Today more and more organizations are turning towards BI for making better business decisions. This is true based on the fact from the latest Gartner’s research report (Gartner Research, 2009), which states, “For the fourth year in a row, BI applications have been ranked the top technology priority in the 2009 Gartner Executive programs survey of more than 1,500 Chief Information Officers (CIOs) around the world.” BI implementations usually take very long time, consume a lot of resources and are also very expensive. They often do not bring expected results or do not fulfill vaguely defined expectations. And since turnover, is lower than in not so far past, it is more crucial to complete BI implementation with time and budget, well in order to improve business performance and to satisfy the sponsor of BI project. Thus making, the study of Critical Success Factors in BI implementation vital to study. In this project I gathered first-hand data of what industry professionals feel are critical for the implementation of Business Intelligence and then compared the results with the factors I have analyzed in my literature review to gain better understanding of the factors and also see if there is any difference in the results.
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<th>Description</th>
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<tr>
<td>BI</td>
<td>Business Intelligence</td>
</tr>
<tr>
<td>CEO</td>
<td>Chief Executive Officer</td>
</tr>
<tr>
<td>CIO</td>
<td>Chief Information Officer</td>
</tr>
<tr>
<td>CRM</td>
<td>Customer Relationship Management</td>
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<tr>
<td>CSFs</td>
<td>Critical Success Factors</td>
</tr>
<tr>
<td>DSS</td>
<td>Decision Support System</td>
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<td>DW</td>
<td>Data Warehouse</td>
</tr>
<tr>
<td>ESS</td>
<td>Executive Support System</td>
</tr>
<tr>
<td>ERP</td>
<td>Enterprise Resource Planning</td>
</tr>
<tr>
<td>ETL</td>
<td>Extract, Transform and Load</td>
</tr>
<tr>
<td>IS</td>
<td>Information System</td>
</tr>
<tr>
<td>IT</td>
<td>Information Technology</td>
</tr>
<tr>
<td>KPIs</td>
<td>Key Performance Indicators</td>
</tr>
<tr>
<td>MIS</td>
<td>Management Information System</td>
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<td>OLAP</td>
<td>Online Analytical Processing</td>
</tr>
<tr>
<td>OLTP</td>
<td>Online Transactional Processing</td>
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</table>
Declaration

I confirm that this project work has been carried out by me and this work has not been submitted for a degree or diploma in any university. This work do not contain any materials previously published by other persons except where due references are made in text. All the contributions by others, including joint publications are clearly acknowledged with due references.

Naveen K Vodapalli
November, 2009
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All good things have to come to an end sooner than later. And the accomplishments during this journey could not have been possible without support and assistance of so many people.

My foremost gratitude goes to the most instrumental person for this thesis, that is my supervisor, Asst. Prof. Frantisek Sudzina, who has been helpful to me all along right from the project proposal phase to providing contacts for the interviews, further helping out with formulation of the questionnaire followed by suggestions and corrections to this report. He has been there for me at every phase of this project.

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Many thanks to my friends Chandra, Ravi and Kiran, who have given me a helpful hand reviewing, editing and sometimes engaging in data entry for my graphical presentations.

I would like to express my gratitude to all my family members; although far from them for past few years, it is through their continued love and encouragement I have reached this stage of my life.
Dedication

To Ananya
My lovely daughter
1 INTRODUCTION

1.1 Chapter introduction

In this chapter, I would like to discuss about the project background, motivation behind taking up this project, its objective, scope and limitations of the project, overview of the methodology I have adopted during the project and the chapters alignment in this report.

1.2 Project background

Whenever turbulent times block the pathway, it is natural for any human to turn inquisitive and try to overcome the situation with deep analysis and take preventive measures in due course of time. Similarly, it is but natural that we turn inquisitive towards ongoing crisis in the business world and try to understand what constitutes towards this problem and at the same time what needs to be done to overcome this currently and may not face similar situation in future. Obviously, there have been some bad decisions made by the management of various organizations running the business. Bad decision making could be attributed to lack of information or improper utilization of the information available. In the view of above circumstances, BI could be a handy tool in the hands of management which could help the management in making better decisions by providing on the fly analysis, generation of reports and by providing predictive analysis of information available etc.

Today more and more business organizations are turning towards BI for making better business decisions. This is true based on the fact from the latest Gartner’s research report (Gartner Research, 2009), which states, “For the fourth year in a row, BI applications have been ranked the top technology priority in the 2009 Gartner Executive programs survey of more than 1,500 Chief Information Officers (CIOs) around the world.”

According to Gartner Research (June, 2009), “Worldwide Business Intelligence, Analytics and Performance Management software revenue reached $8.8 billion in 2008, a 21.7 percent increase from 2007 revenue of $7.2 billion.” Gartner maintains the forecast growth rates it previously published, BI market will show a five-year Compound Annual Growth Rate (CAGR), in revenue terms, of 8.6% from 2006 through 2011 (Gartner, 2008). As per Mr. Dan Sommer, Senior Research Analyst at Gartner, “In tough times, the first step is to increase transparency which helps identify cost-centers, and then to more tightly align strategy with
execution. This is why demand for BI, analytics and performance management is relatively strong even in a bearish economy.”

A recent Gartner report (January, 2009), also predicts the following aspects for 2009 and beyond:

- Citing lack of information, processes and tools, through 2012, more than 35 per cent of the top 5,000 global companies will regularly fail to make insightful decisions about significant changes in their business and markets.
- By 2012, business units will control at least 40 per cent of the total budget for BI.
- By 2010, 20 per cent of organizations will have an industry-specific analytic application delivered via Software as a Service (SaaS) as a standard component of their BI portfolio.
- In 2009, collaborative decision making will emerge as a new product category that combines social software with BI platform capabilities.
- By 2012, one-third of analytic applications applied to business processes will be delivered through coarse-grained application mash-ups.

Also in the same report (Gartner Research, January 2009), Nigel Rayner, research vice president of Gartner says, “Organizations will expect IT leaders in charge of BI and performance management initiatives to help transform and significantly improve their business”.

According to Online DM (2006), DataMicron Inc.,( 2008) and Business Performance Management Software (2009), “Business Intelligence means using your data assets to make better business decisions. It is about access, analysis and uncovering new opportunities”

Today, as the world is facing tougher times in the name of recession and with the world financial crisis making it even tougher for the managers to utilize their resources in a better way, the significance of BI increases heavily. This could result in temptation for business organizations and managers to implement BI within their business units or organizations.

BI implementations usually take very long time, consume a lot of resources and are also very expensive. They often do not bring expected results or do not fulfill vaguely defined expectations. And since turnover, thus available resources, is lower than in not so far past, it is more crucial to complete BI implementation with time and budget, well in order to improve business performance and to satisfy the sponsor of BI project. Thus making, the study of critical success factors in BI implementation vital to study.
1.3 Motivation for the project

I have always been inclined to know more about business side of the technological aspects especially in IT. This project has provided me a wonderful opportunity to explore both sides of the coin namely business and IT. The idea of knowing more about these two aspects, especially how they can interlink, exchange and wonderfully overlap each other’s functionalities by mutual co-operation, overall, this has been a wonderful journey.

An important motivation factor for this project has been my supervisor Asst. Professor Frantisek Sudzina who had proposed me idea of this project in our first meeting itself. He had a clear vision and planning of how to proceed with this project and along with it, full confidence in me to complete it in time. He had been a real motivation factor and inspiration behind taking up this project.

1.4 Project objective

The objective of this project is to find out the factors which are very crucial in turning any business intelligence implementation into success thus forming success criteria. These criteria thus form base of any BI implementation and when handled properly can make it successful.

