A COMPARATIVE STUDY OF
BUSINESS MODELS OF INDIAN LIFE SCIENCES
BUSINESS PROCESS OUTSOURCING INDUSTRY

ABSTRACT OF THE THESIS
SUBMITTED FOR THE AWARD OF THE DEGREE OF
Ph. D. (Business Administration)

BY
C. OMPRAKASH

Under the Supervision of

Dr. MOHD. AFAQ KHAN
Assistant Professor
Department of Business Administration
Faculty of Management Studies & Research
Aligarh Muslim University, Aligarh.
(Internal Advisor)

Dr. K. S. GUPTA
Director
KSC Center for Learning and Development
Bangalore.
(External Advisor)

DEPARTMENT OF BUSINESS ADMINISTRATION
FACULTY OF MANAGEMENT STUDIES & RESEARCH
ALIGARH MUSLIM UNIVERSITY
ALIGARH (INDIA)

2012
ABSTRACT

INTRODUCTION

Globalization has been defined by many authors in a variety of ways due to the varied approaches their definitions are based upon, such as economical, political, financial, technological etc. One common thread that comes out of the various definitions that exist for globalization is that globalization is primarily an economic phenomenon, involving the increasing interaction or integration of national economic systems all over the world through growth in international trade, investment and capital flows.

Advances in information technology, specially internet technologies has contributed very significantly to enable worldwide real-time interconnectedness and these technology based innovations and advances have triggered the process of achieving competitive advantage by businesses across the globe, irrespective of the size, nature of business or the geographical location/s of these organizations. In other words, the reality “Globalization forces everyone to compete with the cheapest producers” is brought into stark focus (Friedman, 2006).

To a business leader, this means that there are more challenges than ever from stakeholders such as competitors, customers, investors and regulators. The business also needs to survive, grow revenues, become more agile in the face of competitive and market pressures and provide customers with optimum service. One of the best ways to achieve this is through globalization of the organization. Successful businesses are responding to this phenomenon of “global competitiveness” by optimizing their “business services” through outsourcing and hence attain a differentiation leading to a competitive advantage, from the business perspective.

Outsourcing, primarily involves transferring ownership of an organization’s business processes and activities to a external service provider. For a fee, the outside service provider carries out the activities and maintains responsibility for their outcomes (Chamberland, 2003). Creating value for a business in today’s markets means transforming the organization into a focused, responsive, variable and resilient business and can primarily be achieved through the Business Process Outsourcing (BPO) Model.
In this study, the focus is only on outsourcing of business processes leading to optimization in the Life Sciences industry. The term Life Sciences includes the biomedical, biotechnology, medical devices and the medical diagnostic industries. The generic model framework being evolved in this study creates and implements an effective model that predicts the essential, elemental critical success factors and their relationships which affect business performance of organizations in the Life Sciences BPO Industry.

It has become evident through the literature that over the past decade, biomedical and life sciences companies have entered a difficult period where shareholders, the market and regulators have all created significant pressures for change within the industry. From thinning product pipelines and skyrocketing operating costs to calls for lower prices and a greater regulatory burden, the industry is confronting unprecedented challenges that are expected to radically transform the business.

In an atmosphere of declining research and development (R&D) productivity, mounting pricing pressure and changing regulatory requirements, global biomedical and life sciences companies face increasing challenges to achieve and maintain profitable growth, (PwC, 2006). Global biomedical business process outsourcing offers life sciences organizations an opportunity to overcome these challenges.

**Motivation for this Research**

Although global biomedical business process outsourcing seems to offer life sciences organizations an opportunity to overcome its inherent problems or challenges, understanding the elements and organization structures which control and hence influence the final outcome of this process become very critical. In other words, understanding the elements of the business process outsourcing (BPO) business model, their influences and their relationships can help us predict the effect of the business models on the organization's business performance.

Even though the concept of business model is potentially relevant to all firms, a search of the organization, economic, and strategy literatures, resulted in finding a few articles on the subject, and just one largescale empirical study (Amit and Zott, 2001). Although several authors have provided useful frameworks for analyzing
businesses, such as profit models (Slywotzky, et al. 1997) and strategy maps (Kaplan and Norton, 2004) these approaches are based on a tradition of classifying firms into "internally consistent sets of firms" referred to as strategic groups or configurations (Cool and Schendel, 1987). These groups—typically conceived and organized through the use of typologies and taxonomies (Miles and Snow, 1978) were often used to explore the determinants of performance. None of these authors provided any insight on the biomedical outsourcing elements, typologies, taxonomies and their effects on business performance/success.

There have been very few large-scale systematic empirical studies in the area of understanding the effect of business models on business performance and success in the Indian Life Sciences BPO industry. We do not know, for instance, how common different kinds of business models are in the economy and whether some business models have better financial performance than others.

This brief summary of related literature has motivated this research and this study provides a first attempt to answer these basic questions about business models and their effect on business performance and success in the Indian Life Sciences BPO industry. The research provides a theory-grounded proposal for understanding the effect of business models on business performance and success primarily through an empirical approach. Specifically, the researcher is interested in answering the primary question of whether business models have performance implications.

LITERATURE REVIEW

This research study is part of the new research stream on business models and focuses on a specific area not covered so well until now: specifying, conceptualizing business models, understanding the effect of business models on business performance. Most business model research stays at a non-conceptual, broad and sometimes even vague level and hence this work tries to dig into the details and define a generic model to describe business models and their effect on business performance / success. This approach becomes indispensable if one wants to provide effective business model framework to improve, manage business performance/success in a rapidly moving, complex and uncertain business environment of the Life Sciences BPO industry domain.
Based on the above, a partial outcome of this research is a generic business model framework specific to the Life Sciences BPO industry that ideally represents the foundation for designing and developing new management tools for business performance assessment and business strategy.

