</td>
<td>To Identify and understand the impact of IT governance factors (ET, BP, BCS, BHR, DSA, VIT, BVP, DPM, DIM) on business-IT alignment.</td>
<td>H1 - There exists no relation among IT governance factors ET, BP, BCS, BHR, DSA, VIT, BVP, DPM, DIM and Business – IT Alignment (BIA)</td>
<td>Hypothesis testing of H1 - Section 4.13</td>
<td>Result discussion in the context of Business - Section 5.1 Conclusion - 5.4.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H2 - There exists no relation between ET, BCS, BP, BHR and DSA.</td>
<td>Hypothesis testing of H2 - Multiple regression equation - Section 4.7</td>
<td>Section 5.3.1 &amp; 5.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H3 - There exists no relation between DSA, ET, BCS and VIT</td>
<td>Hypothesis testing of H3 - Multiple regression equation - Section 4.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>H4 - There exists no relation between ET, BHR, BP, BCS, VIT and BVP</td>
<td>Hypothesis testing of H4 - Multiple regression equation - Section 4.9</td>
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<tr>
<td></td>
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<td>H5 - There exists no relation between ET, BHR, BP, BCS, BVP, DSA and DPM.</td>
<td>Hypothesis testing of H5 - Multiple regression equation - Section 4.10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>H6 - There exists no relation between ET, BHR, BCS, DPM, DSA</td>
<td>Hypothesis testing of H6 - Multiple regression equation -</td>
<td></td>
</tr>
</tbody>
</table>
and DIM and DIM

Section 4.11

H7 - There exists no relation between ET, DSA, BVP, DIM and Business – IT Alignment (BIA)

Hypothesis testing of H7 - Multiple regression equation - Section 4.12

• To design and validate a framework depicting the relationships among IT governance factors (ET, BP, BCS, BHR, DSA, VIT, BVP, DPM, DIM) and business-IT alignment.

(H9) There exists no close model fit (Population RMSEA < 0.05) among IT governance factors (ET, BP, BCS, BHR, DSA, VIT, BVP, DPM, DIM)) impacting business – IT alignment (BIA)

Hypothesis testing of H9 - Structural equation modeling- Section 4.14 & Section 4.15.2

Section 5.3.2 & 5.5

• To understand the views of Middle & Senior Management on the IT governance factors impacting Business-IT Alignment.

H8 - There exists no difference in the views of senior and middle management on the IT governance factors impacting business – IT alignment

Hypothesis testing of H8 - t - Test - Section 4.13

Section 5.3.3 & 5.5


5.3 EVALUATING THE ACHIEVEMENT OF OBJECTIVES

In order to evaluate the objectives, the data has been collected from the target population and some of the details of data collected from target population are described. The data collection was found to have a response rate of 32.7% from system integration, 38.3% from captive IT organizations and 29% from product development organizations. The distribution of Senior and middle management were about 41.1% and 59.4% respectively. The distribution of number of respondents of Top and Middle Management is more or less uniform indicating a balanced sample.

The following section subsections of 5.3 discuss the major findings with respect to the objectives of the study.
5.3.1 Evaluation of first objective

The purpose of first objective is to understand the impact of governance factors on Business-IT Alignment. The primary tasks in achieving this objective were the literature survey, identification of the practices under each construct and to organize in the form of a framework. The construct validity is established using content validity ratio, reliability (chronbach alpha), Convergent Validity, Discriminant Validity and Confirmatory Factor Analysis. Subsequently the Correlation and Multiple Regression Equations were computed to understand the quantitative relationships among each set of constructs. The relationships were explained in business terms for each of the interactions in the previous chapter. The Variance Inflation Factor (VIF) was computed to understand if there is any inflation of the regression coefficients. The VIF factors were found to be within the acceptable limits as per the literature. The multiple regression results obtained were compared with the studies in literature and exceptions from literature are explained. In order to understand the impact of each construct on the Business-IT Alignment, the direct, indirect effects and total effect of each construct on Business-IT Alignment are computed using the Maximum Likelihood (ML) Method of Estimation and Bootstrapping estimation during Structural Equation Modeling (SEM). The results showed that the significant effect is from the constructs like Business Value Planning (BVP), Design and Develop Suitable Architecture (DSA), Build Communication Strategy (BCS), Enabling Technology (ET), Build Partnership (BP), and Design and Develop Investment (Project) Management (DIM). Business Value Planning became very significant factor as the crucial aspects like understanding of business strategy getting translated in to the identification of business processes critical for the success of the organization. The identification of the value indicators is another vital part that allows understanding of the business drivers and pain points in quantitative terms with respect to the critical business processes. The agreement on the critical business processes, the value indicators among the key stakeholders and articulation of the same through service level agreements brings the action to align the IT initiatives to the Business Processes. Another salient point is identification of the roles and responsibilities of the people across Business & IT and making them responsible/accountable for the success of the initiatives.
The second important factor is Design and Develop Suitable Architecture (DSA). This is playing a key role in ensuring that Business Process Architecture is mapped to the Technical Architecture within the organization where the Business Strategy is being implemented. The mapping and relationship between the business process architecture will enable the technology to address the pain points and the business drivers of the organization and leads to Business-IT alignment. In this research, it is observed that the DSA is also indirectly impacting the business-IT Alignment through the other constructs like VIT, DPM and providing the inputs to the other constructs. DSA provides inputs about the current state of Enterprise Architecture and the standards that are required to comply with it to DIM. This ensures that the IT initiatives that are being implemented will map to the Enterprise level Architecture and there is no dissonance between the Business Process Architecture and Enterprise Architecture leading to Business-IT Alignment. DSA also provides inputs to DPM about the fitment of new IT initiatives in to the Enterprise Architecture and influences the prioritization process. As a result, the mapping between the Business Process Architecture and Enterprise Architecture remain intact contributing to Business-IT Alignment. DSA provides inputs to VIT about the enterprise architecture from time to time. This becomes an input to the Executive Management during the process of articulation/rearticulating of Vision for IT from time to time about the role of IT.