1.5 Significance of the project

This project explores various aspects of BI implementation and the CSFs impacting the implementation process. This project is expected to contribute both in theory and in practice.

In theoretical terms, this project is expected to:

- Add and contribute to the already existing literature in the area of BI, in particular towards CSFs in the implementation process.
- Identify the issues and criteria which determine the success of a BI implementation.
- Examine previous literature, if any, available on CSFs of BI systems implementation and compare them with emerging CSFs obtained by first hand data available by means of interviews and thus extend significantly the literature on BI implementation.
- Validate and extend knowledge of current CSFs in BI systems.
In practical terms, this project is expected to:

- Identify the CSFs and associated contextual elements that impact on BI systems implementation, so enabling stakeholders to better use their scarce resources by focusing on those key areas that are most likely to have a greater impact (Yeoh, 2008).

### 1.6 Project scope and Limitations

The scope of this project is limited to finding out of CSFs first by literature review and later by interviews conducted within Denmark. This research does not include implementation of any kind.

During the research in my literary review section, I have consciously tried to gather the CSFs which are most recent and mostly from the corporate world. I have limited my research list with 20 authors although there could be many more available.

This project does not aim at finding of CSFs in any particular industry segment but across all industries on a whole.

Interviews for this project were conducted by meeting them personally; on limited number of people who are confined to Denmark. The participants of the interview have been contacted by searching for professionals in area of BI across the professional online network (www.LinkedIn.com) and few by references from other participants and friends.

### 1.7 Chapters alignment

It is of prime importance for anyone to present his/her ideas in a meaningful way / order. Hence here I would like to describe how I chose to place them along this report.

In chapter 1, I have discussed the project background, Scope & limitations of the project along with the project significance which give details of why I have taken up this project, the motivation behind it and the limitations to this project and what makes this project significant.

In chapter 2, I would like to give an overview of business intelligence, its evolution, definitions, architecture, components of the system, presentation of BI stack which gives full
picture of BI applications, business drivers of BI implementation, benefits of BI implementation, followed by relation between BI and Data warehousing, and then I conclude the chapter with BI implementation decision factors.

In chapter 3, here I would like to define CFS’s, what it means to organizations and then distinguish CSFs from the KPIs. Further I would present the list of CSFs I sited from my literary review followed by analysis of the listed factors.

In chapter 4, I would like to discuss in detail about the research methodology I have adopted. The issues discussed are the purpose of research, approach towards it, research strategy, selection of sample, data collection method I have adopted, analysis of data obtained followed by validity and reliability of the data gathered.

In chapter 5, I have discussed in detail about the findings of my research, its implications for organizations taking up BI project and managers followed by the conclusion. I have then discussed what could be implications of my project towards future research prospects.
**Table 1.1: Chapters Alignment**

Source: Developed for this research

<table>
<thead>
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<th>Chapter 1: Introduction</th>
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<tr>
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<td>➢ Objective of the project</td>
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<td>➢ Significance of the project</td>
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<td>➢ Project scope &amp; limitations</td>
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<tbody>
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<tr>
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<tr>
<td>➢ Key Characteristics of BI System</td>
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<td>➢ The BI Stack</td>
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<td>➢ Drivers of BI Implementation</td>
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<td>➢ BI Implementation decision factors</td>
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<td>➢ Relationship between BI and Data</td>
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<th>Chapter 3: Literature Review</th>
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<tr>
<td>➢ Definition of CSFs</td>
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<td>➢ Difference between CSFs &amp; KPIs</td>
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<tr>
<td>➢ List of CSFs</td>
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<td>➢ Categories of CSFs</td>
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<td>➢ Analysis of CSFs</td>
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<th>Chapter 4: Research Methodology</th>
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<td>➢ Research approach</td>
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<td>➢ Data collection method</td>
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<td>➢ Validity &amp; reliability</td>
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<td>➢ Implications &amp; recommendations</td>
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<tr>
<td>➢ Implications for future research</td>
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2 BUSINESS INTELLIGENCE: AN OVERVIEW

2.1 Chapter Introduction

In this chapter, I would like to give an overview of Business Intelligence, its definitions followed by discussing what constitutes a BI system, key characteristics of a BI system, importance of it with respect to business, its relation with Data Warehousing and Reporting, typical architecture of a Business Intelligence system followed by project life cycle of a Business Intelligence system.

2.2 Evolution of BI

Many in the industry believe the term “Business Intelligence” was first coined by “Howard Dresner” of Gartner Research in 1989, where he termed BI as “a broad category of software and solutions for gathering, consolidating, analyzing and providing access to data in a way that lets enterprise users make better business decisions” (Gibson et al, 2004; Yeoh, 2008). However, according to Yeoh (2008), Imhoff (2009) and Answers.com (2009), it was first coined by “H.P.Luhn” in an IBM journal titled “A Business Intelligence System” (Luhn, October, 1958). Following is the original definition of Luhn as defined in 1958, as per Yeoh (2008):

“Business is a collection of activities carried on for whatever purpose, be it science, technology, commerce, industry, law, government, defense, et cetera. The communication facility serving the conduct of a business (in the broad sense) may be referred to as an intelligence system. The notion of intelligence is also defined here, in a more general sense, as “the ability to apprehend the interrelationships of presented facts in such a way as to guide action towards a desired goal.”

However, it is widely accepted that Howard Dresner was the one to familiarize the world with the term “Business Intelligence” when he proposed BI as an umbrella term to describe “concepts and methods to improve business decision-making by using fact-based support systems.” (Answers.com, 2009)
2.3 Definition of BI

Business Intelligence or BI in short, as the name suggests corresponds to business and similar to many terms in this area, do not have a standard definition like that of many scientific terms. However, most of the BI literature has come from within the business world, the IT industry, and vendors (Jagielska et al. 2003; Yeoh, 2008).

Here are few definitions from my research:

Davenport (2007): “BI is a set of technologies and processes that use data to understand and analyze organization performance”.

Platon A/S (2009): the term BI covers “the use of information to drive business insight. Basically it’s about providing a better foundation for decision makers by providing information in the right form, in the right quality, at the right time”

Elizabeth Vitt et al. (2002): the term BI is “used by different pundits and software vendors to characterize a broad range of technologies, software platform, specific applications, and processes”. Thus it is clear that many people have viewed or expressed BI differently and from various contexts.

Also during my research, respondents have defined the term BI different from each other. The following are the definitions given by them.

According to Respondent2, “BI is a tool for monitoring of business activities and it usually produces better results when integrated with the business model”.

Respondent1 views it as “data created for the end users for the purpose of their needs” and for him the data generated is of primary concern rather than how we are generating it, aka data is of primary importance rather than the applications or tools used for generation of it.

As per Respondent3, BI is “provisioning of decision worthy information in proper context, time and quality”.