A summary of the literature review is presented below:

**Literature review summary**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Summary</th>
<th>Study Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mintzberg (1979); Silverman, (1999);</td>
<td>Concept of Strategy and its effect on Business</td>
<td>Background of Business Models</td>
</tr>
<tr>
<td>Prahalad and Bettis (1986); Tushman and O'Reilly, (1997);</td>
<td>Manager path dependent behavior of business performance</td>
<td>Direction of research on Business Models</td>
</tr>
<tr>
<td>Chesbrough &amp; Rosenbloom (2002);</td>
<td>Business model (BM) as a construct</td>
<td>Existence of Business Models</td>
</tr>
<tr>
<td>Genesereth and Nilsson (1987); Malone et al., (2006);</td>
<td>Definition of a business model</td>
<td>Definition of Business models</td>
</tr>
<tr>
<td>Slywotzky et al., (1997); Kaplan et al., (2004);</td>
<td>Influence of business models on business performance</td>
<td>Business models and business performance</td>
</tr>
<tr>
<td>March and Smith (1995); Alan M. Rugman and Alain Verbeke, (2000);</td>
<td>Process for creation of a generic business model framework &amp; constructs</td>
<td>Identify generic business model framework approaches</td>
</tr>
<tr>
<td>Rappaport, (1986); Copeland, et al., (2000);</td>
<td>Market-based measures - the best possible measures</td>
<td>Best possible measures of organization performance</td>
</tr>
<tr>
<td>Ball and Brown (1968); Robinson (1995)</td>
<td>Return to stockholders provided the most power</td>
<td>Selection of RTS as business performance indicator</td>
</tr>
</tbody>
</table>
Based on literature review, it becomes clear that there exists a relationship between business models and business performance of organizations. Hence determining a specific business model configuration for the specific organization in a specific industry becomes critical for its survival and success.

It is also evident that there are no industry specific models, frameworks, tools which can be applied to create a business model, study effects of varying individual components on business performance and comparing different organizations with their own unique business models. Hence there is a dire need to create an industry specific generic business model framework which can predict business performance of an organization. This should also provide an option for studying the effect of the model on performance when constituent business model variables are manipulated.

**RESEARCH METHODOLOGY**

This part describes the methods and procedures used to identify existing, common business model design elements and their relationships with reference to the external environment, identify and evaluate Critical Success Factors (CSF's), conceptualize and create an empirical generic / reference business model reflecting their relationship and effect on industry performance.

It describes how this generic / reference business model forms the basis to further compare the effect of business model designs on business performance of firms. It also describes the methods used to collect data for use in answering the research questions and testing the research hypotheses. Finally, the chapter ends with an overview of the data analysis methodologies used to test the research hypotheses.

**Research Gap**

On completion of literature review, it became evident that there was a dearth of studies which look into the effect of business models on business performance in the Life Sciences Business Process Outsourcing (BPO) Industry domain. There was also no evidence of research which have studied the effect of business models on business performance in the Indian Life Sciences Business Process Outsourcing(BPO) Industry context.
To fill the existing knowledge gap and satisfy this unmet need, this research study focuses on understanding the effects of business models on business performance in the Life Sciences Business Process Outsourcing (BPO) Industry domain and construct a industry specific generic business model framework which can predict business performance in this specific business domain.

Research objectives

As previously indicated, very few rigorous empirical studies have been conducted to investigate how business models affect business performance and success, and how business model related elemental variables (Critical Success Factors - CSF) influence this effect. Hence, the primary purpose of this study is:

- To increase understanding of how business models can be constructed through the examination of its underlying processes
- To increase understanding of the relationship between business models and business performance/success by taking into account elemental variables (Critical Success Factors - CSF) associated with the business model.

To achieve this purpose, the following major research objectives are addressed:

- Identify constituent elemental critical success factors of business models in the Life Sciences BPO industry using survey questionnaire instrument through multiple pilot studies.
- Identify a set of themes to classify the above identified constituent elemental critical success factors of business models and operationalize them.
- Propose or construct a generic business model framework based on the identified constituent elemental critical success factors and their relationships affecting business performance.
- Identify a business performance and success outcome measure that relates to organizational performance.
- Using the constructed generic business model framework identify and compare business model relationship to business performance of identified Indian Life Sciences BPO organizations.
• Test association of the relationship between proposed business performance values and factual business performance and success values obtained from the above objective.

Accomplishing these research objectives is expected to contribute both to practitioners, by providing guidelines for creating business models which will enhance business performance/success; and to academic research by providing insight, and direction for future research.

Since, research has the ultimate of developing an organized body of scientific knowledge, this research study is being undertaken in order to gain new knowledge and add to existing knowledge through a documented, data-driven approach to the development of scientific knowledge.

Research Questions

Given the pervasive reference to business models in the industry and the dearth of rigorous study on the subject, the researcher believes that research on business models and how these affect and enable organizations to achieve improved performance results under different conditions can contribute greatly to the current body of knowledge. Although this research seeks to represent the proof of causal relationships between business models and business performance/success, it does not attempt to answer deeper questions about why the performance implications exist.

Based on the above, one primary research question to be addressed in this research is:

• How does business model design affect business performance in the Life Sciences BPO domain?

This primary research question in turn gets translated into four sub-questions as follows:

• What are the existing business model design elements in the Indian BPO context?

• How can business models be described and represented in order to conceptualize, define and build reference or generic business model framework?
• Can this generic business model framework be used to identify and compare existing business models OR Can an efficient business model design be determined by comparing models of different Indian BPO firms?
• How can a specific business model with value constellations be built for the BPO domain?

Research Hypotheses

To achieve the objectives of this research, the following initial hypotheses were investigated. These hypotheses were developed based on the requirement of the study in answering the research question/s.

• Null hypothesis (H₀) : An organizations' business performance is independent of its business model.

• Alternate hypothesis (Hₐ) : An organizations' business performance depends on its business model.

Due to dearth of research studies, the research was designed in such a way that on identifying elemental CSF’s, themes and exposing the respondent data set to exploratory factorial analysis, working hypothesis could be formulated depending on the factor solution obtained after EFA. Based on the obtained four factor solution (post EFA), we arrived at the following set of working hypothesis (Null(Hₐₙ) and Alternate (Hₐₙ) where n = 1, 2, ..., x):

• H₀₁ : An organizations’ business performance is independent of “Customer Factor”.

• Hₐ₁ : An organizations’ business performance depends on its “Customer Factor”.

• H₀₂ : An organizations’ business performance is independent of “Organization Factor”.

• Hₐ₂ : An organizations’ business performance depends on its “Organization Factor”.

• H₀₃ : An organizations’ business performance is independent of “Industry/Sectoral Factor”.


• **HA3**: An organization's business performance depends on its "Industry/Sectoral Factor".

• **H04**: An organization's business performance is independent of "Environmental Factor".

• **HA4**: An organization's business performance depends on its "Environmental Factor".

Since the study was designed to compare two rank variables to measure the strength of association between business models and business performance, or lack of it, the following working hypothesis was also tested.

• **H05**: There is no association between model based ranks and RTS based ranks of an Indian Life Sciences BPO organization.

• **HA5**: There is association between model based ranks and RTS based ranks of an Indian Life Sciences BPO organization.