The third significant factor is Build Communication Strategy (BCS). This pertains to the development of a strategy to enable the appropriate and timely communication among the stakeholders about various issues. BCS performs this enablement through other constructs such as VIT, BVP and DPM. The communication during Business Value planning is very important as it involves multiple stakeholders from different domains. The exchange of views and gaining consensus on various issues would lead to identification of right initiatives and results in improving the contribution to Business–IT Alignment. During the Portfolio Management Process, BCS plays a similar enabler role in the identification of right criteria for selecting the various categories of portfolios, assigning weightages and ensuring that each portfolio is contributing to the Business Strategy leading to Business-IT Alignment. Another important dimension BCS enables is, the
communication across the organization about the success of the IT initiatives thus bringing in the awareness about the value addition brought in by IT to improve Business-IT Alignment.

The fourth significant factor impacting the Business-IT Alignment (BIA) is Enabling Technology (ET). It has both direct and indirect effects on BIA. Enabling Technology facilitates the harmony of mapping between Business Processes Architecture and Technical Architecture by implementing the needed processes, procedures and automation leading to Business-IT Alignment. It provides inputs to Vision for IT from time to time on the state of implementation of the processes, procedures and extent of automation across the organization. This helps VIT to fine tune the vision statement and communicate across the organization. ET defines the necessary processes and automation for needed for DPM to implement setting up of criteria and manage the portfolios that are consistent with the Business-IT Alignment. This helps DPM to develop and provide appropriate information that is consistent, accurate and reliable with respect to each portfolio to the executive management improving Business-IT Alignment. Similarly ET provides process support for Project Execution. This helps the project to comply with the regulations/rules specified by the customers and deliver right products to the customers thus adding value to Business-IT Alignment. (The references to the previous research were given in Chapter 4 in sections 4.7 through 4.12).

5.3.2 Evaluation of second objective

The second objective is to design and test a framework depicting the relationships among IT governance factors and Business-IT Alignment. The major tasks again to achieve this objective were to create the framework using the output of literature survey and hypothesizing the relationships among different IT governance factors. The overall framework is tested using the Structured Equation Modeling. The Bentler-Bonett Normed Fit Index (NFI) value is 0.99 indicating that the overall fit of the tested model is 99% better than that of an independence model. The inference is that the relationship among the IT governance factors is very good as described in the framework. If the framework is more tending to become complex, NFI values tend to be higher. In order to address this,
another index called NNFI, formerly known as the Tucker-Lewis index is computed. This provides correction for the complexity and the value is found to be “1”. Another important indicator called Root Mean Square Error of Approximation (RMSEA) is computed. This indicates covariance residuals are the differences between the observed and model-implied covariances. An RMSEA value of “0” indicates the difference between observed and model implied covariance is zero indicating a perfect fit. GFI indicates that proportion of observed covariance is explained by model covariance. The value of GFI is 0.99 which indicates a perfect fit. This is very similar to NFI and is impacted by complexity. In order to address the complexity, another indicator called AGFI is computed. The value of AGFI is 0.969 which indicates again a perfect fit. This indicates, the relationship among the IT governance factor in the framework is very good. The calculated CFI (Comparative Fit Index) is also interpreted in the same way as GFI but it is less affected by sample size. Values greater than 0.9 are considered good fitting models. The value obtained is 0.988. So it can be concluded that, the framework describes the interrelationships among various IT governance factors(The references to the previous research were given in Chapter 4 in section 4.14).

In addition to the model fit, the current study also discusses about the direct, indirect and total effects of IT governance factors on Business-IT alignment. The results indicate that the total effects of the IT governance factors on Business-IT Alignment are significant from statistics perspective. These were also explained from Business context and found to corroborate the results from literature. So in conclusion the empirical results obtained, support the relations described in the framework( The references to the previous research were given in Chapter 4 in sections 4.15.3.1 through 4.15.3.9)

The hypothesis results are tabulated in the previous section and null hypotheses is accepted in one instance and in other instances, alternative hypothesis have been accepted.