Respondent4 views BI as “a means to provide business information for end-users and decision makers of the organization” and opines that “it is business driven rather than technology driven”.
Following are few definitions rendered by various business vendors and authors with respect to BI:

**Table 2.1: Summary of varied BI definitions**

Source: Adopted from Yeoh (2008)

<table>
<thead>
<tr>
<th>BI Vendor / Author</th>
<th>Definition of BI</th>
</tr>
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<tbody>
<tr>
<td>Turban <em>et al</em> (2007)</td>
<td>An umbrella term that encompasses tools, architectures, databases, data warehouses, performance management, methodologies, and so forth, all of which are integrated into a unified software suite.</td>
</tr>
<tr>
<td>Moss &amp; Atre (2003)</td>
<td>It is an architecture and a collection of integrated operational as well as decision-support applications and databases that provide the business community easy access to business data.</td>
</tr>
<tr>
<td>Chang (2006)</td>
<td>The accurate, timely, critical data, information and knowledge that supports strategic and operational decision making and risk assessment in uncertain and dynamic business environments. The source of the data, information and knowledge are both internal organizationally collected as well as externally supplied by partners, customers or third parties as a result of their own choice.</td>
</tr>
<tr>
<td>Gangadharan &amp; Swami (2004)</td>
<td>The result of in-depth analysis of detailed business data, including database and application technologies, as well as analysis practice.</td>
</tr>
<tr>
<td>Kulkarni &amp; King (1997)</td>
<td>A product of analyzing business data using business intelligence tools. It emerges as a result of this analysis.</td>
</tr>
<tr>
<td>Moss, L &amp; Hoberman S (2004)</td>
<td>The processes, technologies, and tools needed to turn data into information, information into knowledge and knowledge into plans that drive profitable business action. BI encompasses data warehousing, business analytics tools and content/knowledge management.</td>
</tr>
<tr>
<td>Adelman &amp; Moss (2000)</td>
<td>A term encompasses a broad range of analytical software and solutions for gathering, consolidating, analyzing and providing access to information in a way that is supposed to let an enterprise’s users make better business decision.</td>
</tr>
<tr>
<td>Gartner Research (Hostmann,</td>
<td>An umbrella term that includes the analytic applications,</td>
</tr>
<tr>
<td>Year</td>
<td>Company/Source</td>
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<td>-------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>2007</td>
<td></td>
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<td></td>
<td>IBM (Whitehorn &amp; Whitehorn, 1999)</td>
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<td></td>
<td>Business Objects (2007)</td>
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<td></td>
<td>Cognos (2007)</td>
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<td>SAS Institute (Ing, 2007)</td>
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<td></td>
<td>Oracle (2007)</td>
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<td></td>
<td>Informatica, Teradata, MicroStrategy (Markarian et al 2007)</td>
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### 2.4 BI System

According to Olszak & Ziemba (2007), Business Intelligence Systems provide a proposal that faces needs of contemporary organizations. Main tasks that are to be faced by the BI systems include intelligent exploration, integration, aggregation and a multidimensional analysis of data originating from various information resources. Systems of a BI standard combine data from internal information systems of an organization and they integrate data coming from the particular environment e.g. statistics, financial and investment portals and miscellaneous databases. Such systems are meant to provide adequate and reliable up-to-date information on different aspects of enterprise activities.
As per NAV (2007), BI system when implemented gives the ability to access, use and share data and information in an efficient and relevant way helps improve business performance. Business intelligence capabilities empower employees to:

- Align day-to-day operations with overall company strategy and objectives
- Identify and understand the relationship between business processes and their impact on performance
- Access information relevant to specific user roles and responsibilities
- Analyze data from documents and spreadsheets in an easy way
- Gain contextual insight into business drivers
- Monitor the vital business indicators that are needed to move an organization forward such as:
  - Current status and trend of essential financial ratios
  - Effectiveness and profitability of sales channels
  - Crucial operational metrics.

In short, business intelligence helps companies gain a comprehensive and integrated view of their business and facilitate better and more effective decision-making (NAV, 2007).

### 2.5 BI Architecture

As per David Loshin (2008), the objective of the business information analysis was, and still is, the ability to evaluate how efficiently the organization operates and subsequently seek out opportunities for exploiting actionable knowledge. This notion of performance management and improvement through reporting and analytics has evolved into what is commonly referred to as “business intelligence.” While many front-end presentation, reporting, and visualization products help in communicating the results of this analysis, business intelligence remains inextricably linked to the technical infrastructure of the data warehouse.

The tactical challenges for providing a framework for business intelligence involve collecting data from disparate distributed systems, consolidating that data into a centralized model, and organizing the data to feed the front-end applications for driving business analysis and reporting. As is seen in Figure 2.1, this requires data connectors to extract data from the sources, integration tools to assimilate and consolidate the data, servers and storage used to house the data warehouse and its database management system, all feeding the front-end application architecture for reporting, dashboards, data mining, and dimensional analysis (David Loshin, 2008).
Figure 2.1: Traditional BI Architecture

Source: Adopted from David Loshin (2008)

However the traditional architecture could also be illustrated with its designated technological components presented in the following Figure 2.2.
2.5.1 Components of BI Architecture

The components of the above technical architecture are described as follows (kJube, 2002):

1. **Source systems:** It consists of all the data that an organization might require for the analysis. It may consists of data from a source database, external data feeds from the partners in XML format, data from the click-stream analysis captured from the organizational website based on customer behavior, a connection from application server level ERP connection, data from Excel files and many more sources. (kJube, 2002).

2. **ETL tools:** ETL is a process to extract data, mostly from different types of system, transform it into a structure that’s more appropriate for reporting and analysis and finally load it into the database. The following Figure displays the steps involved in the process:
3. **Data Quality:** According to Passionned Nederland B.V (2009), today ETL does much more than what it is known for. It also covers data profiling, data quality control, monitoring and cleansing, real-time and on-demand data integration in Service Oriented Architecture (SOA), and Metadata Management.

4. **Data mining:** As per Kurt Thearling (2009), Data mining, the extraction of hidden predictive information from large databases, is a powerful new technology with great potential to help companies focus on the most important information in their data warehouses. Data mining tools predict future trends and behaviors, allowing businesses to make proactive, knowledge-driven decisions. The automated, prospective analyses offered by data mining move beyond the analyses of past events provided by retrospective tools typical of decision support systems. Data mining tools can answer business questions that traditionally consuming a lot of time to resolve.

5. **Data staging:** In the data warehousing process, the data staging area is composed of the data staging server application and the data store archive (repository) of the results of extraction, transformation and loading activity. The data staging application server temporarily stores and transforms data extracted from OLTP\(^1\) (Online Transaction Processing) data sources and the archival repository stores cleaned, transformed

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\(^1\) Online Transaction Processing is a class of program that facilitates and manages transaction-oriented applications, typically for data entry and retrieval transactions in a number of industries (SearchDataCenter.com, 2009).
records and attributes for later loading into data marts and data warehouses (Firestone, 2002).

6. **Operational Data Store (ODS):** According to Inmon (1998), an ODS is an integrated, subject-oriented, volatile (including update), current-valued structure designed to serve operational users as they do high performance integrated processing. The essence of an ODS is the enablement of integrated, collective on-line processing. An ODS delivers consistent high transaction performance – two to three seconds. An ODS supports on-line update. An ODS is integrated across many applications. An ODS provides foundation for collective, up-to-the-second views of the enterprise. And, at the same time, the ODS supports decision support processing.

7. **Multi-dimensional data warehouse:** As per kJube (2002), the multi-dimensional data warehouse is the core of the business intelligence environment. Basically it is a large database containing all the data needed for performance management. The modeling techniques used to build up this database are crucial for the functioning of the BI solution. Typical characteristics of multi-dimensional data warehouse are that it contains invariant, integrated, and atomic data. A good understanding of multi-dimensional modeling techniques is necessary for better understanding of such data warehouse.

8. **Data mart:** A data mart is a smaller version of a data warehouse, typically containing data related to one functional area of the firm or with limited scope in some other way. It can be a useful step to a full-scale data warehouse (Rai & Storey, 2001).