**Research Design**

There is limited research that have studied the relationship between business models and business performance and success, especially in the Life Sciences BPO industry domain. Based on this, the study was designed to start with an initial limited exploratory design (LED) phase and then move into the conclusive research design (CRD) phase. The empirical investigation through survey research was intended to improve generalizability of the analysis of the interrelationship between business' models and its impact on business performance.

The initial, limited exploratory research design (LED) phase was adopted due to the need for rich data that could facilitate the generation of theoretical categories that could not be derived satisfactorily from existing data (Locke, 2001). In the LED phase, secondary data was utilized initially to identify at least some of the elemental CSF's. Since this identified very few elemental CSF's, it was followed with collection of primary data through five pilot studies.

Data from this stage was used to identify elemental critical success factors (CSF) of business models in this domain and categorize them into themes. This formed the basis for creating the survey instrument which was used in the next stage of the study.
The final survey instrument with 46 elemental CSF's and 8 themes was arrived at after content validity and reliability analysis.

In the CRD phase, the causal research design was utilized to collect primary data through a large-scale research survey. Data was collected using a web-based survey questionnaire response system through organizational informants who participate in their organization's outsourcing initiative in various roles. Based on data obtained through this large scale survey, the 8 themes with their constituent elemental CSF's were reduced using exploratory factor analysis (EFA) to yield a more manageable four factor solution based on the relationships between these elemental CSF's.

The study was also designed to collect business performance metric data in the form of returns to shareholders (RTS) which was calculated from organization specific financial data collected using secondary sources. This business performance data and the four factor solution were used to construct a generic business model framework for Life Sciences BPO organizations.

The last and final Comparative study phase of this study was designed so that primary data was collected through a limited survey using a set of respondents working in Indian BPO/CRO Organizations who were different from those who took part in the large scale research survey study.

Based on total respondent scores, arrived at after applying the individual four factor scoring scores to individual survey instrument response, different business models were identified. In summary, 33 business models were identified and organizations were ranked on the total respondent score. Applying the generic business model network on these 33 identified business models individually, yielded an organization specific business performance metric (predicted RTS). This organization specific predicted RTS value was used to compare the participating Indian Life Sciences BPO organizations. On completion of this phase a total of 21 unique business models were identified and compared.

The final step, organization specific financial data from secondary sources which identifies the identified business performance measure RTS were collected for the specified Indian companies. The predicted RTS and the actual RTS were also analyzed for any association to determine the robustness of the proposed generic business model framework.
Population and Sample

The primary objective of this research is to evaluate the impact of Life Sciences BPO industry Business Models on business performance; therefore, outsourcing professionals from Business Outsourcing functions (Customers as well as service providers) at the organizational level are appropriate subjects. These participants are assumed to have direct experience with business process outsourcing and possess knowledge about their organization and service provider/customer performance. Based on these assumptions, the target respondents included in this research were selected so that they satisfied the above.

The selection criteria were defined to ensure that respondents have the best knowledge about the Life Science outsourcing industry and have direct experience with the outsourcing function and hence were capable of providing useful inputs. Further, as this research aimed to develop a measurement instrument that could be applied in to either private or public organizations, no restriction in types of organizations were applied.

Since there is no readily available database for this population, the purposive sampling frame was originally set to Life Sciences outsourcing organizations across all geographies. Considering the sample size required, costs and disadvantages of postal survey, it was decided that an electronic survey would be more appropriate, given that the target respondents would all have internet access.

The e-mail addresses of the respondents who satisfied the indicated criteria were identified online primarily on the LinkedIn Professional Group “Life Sciences Outsourcing” through the researcher’s networks and several outsourcing online networks in LinkedIn to provide the required sampling frames for this study. All the professional groups selected in this study to complete the sample frame had specific entry gate criteria. For example, the LinkedIn group Life Sciences Outsourcing is a regulated group which has an entry gate criterion in the sense that this is an exclusive group for professionals in the outsourcing industry and has around 1495 members.

In summary, the final samples comprised of organizations worldwide and included members of online forums and members of researcher’s networks who have the best available knowledge of the life science outsourcing industry and have direct experience with the outsourcing function in the life sciences industry.
Data Collection Procedure

Elemental CSF Study Data Collection: In total, 2857 invitations were sent out to a much focused sample frame and at the end of the survey window, 347 responses were submitted/received. The response rate was 12.15% considering that some of the respondents preferred not to participate or would not have received the e-mail itself due to an active/enabled spam filter in their e-mail program.

243 (71.67%) out of 347 received survey responses were considered for the analysis. This data was then analyzed using exploratory data analysis (qualitative) techniques and exploratory factor analysis to arrive at a four factor solution. This four factor solution identifies elemental critical success factors (CSF’s), corresponding themes of these CSF’s and their relationships which influence or affect business performance of Life Sciences BPO organizations.

Business Performance Parameter Data Collection: Out of the 243 useful responses received, a total of 117 respondents had indicated either the division in which they were working and or the organization to which they were affiliated. A total of 28 Customer organizations and 18 service provider organizations were selected from the above based on specific collection criteria, for this stage of data collection.

After selection of the organizations, factual secondary financial data were collected from standard financial resources, financial websites and the specific organizations' website to arrive (calculate) at the business performance metric — Returns to shareholders (RTS) value for the specific organization.

This data was then analyzed using quantitative data analysis techniques (multiple regression analysis, Analysis of variance (ANOVA)), to construct a generic business model framework. This constructed framework depicts the identified essential elemental critical success factors (CSF’s), their internal relationships and the effect or influence or relationship of these identified CSF’s on the business performance metric returns to shareholders (RTS).

Comparative Study Data Collection: Based on the four factor solution arrived at, after exploratory factor analysis (EFA), a second questionnaire was created by utilizing elemental critical success factors identified. This questionnaire was sent to pre selected organizations and respondents working in those specific organizations.
In total, 45 invitations were sent out to a much focused sample frame and at the end of the survey window, 36 responses were submitted/received. The response rate was 73.35% as only 33 of the received responses were considered usable since 3 incomplete responses were lost to follow-up. The response rate for this survey is high due to the fact that the sample size was small and there was a vigorous follow-up through personal calls to ensure the survey was completed and returned.

Based on total respondent scores, arrived at after applying the individual four factor loading scores to individual survey instrument response, 33 different business models were identified. Applying the generic business model framework on these 33 identified business models individually, yielded an organization specific business performance metric (predicted RTS). This organization specific predicted RTS value was used to compare and create a ranked list of participating Indian Life Sciences BPO organizations.

Of the 33 business models identified, 21 were unique business models in the sense that they had unique respondent scoring values. From the above data the 21 unique business models were analyzed to determine an association between generic business model framework predicted business performance (RTS) and actual business performance based on factual RTS (organization specific financial data from secondary sources).