5.3.3 Evaluation of third objective

The third objective is to understand the views of middle & senior management on the IT governance factors impacting business-IT alignment. From the data analysis, it is
understood that there is no difference between the views of Top and Middle Management with respect to the IT governance factors.

5.4 RESEARCH IMPLICATIONS & RECOMMENDATIONS

5.4.1 IMPLICATIONS FOR THEORY BASE

The implications of this research towards the theory are to build a structure of constructs that is having impact on the Business-IT Alignment and provide a framework.

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 social, intellectual factors and Business-IT Alignment while impacting the Business-IT alignment.

5.4.2 FOR ORGANISATION IN INFORMATION TECHNOLOGY BUSINESS

This framework will be of great use for the IT practitioners as it provides the interrelationship among the practices (ranging from Business Strategy understanding and finally connecting business expectations with benefit realization from IT). The study provides the impact of each of the IT governance practices on Business-IT Alignment. Business Value Planning is the most important exercise coupled with other factors like Develop and Implement suitable architecture, Build Communication Strategy, Enabling Technology and Build Partnership. So the study recommends that the factors are to be prioritized in the order recommended above to yield better results for the business. This would be useful to the practitioners to prioritize their effort in implementing the practices needed during the process journey that offer maximum benefit so that they can obtain best results of Business-IT alignment.
Another important factor is the Portfolio Management (DPM) that describes the process of breaking the IT initiatives into logical portfolios like Transformational, operational and Informational which enable the organizations to allocate budget according to the Business goals/vision which would lead to Business-IT alignment.

The other implication for the IT organization is the benefit realization. The benefits articulated during the Business Value Planning in the form of Value indicators should be realized through the processes like Portfolio Management (DPM) and Project Management (DIM). This would help the organization to get the required returns leading to the Business-IT alignment.

5.4.3 IMPLICATIONS FOR THE SOCIETY

This study helps to reduce the failures of IT thus resulting in savings of lot of money and build in confidence on IT. This would improve employment generation. Further, the improvements in IT would result in providing better services to the community like improvement in banking services, insurance services etc. thus improving the quality of life of the people.

5.5 CONCLUSION

In summary, BVP has got the highest total effect (0.379) on the Business-IT alignment (BIA) followed by DSA (0.369), BCS (0.322), ET (0.312), BP (0.243), DIM (0.154), BHR (0.059), DPM (0.039) and VIT (0.023), so we could infer that understanding of Business strategy, critical business process identification and understanding of the value indicators is playing a critical role. Also the technical architecture mapping with business architecture is playing a vital role in bringing in the Business-IT alignment. Another important inference is the importance of the automation and Process frameworks at the organization level. These will bring in the required discipline and enforce process culture leading to consistency and institutionalization of the practices. Similarly, the enabling factors like BCS are bringing in the importance of communication strategy that is in line with the Business strategy leading to Business – IT alignment.
Also the importance of BP is indicating the importance of building the relationships/partnership among the business and IT groups and knowledge transfer between the business and IT.

DIM is bringing the execution aspect and how the benefits planned in BVP are getting realized through the execution.

Another meaningful inference is that the Top and Middle Management do not have different views on various governance factors impacting business-IT alignment. This becomes very critical during the execution of these practices.

Various factors computed in the model summary like CMIN, GFI, AGFI, CFI, RMSEA, Hoelter Index to understand the framework fit. The factors exceeded the expected values of literature. Hence it is concluded that very good model fit among the IT governance factors is obtained.

5.6 LIMITATION

- As with any study, the results of this study must be evaluated in light of certain key limitations. In this study, the sample consisted of three types of organizations are considered namely System Integration, Product Development and Captive IT Organizations. However focus on a specific segment may yield different model/interrelationships.
- Also 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.

5.7 RECOMMENDATIONS FOR FUTURE WORKS

This research has tried to understand the IT governance practices in major areas such as implementing appropriate IT architecture, Business Value Planning, Vision for IT, Portfolio Management, IT Investment Management and the facilitators of Business-IT Alignment such as Building Communication Strategy, Building Human Resources,
providing Enabling Technology, Building Right Partnerships. However, we need to understand if the requirement of IT governance factors may vary depending on the type of business domain such as Insurance, Banking etc. Also the relationship between different areas and Business-IT Alignment could be explored in detail in specific organizations/specific domains.

External factors (like macro economic trends/Government regulations) have an impact on IT Governance factors and business-IT Alignment. Finally linking the Business-IT Alignment to the firm-performance in the Indian Context could be an interesting area.

The cultural factors can be combined into the framework to understand their impact on Business-IT alignment in conjunction with the Social and Intellectual factors.

The Business-IT alignment might be impacted due to the size of the organization and would be interesting to see how the social, Intellectual and cultural factors play a role.