9. **OLAP:** According to Rai & Storey (2001), Online Analytical Processing or OLAP as it is popularly known, is a technology for real-time ad-hoc data access and analysis. It is a vendor-driven solution to meet business needs. The OLAP software may require scheduling, queuing, monitoring capabilities to handle thousands of users.

10. **Semantic layer:** According to Vezzosi (2009), Semantic layer reduces time to Business Intelligence. It provides a secured access to data with simple business terms. It can open access to any client and user, data type. It can combine with Data Federation for more agility. Semantic layers acts as an intermediary between presentation layer, which normally is the user interface for all end-users, business analysts, and administrators and the data storage area.

11. **Single point of information access:** As a BI solution can generate various types of outputs such as reports, dashboards, scorecards etc. These outputs may sometimes contain tags, comments, interpretations etc which is in multiple forms and needs to be stored in a storage location which can be attached to these reports and hence may consume huge amounts of data storage space. So it is often advisable to have a single point of access through a portal solution, where it is also possible to attach a business user, scope of the report along with accessibility options (kJube, 2002).
2.6 Key Characteristics of a BI System

Characteristics in general refer to features of a particular entity. Key characteristics of a BI system here refer to the advantages that can be reaped when a BI system is implemented. As per Dr. Saadia Asif (2009), the following are the key characteristics of a BI System:

- Integrated data from multiple sources
- Consistent data across organizational systems
- Cleansed current and historical data
- Data analyzed across dimensions and hierarchies
- Fast delivery of analysis

2.7 The BI Stack

More often than not during my research, I have met BI consultants and managers frowning and fretting over about their colleagues when it is interchangeably used with Reporting and Data warehousing. “Reporting and analytics – or the so-called ‘presentation’ layer of BI – is just a small part of the BI architectural stack” (Evelson, 2008). The following figure presents the Business Intelligence Stack:
2.8 Drivers of BI Implementation

Gone are the days when key decision makers in the business organizations used to rely mainly on their instincts or gut-feelings to take important decisions. Business Intelligence has
now started to emerge and “is playing a key role in business decisions by providing proven solutions to help leverage best business practices to deliver the timely granular intelligence needed to create increasingly effective business strategies, continuously strengthen competitive positions, and steadily improve revenue streams” (Peter Callaghan, 2005).

“BI has a reputation for being a resource sink that delivers reports almost no one reads. It doesn’t have to be that way. And you can no longer afford to let it be” (Gruman, 2007).

Gruman also says, by treating BI as a set of technologies, most organizations veer off track, building ever-more-complex systems that fail to meet user needs – while what’s really needed is a better understanding of the underlying data and business requirements.

As per Gruman (2007), Business drives BI:

- At 74% of companies, management is driving BI as a key priority. Of these, 48% are driven by the executive level and 30% by line-of-business management.
- 74% of companies see BI as having high or critical priority in three to five years – and 66% in the coming year.
- 61% of respondents say business analysts are playing a more strategic role in their organizations. 39% of these organizations plan to hire more business analysts in the next year.

Gruman (2007) also mentions of How BI is used:

- Predictive analytics is a big use of BI, with 62% of respondents using it this way or planning to within a year. Sales (56%), finance (54%), marketing (54%), logistics/materials management (35%), and customer service/call center (35%) departments use predictive analysis the most.
- The most important BI capabilities are drill-down and drill-through (67%), sorting and filtering (60%), and decision evaluation and optimization (45%).
- 36% of respondents are extremely or very confident in the relevance and accuracy of reports and dashboards. 10% have no confidence in them.
- 54% of respondents would consider replacing BI-generated reports with search technology that lets users get their own results. But 43% of those respondents say their companies don’t have the internal expertise to do so.

Why the business world is so obsessed with BI and what are the driving forces of it, for whom is it useful and for what purposes is well illustrated with the following Figure2.5:
As per NAV (2007), BI helps drive businesses to better performance by enabling all decision makers – essentially empowering all employees throughout the organization – to make better decisions. There are 3 kinds of decisions that an organization makes:

- **Strategic decisions** – these are the “big” decisions that companies make (e.g. should we buy a partner, should we enter a new market). The value of these decisions is large – but the quantity is few.
- **Tactical decisions** – this has been where business intelligence traditionally has been implemented. This is the product manager deciding what discount schedule to put in place or a pricing decision for a new product.
- **Operational decisions** – these are the business decisions (often made by people that have never heard of “business intelligence”) that happen a lot on a daily basis – yet, they have smaller business impact when measured by themselves. However, in aggregate, multiple operational decisions add up to a lot of value – and can drive a better business.
As per Platon A/S (2009), the real drivers for an organization to take up implementation of a BI system should be business initiatives or legal requirements rather than the technology or IT initiatives. BI implementation must be carried out in close co-operation with the business areas. The following figure 2.6 illustrates the business value of BI against cost and time:

Figure 2.6: BI Value Chain against Cost and Time

Source: Adopted from Platon A/S (2009)

Figure 2.7 illustrates the value chain of the BI system across various levels of decision making across the organization, the type of managers or decision makers involved, along with the characteristics of data at that level.
According to Platon A/S (2009), the value chain of business intelligence lies where data, which represents facts about events, transforms into information, which makes you able to react on the events and then into knowledge, which makes it possible to proactively carry out actions on events.

2.9 BI Implementation decision factors

There are number of factors which might affect decision making process while taking up of a BI project. Given below are the categorized lists of factors that affect the decision making process followed by the aspects that need to be pondered upon:

Source: Adopted from Dr. Saadia Asif (2009),

1. Reporting and Analysis Tools:
   a. Features and functionality
   b. Scalability and deployability
   c. Usability and manageability
   d. Ability to customize
2. Databases:
   a. Scalability and performance
   b. Manageability and availability
   c. Security and customization
   d. Ability to Write back

3. ETL Tools
   a. Ability to read any source
   b. Efficiency and productivity
   c. Cross platform support

4. Costs involved
   a. Hardware costs (actual or opportunity)
   b. Costs of software (ETL, databases, applications and front-end)
   c. Internal development costs
   d. External developments costs
   e. Internal training
   f. Ongoing maintenance

5. Benefits
   a. Time savings and operational efficiencies
   b. Lower cost of operations
   c. Improved customer service and satisfaction
   d. Improved operational and strategic decision making
   e. Improved employee communications and satisfaction
   f. Improved knowledge sharing

2.10 Relationship between BI and Data warehouse

More often than not, it has been observed that people interchangeably use the word BI with that of an Data warehouse. Let us now examine the relation between these two terms.

According to Platon A/S (2009), the term Data warehouse covers the management of data as opposed to the term Business Intelligence that focus on the usage of data. The purpose of data warehousing is to provide integrated, consistent, structured, correct and timely data for any system or user that requires information. Data is extracted from operational systems and integrated in the data warehouse environment in order to provide an enterprise wide perspective, one version of the truth. Whereas, the term business intelligence covers the use of information to drive business insight. Basically it’s about providing a better foundation for
decision makers by providing information in the right form, in the right quality and at the right time.

As per Dr. Saadia Asif (2009), “BI is used for exploitation of data where as Data warehouse is used for integration of the data” and hence it is understandable that they cannot be used interchangeably.

The following are the views expressed by Moss et al (2003):

According to Larissa Moss, BI refers to the capability of providing a 360° view of the business and is a framework of cross-organizational disciplines and an enterprise architecture for the construction and management of an integrated pool of operational as well as decision support applications and databases that provides the business community easy access to their business data and allows them to make accurate business decisions. One vehicle to delivery business intelligence is data warehousing; another vehicle is CRM and so on. In other words, data warehousing is a subcomponent of and a vehicle of delivering business intelligence.