Survey Instrument Development

Generally accepted principles of instrument design was used in this research to develop measures of Business Model Elements so that the survey instrument so generated could identify the critical success factors for India based Life Sciences BPO industry and their relationship to business success or performance. The general six steps procedure laid out by Hinkin (1998) was followed for development of the instrument.

Based on literature survey an initial one hundred and twenty one (121) items/categories/components and twenty six (26) significant themes were identified. To validate these identified significant themes and items / categories / components, multiple survey based pilot studies were undertaken. By grouping similar items/categories/components and applying the method of "Critical Success Factors
(CSF)” (Rockhart, 1979; Rockhart, 1981; Richard, 2004) on data obtained from the above studies, fifty two (52) items / categories / components / "Critical Success factors (CSF)” (initial survey items) were identified. The CSF’s so identified were content analyzed to identify and categorize them under eight (8) significant themes “Sources of CSF” to guide the development of individual survey items.

In the final stage, the content and reliability of scales were evaluated through content validity assessment and reliability analysis. The final survey instrument consists of eight (8) Source of CSF’s (significant themes) namely: Strategy, Human Resources, Operations, Marketing, Finance, Environment, Industry and Innovation. Under these Source of CSF’s, a total of forty six (46) Critical Success Factors (business model elements) are included. Source of CSF – Strategy includes 8 CSF’s, Human Resources includes 5 CSF’s, Operations 3 CSF’s, Marketing 7 CSF’s, Finance 7 CSF’s, Environment 6 CSF’s, Industry 6 CSF’s and Innovation 4 CSF’s.

**DATA ANALYSIS AND DISCUSSION**

This study has utilized the techniques of descriptive statistics, validity testing, reliability testing, exploratory factor analysis, regression analysis and tests for hypothesis. Microsoft Excel 2007 was used for initial data collection and data cleaning. Statistical software program SPSS 17.0 for Windows was employed to analyze the data collected in this study. As indicated previously, analysis was performed on 243 usable respondents’ data out of the received 347 responses from 2857 participation invites sent to potential respondents. This data was used to identify and thematize elemental CSF’s into themes and reduce them to arrive at a more manageable four factor solution using Exploratory Factor Analysis.

Business performance metric RTS was then calculated for 46 Life Sciences BPO organizations and multiple regression analysis procedure was used to construct the generic business model framework. Based on comparative study respondent scoring, and applying the generic business model framework, various, existing business models were identified, compared and ranked accordingly. Spearman’s rank correlation procedure was used to finally test the association between predicted RTS value (from the model) and factual RTS values of organizations which would also test robustness of the proposed generic business model framework.
Out of the 243 respondents, 7% constituted BPO Service Providers (Service providers providing BPO services), 28% CRO (Clinical Research Organization) Service providers (Service providers providing CRO services), 24.3% BPO Customers (characterized as respondents who require BPO Outsourced services) and 40.70% of CRO Customers (characterized as respondents who require CRO Outsourced services).

Methodology used in the survey, to identify critical success factors that affect business performance were based on a 5-point scale with preset response possibilities. The weighted average for each element under Critical Success Factor Themes were arrived at to understand the importance of each elemental critical success factor under a specific CSF theme (eg: Elemental CSF “Physical Infrastructure” under the theme “Strategic CSF’s”) and their relationships if any.

Average of CSF themes ranked by degree of importance

<table>
<thead>
<tr>
<th>SL.</th>
<th>Critical Success Factors</th>
<th>WEIGHTED AVERAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OPERATIONS</td>
<td>4.10</td>
</tr>
<tr>
<td>2</td>
<td>INNOVATION</td>
<td>4.05</td>
</tr>
<tr>
<td>3</td>
<td>STRATEGY</td>
<td>3.92</td>
</tr>
<tr>
<td>4</td>
<td>FINANCE</td>
<td>3.88</td>
</tr>
<tr>
<td>5</td>
<td>HUMAN RESOURCES</td>
<td>3.86</td>
</tr>
<tr>
<td>6</td>
<td>MARKETING</td>
<td>3.68</td>
</tr>
<tr>
<td>7</td>
<td>ENVIRONMENT</td>
<td>3.67</td>
</tr>
<tr>
<td>8</td>
<td>INDUSTRY</td>
<td>3.52</td>
</tr>
</tbody>
</table>

On summarizing, the weighted average of all theme critical success factors, Operations with a weighted average of 4.10 stands out as the most important CSF theme essential for business success. Next comes Innovation with a weighted average of 4.05 followed by Strategy with a weighted average of 3.92. The effect of industry related elemental CSF’s have the least effect on business success.

In conclusion, elemental success factors under the CSF Theme Operation and Innovation (GROUP 1) influence business success of Life Sciences BPO industry to a maximum extent respectively. Strategy, Human resources and Finance CSF themes (GROUP 2) in that order, are the next group of theme CSF’s which influence business success in this industry to a large extent when compared to CSF themes Operation and Innovation.
Marketing and Environment theme CSF’s (GROUP 3) form the third group of theme CSF’s which affect business success in this industry. In terms of their quantitative influence, they lag behind Strategy, Human resources, Finance CSF themes and Operation, Innovation themes.

The Industry CSF (GROUP 4) theme is quantitatively the least influencing theme on business success when compared to Marketing, Environment theme CSF’s, Strategy, Human resources, Finance CSF and Operation, Innovation themes. Figure 4.16 given under Annexure VI helps us visualize the grouping of theme CSF’s based on their weighted averages.

In summary, we can conclude that the 46 elemental CSF’s can be grouped into 8 Theme CSF’s and based on qualitative analysis we can further categorize them into four groups based on their quantitative influence on business success of the Life Sciences BPO industry. The quantitative influence of each theme CSF is arrived at by considering their weighted average. Based on this we can create a qualitative or exploratory model which depicts the effect of CSF’s on business success, through a cause and effect diagram (Figure 4.a) which would help visualize the critical success factor themes, the most important elemental CSF’s under a specific theme, their relationships and their weightages in affecting business success in the Life Sciences BPO Industry.

**Exploratory Factor Analysis**

The next step in data analysis was to discover simple patterns in the pattern of relationships among the Critical Success Factor variables and in particular, seek to discover if the observed variables can be explained largely or entirely in terms of a much smaller number of variables. According to Kline (1994), Factor analysis consists of a number of statistical techniques the aim of which is to simplify complex sets of data and in social sciences factor analysis is usually applied to correlations between variables.