As per Adrienne Tannenbaum, BI refers to the use of existing data / information / knowledge within an enterprise. In general, most data is currently diverse and sporadically integrated (such as with a single data warehouse). In a BI framework, all of this is looked at as part of a bigger whole and becomes available via one search. Documentation, business rules, search criteria and existing reports are examples of things that are accessible from one place, typically via organized and related search terms.

As per Scott Howard, BI refers to systems and technologies that provide the business with the means for decision-makers to extract personalized meaningful information about their business and industry, not typically available from internal systems alone. This includes advanced decision support tools and back-room systems and databases to support those tools. The data warehouse is that back-room database. Combine that with the support tools required to build and maintain the data warehouse, such as data cleansing and extract, transform and load tools and you have what many call data warehousing.

Think of the data warehouse as the back office and business intelligence as the entire business including the back office. The business needs the back office on which to function, but the back office without a business to support, makes no sense.

Chuck Kelley feels, you build a data warehouse to put a tool on top of it to do business intelligence. So data warehousing is the foundation that business intelligence is built upon.
Clay Rehm feels, the data warehousing stemmed from the terms ‘decision support’ and ‘management reporting’ many years ago. BI sought to encapsulate more processes that include data warehousing. If you notice, many vendors use the term BI to describe their services; to show that they provide more services than just data warehousing.

2.11 Benefits of BI Implementation

As per Dr. Saadia Asif (2009), implementation of a BI system can offer:

1. Enhanced Revenue
   - Through new customer acquisitions
   - Cross selling and up selling to existing customers

2. Reduced operating costs
   - Reallocate resources to low cost channels
   - Lower operating costs
   - Enhance product offerings and improve customer service

3. Competitive advantage
   - Greater share of customers mind and wallet by identification of key customer needs and service opportunities.

According to Schiff (2009), implementing a BI system in an organization also helps:

- Improve the overall efficiency and effectiveness of your organization
- Help organization make better decisions – by provision of customized applications or tools aimed at users of various cadres.
- Allow business users to analyze and better understand their organization’s plans and results.
- Alert organizations to potential issues when exceptional conditions occur – such as sales dropping 20% below forecast or inventory falling below a threshold value.
3 LITERATURE REVIEW

3.1 Chapter Introduction

In this chapter, I would like to discuss what constitutes the CSFs, how to distinguish them from the KPIs. Further I would like to list all the CSFs I have cited in various articles, reports, executive white papers etc then categorize them into different perspectives and analyze them accordingly and present graphical representation of the analysis.

3.2 Critical Success Factors

Certain areas need to perform at satisfactory levels for a system or organization to run successfully in competitive conditions. These areas thus become important ingredients of a successful system and hence called Critical Success Factors. Most importantly these factors are not measurable.

According to Rockart (1979), CSFs are the limited number of areas in which satisfactory results will ensure successful competitive performance for the individual, department or organization. CSFs are the few areas where “things must go right” for the business to flourish and for a manager’s goals to be attained.

CSFs are the characteristics, conditions or variables that can significantly impact on the success of a firm competing in particular industry given that the variables, conditions and characteristics are well sustained, maintained or managed (Leidecker & Bruno, 1987) and identifying them can help to clarify the nature and scope of resources that must be gathered to permit the project team to concentrate its efforts on priority issues rather than wasting time considering what the available technologies will allow (Greene & Loughridge, 1996). A set of CSFs identified for the development of any major information system, such as a BI system, is fundamentally different from the set of interlinked detailed tasks which must be accompanied to ensure a project’s completion (Dobbins, 2000; Yeoh, 2008). Hence, a mere ensuring of successful execution of CSFs may not guarantee success of a project implementation but surely it can give a prolonged run to the project.
3.3 Distinguishing CSFs from KPIs

KPIs or Key Performance Indicators usually are a measurement of progress towards achieving goals of a project-in-hand, system or organization. KPIs allow management to take quick actions when there are well defined performance indicators in place all along the way in achieving organizational or project goals.

According to Cooper (2006), KPIs represent a particular value or characteristic that is measured to assess whether an organization’s goals are being achieved. They reflect the critical success factors, stakeholder needs, and the expectations of the organization. For KPIs and their measures to be effective, the organizations’s goals need to be specific, measurable, agreed, realistic and time-based. KPI’s can use both financial and non-financial metrics. According to him, KPIs need to be specific, measurable, realistic and time based.

Cooper (2006) also believes KPI’s are used in conjunction with CSF’s and must have a target that is to be achieved. The target for a KPI can be expressed as a percentage, a simple ratio, an index, a composite average or in a statistical context. Whatever is chosen as a KPI and a target must be actually measurable. At the outset, keeping the number of KPI’s for a single CSF in the range of 3-5 is recommended.

Hence in a broader picture, KPI’s can be part of CSF’s but not in vice versa.

3.4 List of CSFs

As a part of my research, I have extensively searched for the CSFs with respect to implementation of BI as mentioned by various authors in various articles, journals, periodicals, reports, and executive white papers etc. Here, I have hence decided to list them in Table 3.1 along with the authors. Some of the CSFs might be overlapping in the list hence I would like to further utilize the space in analysing the CSFs.

<table>
<thead>
<tr>
<th>Source: Developed for this research</th>
</tr>
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<tbody>
<tr>
<td>1. Claudia Imhoff, President, Intelligent Solutions (Claudia Imhoff, 2004)</td>
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<td>Number</td>
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</tbody>
</table>
| 2. | Ferenc Mantfeld, CTO, Siebel (Mantfeld, 2006) | | As per Ferenc, BI Implementations **fail** because of the following reasons:  
  - Lack of upfront Planning  
  - Data Quality Issues  
  - Not Anticipating Change  
  - Differences in Perceived need  
  - One-Stop Shopping  
  - Dashboards as a generic cure  
  - Outsourcing  
  - Performance Considerations |
  - Support all users via integrated BI suites  
  - Conforms to the way users work  
  - Integrates with Desktop and operational applications  
  - Delivers actionable information  
  - Foster rapid development  
  - Provide a robust, extensible platform |
| 4. | Cindi Howson, Founder of BIScorecard (Howson, 2006) | |  
  - Measure Success  
  - Develop a data strategy  
  - Manage the program well  
  - Ensure executive support  
  - Choose appropriate tools  
  - Standardize on a platform  
  - Align BI strategy with business |
| 5. | Keith Gile, Senior Industry Analyst, Forrester Research (Gile, 2003) | |  
  - Create a formal plan  
  - Classify analytic end users / Know the users (Producers and Consumers)  
  - Map the solutions to the users (Determine what you already have and fill in the gaps) |
| 6. | Dan Murray, VP & CIO of Blastrac Manufacturing (Dan Murray, 2009) | |  
  - Define the problem clearly – avoid scope creep  
  - Identify user’s specific issues and needs – solve their problems  
  - Understand the underlying data issues – BI is not just software  
  - Select the appropriate toolset – look for fast, easy, lightweight and low cost application  
  - Build for flexibility and responsiveness – know that users will require changes early on  
  - Leverage existing staff – eliminate solutions that require new staff and/or consultants  
  - Lead from the top – leverage your authority and executive buy-in |
| 7. | Ilya Dmitriev, Head of BI and Geospatial department, Affecto | |  
  - Common language (“Rosetta stone”)  
  - Less is more  
  - Balance approach  
  - Manage organizational resistance  
  - Resource planning |
<table>
<thead>
<tr>
<th>Reference</th>
<th>Author(s)</th>
<th>Key Points</th>
</tr>
</thead>
</table>
- Application model: Active involvement for all stakeholders  
- Data model: Operational data store and unstructured data |
| 9. William Yeoh, Andy Koronios, Jing Gao (Yeoh et al, 2008) | - Committed management support & sponsorship  
- Business user-oriented change management  
- Clear business vision & well established case  
- Business driven methodology & project management  
- Business centric championship & balanced project team composition  
- Strategic & extensible technical framework  
- Sustainable data quality & governance framework |
| 10. U.S. Army Enterprise Solutions Competency Center (ESCC, 2009) | - High level executive, financial, and IT involvement  
- Engaged end users  
- Business and IT alignment  
- Pervasive appreciation for value of data throughout the enterprise  
- Implement five key BI best practices  
  1) Business Information governance programs  
  2) Enterprise information strategy  
  3) Information quality program  
  4) Enterprise data warehouse  
  5) Organizational competency center  
- Ensure Clean and High quality data relevant to the business  
- Define clear role to the Competency center for BI success which includes ‘champion the BI technologies and define standards. It focuses on business-alignment, project prioritization, and resolving management and skills issues associated with significant BI projects’  
- Have a continuous improvement mentality in order to realize and achieve the full business value of having a BI solution. |
- Realistic Expectations  
- Methodology*  
- Team*  
- Proper Technical Architecture and tools*  
- Quality data*  
- Limited Scope Changes  
- Fast payback projects  
*Note: Key areas where DW/ETL tools and BI consultants can add value. |
| 12. Steve Williams & Nancy Williams, Elsevier, Inc. | According to them common mistakes that are made while establishing and managing BI program are  
- Using ad hoc practices to select and fund BI projects  
- Having a continuous improvement mentality in order to realize and achieve the full business value of having a BI solution. |
<table>
<thead>
<tr>
<th>Reference</th>
<th>BI Pitfalls to watch for:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Williams &amp; Williams, 2007)</td>
<td>• Providing inadequate governance for the BI program management</td>
</tr>
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<td></td>
<td>• Establishing de facto program governance based on the initial BI project</td>
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<td></td>
<td>• Failing to strategically position BI in the business organization</td>
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<td></td>
<td>• Not providing adequate resources and funding for supporting efforts needed for a successful BI initiative</td>
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<tr>
<td>13James Markarian, CTO, Informatica; Stephen Brobst, CTO, Teradata; and Jeff Bedell, CTO, MicroStrategy in a joint whitepaper (Markarian et al, 2007)</td>
<td>• Data freshness, cleansing, accuracy and completeness</td>
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<td></td>
<td>• Scalability in terms of concurrent users by delivery mechanism</td>
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<tr>
<td></td>
<td>• Mixed workload management to ensure service level performance goals</td>
</tr>
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<td></td>
<td>• Tactical query response time measures by type of user and analytic</td>
</tr>
<tr>
<td></td>
<td>• High availability metrics by user community</td>
</tr>
<tr>
<td>14. Neil McMurchy of Gartner Research (Neil McMurchy, 2008)</td>
<td>• A strategic view of BI with a phased implementation, focused on benefit realization</td>
</tr>
<tr>
<td></td>
<td>• Strong business ownership of the BI strategy and its outcomes</td>
</tr>
<tr>
<td></td>
<td>• Fixing data quality and data governance issues early in the process</td>
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<td></td>
<td>• Constantly seeking to expand the scope of the BI strategy</td>
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<td></td>
<td>• Substantial and sustained investment in BI skills and competencies</td>
</tr>
<tr>
<td>15. Lyndsay Wise (Wise, 2007)</td>
<td>• Identifying the Business Problem</td>
</tr>
<tr>
<td></td>
<td>• Determining the Expectations of Use</td>
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<td></td>
<td>• Understanding Delivery of Data</td>
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<td></td>
<td>• Rolling Out of Training Initiatives</td>
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<tr>
<td></td>
<td>• Choosing a Vertical – or Horizontal based Solution</td>
</tr>
<tr>
<td>16. Knightsbridge in partnership with BusinessWeek Research Services (Knightsbridge, 2006)</td>
<td>• Business Information governance programs</td>
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<tr>
<td></td>
<td>• Enterprise information strategy</td>
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<td></td>
<td>• Information quality programs</td>
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<td></td>
<td>• Enterprise data warehouse</td>
</tr>
<tr>
<td></td>
<td>• BI Competency centers</td>
</tr>
<tr>
<td>17. Dan Vesset, in</td>
<td>• Defining system requirements</td>
</tr>
<tr>
<td></td>
<td>• Transforming disparate data into a single model</td>
</tr>
</tbody>
</table>
| Keys to Successful Business Intelligence Deployment for IDC, commissioned by Oracle and titled “The State of Business Analytics - Best Practices, Benefits, Challenges and Shortcomings” (Vesset, 2005) | • Managing user expectation/experience  
• Guaranteeing system availability |
|---|---|
| 18. Anthony Mano, CEO, Lisys Technology Solutions (Mano, 2009) | • Business requirements: should meet Consistency, Completeness, Clarity and Compliance  
• Business data: Accessibility, Completeness and Quality are foundations of successful implementation.  
• Technology: should complement existing systems; available at an affordable cost; provide rapid development; adaptable and flexible for custom development; control for change and meta-data management  
• Expertise: know-how, aptitude and attitude makeup an expert technical resource. |
• Identifying key requirements and validating the proof of concept  
• Evaluating the quality and sufficiency of source data  
• Insuring flexibility in the final implementation  
Steps to insure BI implementation success  
• Think big, start small  
• Use iterative prototyping techniques in defining requirements and scope |
| 20. John Schwechel, Senior Project Manager with Retail Process Engineering, LLC. (Schwechel, 2005) | • Set expectations: Define the project  
• Get organized: Create the project plan  
• Start at the top: Gain executive support  
• The best teams deliver the best results: Project team management  
• Prepare for the inevitable: Risk management  
• Stick to the plan: Scope management  
• Deliver on the plan: Quality assurance  
• Spread the news: Communicate early and often  
• Gain user acceptance: Change management  
• Quantify results: Measure project success |
3.5 Categorization of CSFs:

According to Yeoh, 2008, CSFs can be broadly classified into 4 categories namely Organizational, Process, Technical and Environmental dimensions or perspectives. But during my study of these CSFs, Environmental perspective is deemed unfit for this research as none of the factors listed above in Table 3.1 refer to this perspective. The factors that could be considered in each perspective could be better illustrated with the following Figure 3.1.

![Figure 3.1: Grouping critical perspectives of CSFs](source: Adopted from Yeoh, 2008)
Based on the Figure 3.1, I have categorized all the CSFs listed in Table 3.1 according to respective perspectives and arrived at Table 3.2 as a result. Thus, Table 3.2 would now represent all the CSFs listed in Table 3.1.