Principal component analysis (PCA) was used for factor extraction to obtain estimates of the initial factors that account for the largest variance in the sample. Table 4.20 shows the initial statistics generated for the candidate critical success factors. The rule used to finally determine the number of factors to include was Kaiser criterion (all
factors with eigen values greater than one) (Kaiser, 1974) and the scree test. For the critical success factors this resulted in a four factor solution which explains 100.00 percent of the variation. Subsequently, varimax rotation with Kaiser normalization was chosen as the method of transforming the initial factors into a more meaningful configuration.

Factor loadings resulting from the varimax rotation were evaluated using the threshold of 0.35, level recommended by Churchill (1979). Only items with factor loadings of 0.35 and above were considered to be included under each of the factors of the four factor solution.

Based on results from the above procedure, and by logically grouping the identified critical success factors under the four factor solution we can name the identified four factors as Customer Factor (Factor Score : 22.039), Organization Factor (Factor Score : 11.109), Industry/Sectoral Factor (Factor Score : 4.097), Environmental Factor (Factor Score : 0.788).

Out of the 243 useful responses received, a total of 117 respondents had indicated either the division in which they were working and or the organization to which they were affiliated. A total of 28 BPO and 18 CRO service provider organizations were selected and ranked from the above 117 respondents for this stage of data analysis – for calculating the RTS value for specific organisations. RTS value was calculated using the standard formula \[\text{Return on share holder's investment} = \frac{\text{Net profit (after interest and tax)}}{\text{Share holder's fund}} \times 100\] for individual organizations.

Based on ranking of the organizations considering their RTS value, it is evident that BPO organizations are better performers than the CRO organizations in terms of RTS. The top 11 rankings consecutively in the above table are for BPO organizations followed by 10 CRO's and subsequently, 13 BPO’s have a consecutively higher rank compared to 5 CRO’s in terms of their RTS value.

**Generic Business Model Framework**

On applying the multiple regression method using the “enter” option, with calculated business performance as the dependent variable and Customer Factor, Organization
Factor, Industry/Sectoral Factor and Environmental Factor as the independent / predictor variables, the following significant model emerged:

\[ F_{44t} = 21.952, p < 0.0005. \text{ Adjusted R square} = 0.651. \]

In other words, the represented model accounts for 65.10 percent of variance (adjusted R square value) and the overall significance of the model is less than 0.0005 (p value).

Significant predictor variables of the model are also arrived at during this stage of analysis. According to Brace et al., (2006) the beta value (standardized regression coefficients) is a measure of how strongly each independent/predictor variable influences the dependent variable. Based on this, we can conclude that the independent variable Customer factor with a beta value of 2.486 and a p of \(< 0.0005\) has the greatest impact on business performance. This is followed by the Organization factor (beta = 1.729; p < 0.0005) and the Industry/Sectoral Factor (beta = 1.164; p < 0.0005). It also emerges that the Environmental factor (beta = 0.548; p < 0.0005) has the least influence on business performance when compared to the other three.

According to Gaur and Gaur (2006), the regression coefficients and their significance obtained by applying multiple regression procedure on the available data, can be used to construct an ordinary least squares(OLS) equation. This equation is constructed by using the "Constant" corresponding to the un-standardized "B" value and standardized coefficients "Beta" values for four factors (F1, F2, F3, F4). The equation is represented below:

Business Performance(RTS) = -81.725 + 129.788 (F1) + 105.812 (F2) + 99.756 (F3) + 105.134 (F4). (where F1= Customer Factor; F2= Organization Factor; F3= Industry/Sectoral Factor; F4= Environmental Factor).

The model above (ordinary least squares(OLS) equation) represents the "quantitative influence" of the four individual factors in the four factor solution to predict business performance of organizations in the Life Sciences BPO industry domain. In other words, it also represents the generic / reference business model framework which reflects the relationships of elements (critical success factors) and their effect on industry performance of businesses in the Life Sciences BPO Industry Domain (illustrated below).
At the center of the above illustration lies business performance, illustrated as a huge circle. Big circles surrounding this with the descriptions of F1, F2, F3, F4 (corresponding to Customer Factor, Organization Factor, Industry/Sectoral Factor, Environmental Factor respectively) represent individual themes arrived at from the EFA(four factor solution) stage of the study. Smaller circles connected through lines
to these “big theme circles”, with descriptions like H1, O4, F2 etc., represent elemental CSF’s corresponding to elemental CSF’s categorized / thematized under one of the four themes obtained from the four factor solution.

The numbers (values) on the lines connecting elemental CSF’s to their parent themes represent the strength of influence of that particular elemental CSF on that specific theme. Hence these numbers indicate the magnitude of influence a particular elemental CSF has on the theme and hence business performance and success. For example, the magnitude of influence of elemental CSF H3 is 0.993 on theme F1 compared to that of N3 which has a magnitude of 0.683. This shows that the quantitative influence of elemental CSF H3 is 0.993 on F1 when compared to that of elemental CSF N3 which has a quantitative influence of only 0.683 on the theme or factor F1.

Stronger the theme’s effect on business performance and success, larger is its overlap with the business performance circle in the illustration above. For example, since theme F1 has the most influence on the outcome (business performance, success) the amount of overlap of the F1 circle with the Business performance circle is larger compared to that of theme F4.

**Hypothesis Testing**

Although existing literature refers to the effect of business model on business and industry performance Malone et al. (2006), Zott and Amit (2002), there was very limited literature on identified critical success factors, their relationships and effects on business performance in Life Sciences BPO Industry. Moreover, there were no published literature on identifying critical success factors affecting business performance and their relationships specifically with reference to the Indian Life Sciences BPO Industry. The reviewed literature on business models for the Life sciences BPO industry provides only a limited scope to identify significant themes and derive satisfactorily theoretical items / categories / components (critical success factors) affecting business performance.

Due to this limitation, the study was designed and research carried out to identify elemental critical success factors, their category themes, relationships between these elemental critical success factors and their effect on business performance of Life
After identifying the critical success factors, their relationships and the nature of their effect on business performance, the hypothesis that "(H₀) : An organization’s business performance is independent of its business model" was tested.

To test the above hypothesis, the strength of the relationship between two variables, RTS values obtained from factual financial data and scores obtained for organizational business models were tested. The scores for organizational business models were considered from responses of 46 individual respondents of organizations out of a total of 28 BPO and 18 CRO service provider organizations selected from 117 respondents.