### Table 3.2: Categorization of CSFs

Source: Developed for this research

<table>
<thead>
<tr>
<th>Organization Perspective</th>
<th>Process Perspective</th>
<th>Technology Perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Committed management support and sponsorship</td>
<td>6. Usage of iterative prototyping to define requirements &amp; scope</td>
<td>12. Data quality &amp; management issues</td>
</tr>
<tr>
<td></td>
<td>9. User training &amp; support</td>
<td>15. Performance considerations</td>
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<td></td>
<td>10. Change management</td>
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</table>

### 3.6 Analysis of CSFs from the literature review

For analysis of the listed CSFs I have tabulated the CSF variables according to respective perspectives and further, the factors listed by various authors are marked accordingly in Table 3.3.
### Table 3.3: Analysis of CSFs from the literature review

Source: Developed for this research

<table>
<thead>
<tr>
<th>Authors</th>
<th>Organization Perspective</th>
<th>Process Perspective</th>
<th>Technical Perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Claudia Imhoff (2004)</td>
<td>*</td>
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<td>*</td>
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<tr>
<td>Mantfeld (2006)</td>
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<td>Eckerson (2005)</td>
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<td>Howson (2006)</td>
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<td>Gile (2003)</td>
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<td>Dan Murray, (2009)</td>
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<td>Dmitriev (2008)</td>
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<td>InetSoft Technology (2007)</td>
<td>*</td>
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<td>*</td>
</tr>
<tr>
<td>Yeoh et al (2008)</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>ESCC (2009)</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>deHenry (2009)</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Williams &amp; Williams (2007)</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Markarian et al, (2007)</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Neil McMurchy (2008)</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Wise (2007)</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Knightsbridge (2006)</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Vesset (2005)</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Mano (2009)</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Meister (2009)</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Schwechel (2005)</td>
<td>*</td>
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<td>*</td>
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<td><strong>5</strong></td>
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<td><strong>11</strong></td>
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<tr>
<td></td>
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</tr>
<tr>
<td></td>
<td><strong>2</strong></td>
<td><strong>14</strong></td>
<td><strong>5</strong></td>
</tr>
</tbody>
</table>
Analysis of CSFs:

From the figure 3.2 it can be read that higher the bar length of the CSF, the higher priority to be given to the CSF while implementation.

Based on the analysis, given below is the list of CSFs in the order of priority:

**Table 3.4: Priority order of CSFs from the Literature Review**

<table>
<thead>
<tr>
<th>Priority Order</th>
<th>CSF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Clear vision &amp; planning</td>
</tr>
<tr>
<td>2</td>
<td>Data quality &amp; management issues</td>
</tr>
<tr>
<td>3</td>
<td>Map the solutions to the users</td>
</tr>
<tr>
<td>4</td>
<td>Committed management support and sponsorship</td>
</tr>
<tr>
<td>5</td>
<td>Performance considerations</td>
</tr>
</tbody>
</table>
|   | Balanced team composition  
|   | Robust & extensible framework  
| 7 | Partnership between Business Community & IT  
|   | Information governance via BI competency center  
|   | Business driven methodology & Project management  
|   | Usage of iterative prototyping to define requirements & scope  
|   | User training & support  
|   | Change management  
|   | Appropriate technology / tools  
| 8 | Integrated BI applications  |


4 RESEARCH METHODOLOGY

4.1 Chapter Introduction

In this chapter, I would like to give an idea about the research process on whole, reasons behind the research, approach process adopted and the reasons behind it, sample selection and my approach towards them, problems faced during the process followed by data analysis. Overall, this chapter would give an impression of reliability and validity of both approach and the data.

4.2 Research Purpose

According to Yin (2003, as cited by Kalbasi, 2007), the purpose of an academic study can be exploratory, descriptive or explanatory.

- Exploratory studies are practical if you wish to clarify your understanding of a problem (Saunders et al, 2000, as cited by Kalbasi, 2007). Exploratory studies are a method of finding out “what is happening; to seek new insights; to ask questions and to assess phenomena in a new light” (Robson, 1993 as cited by Saunders et al, 2000 and Kalbasi, 2007).

- Descriptive studies are appropriate when you wish to portray phenomenon such as events, situations or process. Furthermore, a descriptive study is also appropriate when a problem is clearly structured, but the intention is not to conduct research about the connections between causes and symptoms (Kalbasi, 2007).

- Explanatory studies are useful when you wish to establish casual relationship between variables. The emphasis in this sort of study is to examine a situation or a problem in order to explain the relationship between variables (Saunders et al, 2000 as cited by Kalbasi, 2007).

My research work here is exploratory as I wish to verify and validate the results obtained on analysis of CSFs in my literature review. In the process of achieving the overall objective of the project, I have already gone through various literatures and have done analysis of the CSFs of the BI implementation process in chapter 3. The purpose of this research is to give me better understanding of the quality of data I have gained and analyzed, context of it and relevance to the current project.
4.3 Research Approach

My approach towards this research has been mostly qualitative rather than quantitative. I have contacted as many professionals as possible and conducted personal interviews based on the questionnaire presented in Appendix 1. I have chosen interview method as the research methodology for this project because that would assure me that the data obtained is of highest quality and is first-hand. That would also give me valuable insights into how the BI industry is functioning in Denmark and at the same time get an impression of prospective employers. But due to many constraints (time, finance, availability of respondents etc) conducting interviews for all people was not feasible; also if we approach survey method there can be serious ambiguities about the quality of data obtained. Hence, I have decided to take interviews of a limited number of people for this research purpose.

4.4 Research Strategy

The data generated by the interview process would then be analyzed and the output would then be compared with the results obtained from the literature review to find if there are any differences in outputs generated by this research and the literature review.

4.5 Sample Selection

Sample selection for this research has been randomly identified by searching on professional networking website www.LinkedIn.com and requests for interviews has been sent to people after going through their profiles and on confirming that their current work location is in Denmark. Out of six to seven requests sent randomly through the LinkedIn network only two responded positively and hence I had to look for other contacts. I had then communicated with Human Resource departments of few consulting companies and other organizations referred by my friends. During the interview process I had two respondents who were helpful, by providing one reference each for the interviews. For a long time I was held up at six interviews in total, then fortunately during the last 2 weeks, I got a positive response from one person who was referred by a respondent and the interview took place on last working day before submission of this project. That made the total number of interviews taken for this research seven.
4.6 Data Collection Method

Although Time-consuming, overall interview process for this research has been very satisfactory. All the interviews were taken by meeting the respondents personally at their office locations. The questionnaire for the first two interviews had only 19 questions, questions 20 and 21 were added later to the list considering they would be more helpful in analysis of the results. The first two respondents were contacted again and informed about addition of two more questions, the additional questions were then sent to both respondents one and two by email and they have replied back with answers at a later stage according to their convenience. Respondent2 has wished to give same priority level to some of the factors and hence have answered them accordingly. The emailed answers were then added to rest of their answers in the questionnaire.

4.7 Data Analysis

Analysis of the data recorded during the interviews could be used to understand the CSFs better and to analyze if there are any differences generated from this output to that of results obtained from the literature review.

Here are some facts about the interviews taken for this research:

- Although, I tried to have as many interviews as possible. I could only manage total 7 interviews for this research.
- Only 2 respondents have responded positively when asked whether I could mention their name and the organization they are working. 3 other respondents had no issues mentioning their name in this report but for some reasons did not wish to relate their views with the organization they are working for, hence wanted me to keep their company name anonymous. 2 respondents wanted to keep both the details as anonymous.
- Average experience of the respondents in IT industry was 14 years. The minimum experience level recorded was of 7 years, while the maximum experience level was of 25 years.
- Average experience of the respondents in BI field was 11 years. The minimum experience level recorded was of 5 years, while the maximum experience level was of 20 years.
• Average number of implementations done by the respondents was 12. While the minimum implementations recorded by a respondent were 4, maximum implementations were 35.

• Out of the 7 respondents, 3 belonged to the health-care / pharmaceutical / medico technique (as respondent would like to call it) sector of the industry, 2 belonged to the financial services / banking, and 1 each from the IT services / consulting and Kids / Toys segment.

• Section 1 of the questionnaire is aimed at getting to know the person, his experience, business sector of the organization and the quality of experience on a whole.