Pearson’s test for bivariate correlation was utilized to test for correlation between the above indicated variables. When one interprets results of the Pearson’s correlation test it becomes evident that there is correlation between Business Performance (RTS value) and Business Models (Respondent Scores). We can observe that the correlation coefficient between Business Performance and Business Models is 0.689 and the p value for two-tailed test of significance is less than 0.0005. From this we conclude that there is a positive correlation between Business Performance and Business models at the significance level of 0.01. Due to this, we reject the null hypothesis H₀ which in turn means that Life Sciences BPO organizations business performance is dependent on its business model.

Since this research study is exploratory to a limited extent in nature, it was not possible to develop a more comprehensive set of a priori hypotheses. However, an initial working hypothesis as described above was arrived at and post conduct of the exploratory factor analysis, the factors observed as a result of the factor solution were used to construct further working hypothesis as described below. On identifying elemental CSF’s, analyzing the themes and exposing this data set to exploratory factorial analysis we arrived at a four factor solution. Furthermore, to have a better insight into critical success factors, and the influence of these four component factors on business performance, 4 working hypothesis which evaluated the dependence of these individual four factors on business performance were tested.

According to Gaur and Gaur (2006), if the null hypothesis states that there is no relationship (independent) between variables under study, (in this case business
performance and “Customer Factor”) the beta coefficient ((standardized regression coefficients) obtained using multiple regression analysis and ANOVA) should not be different from zero.

The beta coefficient value (2.486) for the Customer Factor (F1) is at a significance of <0.0005 (p value). Since the beta value is not equal to zero, we reject the null hypothesis and accept the alternate hypothesis. So, we conclude that the business performance of an organization is related to or dependent on its “Customer Factors”. Similarly, the beta coefficient and p values for Organization Factor (F2) are 1.729 and < 0.0005 respectively, due to which we reject the null hypothesis and conclude that performance of an organization is related to or dependent on its “Organization Factors”. The beta coefficient and p values for Industry/Sectoral Factor (F3) are 1.164 and < 0.0005 respectively. Due to this we reject the null hypothesis $H_{03}$ and conclude that performance of an organization is related to or dependent on its “Industry/Sectoral Factors”. For Environmental Factor (F4) the beta coefficient value is 0.548 and $p < 0.0005$. Based on this we reject the null hypothesis $H_{04}$ and conclude that performance of an organization is related to or dependent on its “Environmental Factors”.

The above provides us with sufficient evidence that to conclusively conclude that business performance of any organization in the Life Sciences BPO Industry domain depends positively on Customer Factor, Organization Factor, Industry/Sectoral Factor and Environmental Factors. Since these are constituent of business models unique to this industry segment we conclude that business performance of Life Sciences BPO organizations depend on their business models.

**Comparative Analysis**

On completion of hypothesis testing, the next conclusive step in this study was to compare the values obtained by applying the generic business model to values of business performance obtained using factual data to individual organizations.

Rank based hierarchical lists were constructed using data collected through:

- Completed, useful comparative analysis questionnaire received from 33 respondents, (“Hierarchy list of organizations based on the Generic Business Model”) and
By obtaining market performance metric Returns to shareholders (RTS) based on factual financial data ("Hierarchy list of organizations based on RTS Market Performance Measure").

The first part of this comparative analysis was carried out on data received through 33 useful survey responses. Survey responses of each respondent from the specific organization were used to "run" the constructed generic business model framework described above. The output of this process was the "predicted business performance metric (RTS)". This corresponds to the anticipated business performance or success value for that particular organization based on available/existing essential, elemental CSF's in that particular organization. These existing elemental CSF correspond to those identified by the four factor solution as essential for business performance of India based Life Sciences BPO organizations.

A second questionnaire was created by utilizing elemental critical success factors identified by the four factor solution arrived at through Exploratory Factor Analysis. These identified factors were placed in the same sequence as dictated by the four factor solution based on the individual factor loading value of the individual elemental critical success factors. Essential verbal modification of these elemental critical success factors to ensure a better understanding of each of these elemental factors were only applied for creating this questionnaire for comparative analysis. The verbal modification was strictly enforced to introduce a more sentence based critical success factors description since the questionnaire was exposed to respondents as is, without further categorization under specific themes.

This questionnaire was sent to pre-selected organizations and respondents working in those specific organizations which were selected based on specific criteria. The organization selection criteria were defined to ensure that the researcher would have direct access to unbiased, statutory information to help evaluate business performance based on selected financial parameters. The respondents' criteria were defined to ensure that they have the best knowledge about the Life Science outsourcing industry and have direct experience with the outsourcing function and hence were capable of providing useful inputs.

Using the above described screening process, a total of 45 invitations were sent out to a much focused sample frame and at the end of the survey window, 36 responses were
submitted/received. The response rate was 73.35% as only 33 of the received responses were considered usable since 3 incomplete responses were lost for follow-up. The response rate for this survey is high due to the fact that the sample size was small and there was a vigorous follow-up through personal calls to ensure the survey was completed and returned.

On completion of the survey window, data collected was cleaned as mentioned previously and made ready for further analysis. The questionnaire was designed such that the respondents had to answer either YES or NO to each of the questions based on the availability of that particular factor, parameter, competency etc., in their organizations. Each YES was scored 1 and NO a zero. These values indicate existence or non-existence of specific essential CSF's which influence business performance and success of Indian Life Sciences BPO Industry.

The sum of the above responses corresponding to each of the four factors were then calculated and used for further analysis. The quantitative generic business model framework was applied to the calculated response values as described to each of the 33 responses. The difference in these derived values indicate essential CSF's existing in an organization and hence the uniqueness of that specific organization's business model in this specific industry segment.

Out of 33 derived values depicting 33 different organizations specific business models, only 21 business models were identified as unique (non-duplicate derived business model values). Data presented also helps us better understand the differences or uniqueness of the business models of specific organizations. For example, BMODI is Business Model type 1 and consists 11 essential CSF's out of 26 essential CSF's of the Customer factor (F1) theme, 8 essential CSF's out of 14 essential CSF's of the Organization factor (F2) theme, 0 essential CSF's out of 5 essential CSF's of the Industry/Sectoral factor (F3) theme and 0 essential CSF's out of 1 essential CSF of the Environment factor (F4) theme. These characteristics of the business model are exhibited by Indian BPO organizations BP5, B13, and B17. Based on these characteristics, the generic business model framework value obtained for this specific business model was 2192.439.

In other words, business models having the above characteristics would have a predicted business performance and success value (RTS) of 2192.439. So, a higher
generic business model framework value indicates that the specific business model would help the organization perform better compared to other organizations with different business models.

The above identified 21 unique business models were then compared and ranked based on the predicted business performance value to obtain a hierarchy list of organizations called – “Hierarchy list of organizations based on the Generic Business Model”.

From the above list it becomes clear that, on comparison of 21 unique business models of 33 different organizations, organization “BP7” (BPO Service Organization 7) with a business model of the type “BMOD21” would provide or exhibit highest business performance(Ranked 1) measured as RTS when compared to other organizations with different business models in this sample set.

Business model “BMOD21” exhibits the following characteristics:

- Consists 44 elemental CSF’s when compared to that of the required 46 elemental CSF’s based on the generic business model framework
- Consists 25 out of 26 essential CSF’s of the Customer factor(F1) theme,
- Consists 13 out of 14 essential CSF’s of the Organization factor(F2) theme,
- Consists 5 out of 5 essential CSF’s of the Industry/Sectoral factor(F3) theme
- Consists 1 out of 1 essential CSF of the Environment factor(F4) theme
- Predicted RTS value is 5142.445 out of the maximum expected (predicted) RTS value of 5378.045.

Organizations “BP9” and “BP18” both have the RTS predicted value of 5042.69 and hence have a mean ranking of 2.5, which means both these organizations have similar business models which predict similar business performance (RTS) values.

In this study, out of the 33 organizational business models compared only 21 unique business models were identified with 4 organization in the CRO (Clinical Research Organizations) group and 8 organizations in the BPO (Business Process Outsourcing Organizations) group exhibiting similar business models with similar predicted RTS values. In other words all these similar organizations should have almost similar business performance (RTS) and business success outcomes.
This is not surprising since identifying a USP for various organizations in this industry sector is quite difficult as organizations primarily differ more on quantitative terms rather than qualitative terms. For example, in terms of global operational footprint – one organization may have a presence in say 6 different geographies with 1000 employees whereas another firm may have an operational presence in say 3 geographies but with the same number of employees.

For the second part of this comparative analysis as all the organizations selected were publicly traded appropriate sources (annual reports and stock trading exchanges – when required) were used to collect factual data to carry out the process of generating the “Hierarchy list of organizations based on RTS Market Performance Measure”.

Based on this, financial data obtained from legitimate sources for each of these 21 organizations with unique business models were analyzed by applying the RTS measure and ranked based on the results obtained. The first organizations in the list of 33 organizations with similar, predicted RTS values were considered for analysis at this point. As the study focuses on comparing unique business models the above indicated procedure was utilized to generate the list named – “Hierarchy list of organizations based on RTS Market Performance Measure”.

Understanding the association between predicted RTS value and factual RTS value would be helpful. Hence as the next step we compare rankings based on predicted RTS value (arrived at by applying the generic business model framework to respondent data) and rankings based on factual RTS value (obtained through secondary research).

Since we had to compare two rank variables to measure the strength of association or lack of it, the Spearman’s Rank Correlation statistical test was applied to both the hierarchy lists (“Hierarchy list of organizations based on the Generic Business Model”; “Hierarchy list of organizations based on RTS Market Performance Measure”). This was done to determine the association between the generic business model framework predicted RTS value conceptualized through this study and the factual market performance metric (RTS) to understand association between both these parameters if any through a hypothesis.

A Spearman's Rank Order correlation was run to determine the relationship between 21 organizations' generic business model framework predicted RTS value and factual
RTS derived data. It was observed that there is a strong, positive correlation between generic business model framework predicted RTS values and factual RTS derived data, which was statistically significant ($r(19) = 0.526, p = 0.014$).

Since there is a strong statistically significant association between the two rank scores we reject the null hypothesis ($H_0$) in this case and accept the alternate hypothesis. From the above it is clear that the predicted business performance and success metric values (RTS) have a positive correlation with factual business performance measure (RTS). Hence ranking of 33 organizations exhibiting 21 unique business models based on predicted RTS values obtained by applying the constructed business model framework clearly indicates comparison and ranking of organizations based on business performance.

In other words this test proves that there is an association between the generic model generated RTS values and factual RTS values for Indian Life Sciences BPO organizations. Hence this constructed generic business model framework can also be used to theoretically evaluate the success of a business model in the Indian Life Sciences BPO domain.

**CONCLUSIONS AND LIMITATIONS**

This chapter provides conclusions of the research study and managerial implications along with limitations of this study.

Overall, this research is aimed at improving the understanding of heterogeneity in business performance among organizations in the Indian Life Sciences BPO Industry. According to Slywotzky et al., (1997), Timmers, (1998), Tapscott et al., (2000) and Kaplan et al., (2004), this difference on why some firms do better than others is explained in the form of “business models”.

Based on the work on various authors such as Magretta (2002), Petrovic et al., (2001), Timmers, (1998), Weill and Vitale (2001), Osterwalder and Pigneur, (2002), Ghaziani and Ventresca (2002), Rappa (2003) to name a few, the researcher defines a business model as “an essential conceptual structure that contains a set of elements (critical success factors) and their relationships that allows expressing an organization’s unique strengths required to attain business success.”
Hence, understanding the relationship between business models and business performance of organizations in the Indian Life Sciences Business Processing Outsourcing (BPO) Industry would help us better understand, explain and control the heterogeneity of business performance and success of various organizations in this specific industry segment.

From literature review, it is evident that there are no industry specific models, frameworks, tools which can be applied to create organization specific business models and compare these organizations based on their business performance. On comparison we can empirically understand the relationship between business models and business performance of organizations belonging to this specific industry.

Due to the lack of models or frameworks required to create business models, this study constructs a industry specific generic business model framework which is then used to identify existing business models, study, compare relationships and predict business performance of organizations.

Elemental Critical Success Factors

In conclusion, the research study finally lead to identification of 46 elemental critical success factors and eight themes under which these 46 elemental CSF were categorized.


2. The eight identified themes were: Strategy (made up of 8 elemental CSF), Human Resources (5 elemental CSF), Operations (3 elemental CSF), Marketing (7 elemental CSF), Finance (7 elemental CSF), Environment (6 elemental CSF), Industry (6 elemental CSF) and Innovation (4 elemental CSF).

3. Four groups containing specific themes were identified to influence business performance in order of decreasing magnitude. These include Operation and Innovation (GROUP 1), Strategy, Human resources and Finance CSF themes (GROUP 2), Marketing and Environment theme CSF’s (GROUP 3), Industry CSF (GROUP 4).

4. Constituent elemental CSF which has maximum influence on the theme Operations is Global delivery competency of the organization, for Innovations it is Technological innovation, for Strategy it is Management commitment, for Human resources - Skills & Attitudes of the resources, for Finance - Customer Focused practices, for Marketing - Customer Relationship & Management, for Environment - Regulatory and for Industry it is Bargaining power of buyers respectively.

5. The elemental CSF and the themes identified are extensive as they include factors under industry view, firm/organizational view, environment factors, technology factors, marketing factors, corporate factors, finance factors and innovation factors. This study has identified and includes elemental CSF’s under all categories of construct themes of business models which affect business performance as identified by various authors.

To the researcher's knowledge, this is a new contribution to the literature on identifying elemental critical success factors essential in business models of Life Sciences BPO industry and attempts to provide an empirical platform to understand heterogeneity in business performance of various organizations with different business models in this specific industry. As there are no similar precedents in the literature, comparing or contrasting this with other research findings is not possible. However, there is strong support in the literature with reference to the methodology which has been used to arrive at these results.
Business Model Framework Construction

The generic business model framework specific to the Life Sciences BPO Industry was constructed based on the identified elemental CSF's and their relationships influencing business performance and success.

1. The study identified a Four Factor Solution which included Customer factor (comprising 26 elemental CSF's), Organization factor (14 elemental CSF's), Industry/Sectoral factor (05 elemental CSF's), Environmental factor (01 elemental CSF).

2. Customer factor has maximum influence on business performance and success of an organization represented by Returns to Shareholders (RTS) followed by Organization factor, Industry/Sectoral factor and Environmental factors respectively.

3. The generic business model framework accounts for 65.10 percent of variance (adjusted R square value) with an overall significance of less than 0.0005 (p value).

4. This generic business model framework constructed with 46 elemental CSF's, clearly and quantitatively depicts business models and their influence on business performance and success of organizations operating in the Life Sciences BPO Industry.

5. This framework or tool can be used to identify and classify business models existing in the Life Sciences BPO Industry. It can also be used to study and predict cause effect relationships between business models and business performance of organizations operating in the Life Sciences BPO Industry domain.

Again, to the researcher's knowledge, this is a new contribution to the literature on constructing a generic business model framework specifically for the Life Sciences BPO Industry. This attempts to provide an empirical tool to identify, classify and predict the effect of business model components on business or organization performance. This also confirms to research by Roquebert et al., (1996), Brush et al., (1997), McGahan et al., (1997), Chang et al., (2000), Bowman et al., (2001), Amit et al., (2001), Lubatkin et al., (2001), McNamara et al., (2003), and Vilmos et al., (2006) which proposes and confirms the view that elemental components of business models influence business performance.
Hypothesis Testing

Overall, five hypothesis were identified in the study and were tested to determine the independence or dependence of an organization’s business performance on its business model. In conclusion this research study demonstrates that:

1. Heterogeneity in business performance of organizations in the Life Sciences BPO Industry domain is positively influenced by the organizations’ business model. Higher the business model score for an organization, higher is its business performance, measured as Returns to Shareholders (RTS).

2. The business performance of an organization in this domain depends positively and directly on Customer Factor, Organization Factor, Industry/Sectoral Factor and Environmental Factors – the identified elemental components of organizational business models in the Life Sciences BPO Industry sector.

Results of Hypothesis testing

<table>
<thead>
<tr>
<th>SL.</th>
<th>Null Hypothesis</th>
<th>Accepted / Rejected</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>An organizations’ business performance is independent of its business model.</td>
<td>Rejected</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td>2</td>
<td>An organizations’ business performance is independent of “Customer Factor”.</td>
<td>Rejected</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td>3</td>
<td>An organizations’ business performance is independent of “Organization Factor”.</td>
<td>Rejected</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td>4</td>
<td>An organizations’ business performance is independent of “Industry/Sectoral Factor”.</td>
<td>Rejected</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td>5</td>
<td>An organizations’ business performance is independent of “Environmental Factor”.</td>
<td>Rejected</td>
<td>&lt;0.0005</td>
</tr>
</tbody>
</table>

Although no specific studies in this industry sector were identified during literature review, these results conform to research by Amit and Zott (2001), Chesbrough & Rosenbloom (2002), Martinez & Kennerley, (2005), Mausolff & Spence, (2008), Melkers and Willoughby, (2005), Osterwalder et al., (2005), Melone et al., (2006), which confirm that relationships exist between business models and business performance of organizations in general.
Comparative Study

Completion of the comparative part of the study yielded the following

1. 33 business models based on the constructed generic business model framework were identified which were specific to the Indian Life Science BPO Industry.
2. Out of these 33 business models, 21 unique, Indian Life Science BPO Industry business models were identified.
3. Organizations having a higher number of elemental CSF’s embedded in their business model perform better (on comparing and ranking organizations based on the identified business models and their predicted RTS values).
4. There is a direct and positive relation between the number of elemental CSF’s present in a business model of an organization and its business performance in the Indian Life Sciences BPO Industry. Lesser the number of elemental CSF’s in an organization, lesser is its predicted business performance value (RTS) and hence lesser is the organization capability to succeed in this industry segment.
5. There is a positive association between the predicted RTS values (based on the generic business model framework) and the factual RTS values (based on organizational financial data) of organizations exhibiting unique business models.

These finding confirm that a positive relationship exists between business model elements and business performance which is similar to finding of Amit and Zott (2001), Chesbrough and Rosenbloom (2002) and Osterwalder et al., (2005). The research of the indicated authors was in relation to other industries, sectors, segments and not specific to Life Sciences BPO Industry.

The results of this research study confirm that there is a strong, positive association between business models and business performance. This is empirically demonstrated through an association between business model predicted RTS values and factual RTS values of organizations operating in the Indian Life Sciences BPO Industry.

Study Limitations

The following limitations apply to this research:

1. This study confirms the existence of business model influence on business performance but does not help understand why this influence exists.
2. This study includes a maximum number non-financial and limited financial measures/factors in the generic business model framework.

3. The effects of different business model design frameworks have not been assessed in this research study.

4. This research did not attempt to investigate the effect of business models on all business performance measures. Additional business performance measures not studied in the current research could be investigated in future research.

5. There are a number of contextual factors that can influence a Business model and hence impact organizational performance (e.g., financial structure, leadership style etc.). This research did not seek to investigate all potential contextual factors. Additional factors not studied in the current research could be investigated in future research.

The above limitations provide an opportunity for further research to enhance knowledge in this area of management.

Contributions of this Research

The following contributions are envisaged from this research:


2. Empirical identification of different and unique business models and designs.

3. Improvement in business logic representation, design and analysis of different business models.

4. Provide a roadmap for individual firms to exploit or modify their business models to improve their performance.

5. Provide an entrepreneurial tool to improve managing businesses in a rapidly moving, complex and uncertain business environment.