• Section 2 of the questionnaire is aimed at gaining more insight into the respondent’s work related aspects, his views, definitions, type of applications, vendors, tools and architecture they deal in day-to-day work life.

• Section 3 of the questionnaire deals more with the CSFs trying to extract their views, opinions and priorities as viewed by them with respect to BI implementation. And thus more useful for our analysis.

• Two CSFs namely, ‘Involvement of top management’ and ‘Involvement of end-users’ have been added to the list of organization perspective as compared to that of list of CSFs from the literature review.

• As mentioned before, Section 1 and Section 2 is meant only for knowing and understanding the existing system in organizations of various respondents, I would like to analyze only Section 3 for this research.

Table 4.1 consists of all the CSFs I have used during my interview process from questions 17 through 21 and have been arranged beneath each perspective I believe they correspond to. The alphabets placed in front of the CSFs separating them by a hyphen correspond to individual CSF and have been used to refer them during further analysis and graphical representation.
Table 4.1: List of CSFs from the questionnaire

Source: Developed for this research

<table>
<thead>
<tr>
<th>Organization Perspective</th>
<th>Process Perspective</th>
<th>Technical Perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td>A - Clear vision &amp; planning</td>
<td>G - Business driven methodology &amp; project Management</td>
<td>L - Robust &amp; extensible framework</td>
</tr>
<tr>
<td>B - Committed management support &amp; sponsorship</td>
<td>H - Balanced team composition</td>
<td>M - Data management &amp; quality issues</td>
</tr>
<tr>
<td>C - Involvement of top management</td>
<td>I - Usage of iterative prototyping to define requirements &amp; scope</td>
<td>N - Appropriate technology / tools</td>
</tr>
<tr>
<td>D - Partnership between business community &amp; IT</td>
<td>J - Map the solutions to the users</td>
<td>O - Integrated BI applications</td>
</tr>
<tr>
<td>E - Information governance via BICC</td>
<td>K - Change Management</td>
<td>P - Performance considerations</td>
</tr>
<tr>
<td>F - Involvement of end-users</td>
<td></td>
<td>Q - User training &amp; support</td>
</tr>
</tbody>
</table>

We are analyzing the responses of section 3 only for this research as they are most relevant for this research. When the responses from all the respondents are observed for the questions 13 to 16, some factors mentioned by them like ‘Support from key personnel’, ‘Quality of the process’, ‘Project management’, ‘High maintainability’ etc. have already been considered and are placed under respective perspectives they belong to hence those data are ignored. And further questions beyond 16 have been chosen to analyze.

While answering the questions from 17 to 19 respondents were asked to rate the CSFs in a range of 1 to 5, where, 1 corresponds to not critical and 5 corresponds to most critical. Hence, higher the total value of a particular CSF, more essential the CSF would be. Similarly, in graphical representation, higher the bars are placed more critical or essential that particular CSF could be considered.
### Analysis of question 17:

Table 4.2: Critical Scale Analysis of CSFs in the Organization Perspective  
Source: Developed for this research

<table>
<thead>
<tr>
<th>Respondents</th>
<th>A. Clear Vision &amp; Objectives</th>
<th>B. Committed management support &amp; sponsorship</th>
<th>C. Involvement of top management</th>
<th>D. Partnership between business community &amp; IT</th>
<th>E. Information governance via BI competency center</th>
<th>F. Involvement of end-users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent 1</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Respondent 2</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Respondent 3</td>
<td>3</td>
<td>4,5</td>
<td>3,5</td>
<td>3</td>
<td>3,5</td>
<td>3,5</td>
</tr>
<tr>
<td>Respondent 4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
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<td>5</td>
</tr>
<tr>
<td>Respondent 5</td>
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<td>4</td>
<td>5</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Respondent 6</td>
<td>5</td>
<td>5</td>
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<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Respondent 7</td>
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</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>31</strong></td>
<td><strong>29,5</strong></td>
<td><strong>26,5</strong></td>
<td><strong>26</strong></td>
<td><strong>24,5</strong></td>
<td><strong>23,5</strong></td>
</tr>
</tbody>
</table>
Figure 4.1: Critical Scale Analysis of Organizational Perspective
Source: Developed for this research

Analysis of question 18:
Table 4.3: Critical Scale Analysis of CSFs in the Process Perspective
Source: Developed for this research

<table>
<thead>
<tr>
<th>Respondents</th>
<th>G. Business driven methodology &amp; project management</th>
<th>H. Balanced team composition</th>
<th>I. Usage of iterative prototyping to define requirements &amp; scope</th>
<th>J. Map the solutions to the users</th>
<th>K. Change management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent 1</td>
<td>4</td>
<td>3</td>
<td>3</td>
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<td>1</td>
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<tr>
<td>Respondent 2</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Respondent 3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Respondent 4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>4</td>
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<tr>
<td>Respondent 5</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Respondent 6</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
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<tr>
<td>Respondent 7</td>
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<td>2</td>
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<td>5</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>29</strong></td>
<td><strong>21</strong></td>
<td><strong>26</strong></td>
<td><strong>25</strong></td>
<td><strong>25</strong></td>
</tr>
</tbody>
</table>
Critical Scale Analysis of Process Perspective

Source: Developed for this research

Analysis of question 19:

Table 4.4: Critical Scale Analysis of CSFs in the Technology Perspective

Source: Developed for this research

<table>
<thead>
<tr>
<th>Respondents</th>
<th>L. Robust &amp; extensible framework</th>
<th>M. Data management &amp; quality issues</th>
<th>N. Appropriate technology / tools</th>
<th>O. Integrated BI applications</th>
<th>P. Performance considerations</th>
<th>Q. User training &amp; support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent 1</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>1</td>
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<td>3</td>
</tr>
<tr>
<td>Respondent 2</td>
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<td>2</td>
<td>1</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Respondent 3</td>
<td>3</td>
<td>4</td>
<td>3,5</td>
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<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Respondent 4</td>
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<td>5</td>
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<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Respondent 5</td>
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<td>4</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Respondent 6</td>
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<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Respondent 7</td>
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<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Total:</td>
<td>27</td>
<td>32</td>
<td>26,5</td>
<td>21</td>
<td>28</td>
<td>27</td>
</tr>
</tbody>
</table>
While answering the questions 20 and 21, respondents are asked to prioritize the CSFs in the order of its priority in implementation of a BI system. Hence, the lower value (i.e., 1) given to a particular CSF could mean a higher priority among the other relevant factors. Hence, lower the total value of a particular CSF, that particular CSF could be considered more essential. Similarly, in graphical representation, lower the bars are placed more critical or essential that particular CSF could be considered.

**Analysis of question 20:**

**Organization Perspective**

**Table 4.5: Priority Analysis of CSFs in the Organization Perspective**

Source: Developed for this research

<table>
<thead>
<tr>
<th>Respondents</th>
<th>A. Clear Vision &amp; Objectives</th>
<th>B. Committed management support &amp; sponsorship</th>
<th>C. Involvement of top management</th>
<th>D. Partnership between business community &amp; IT</th>
<th>E. Information governance via BI competency center</th>
<th>F. Involvement of end-users</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>27</td>
<td>32</td>
<td>26.5</td>
<td>21</td>
<td>28</td>
<td>27</td>
</tr>
<tr>
<td>M</td>
<td>32</td>
<td>26.5</td>
<td>21</td>
<td>28</td>
<td>27</td>
<td>28</td>
</tr>
<tr>
<td>N</td>
<td>26.5</td>
<td>21</td>
<td>28</td>
<td>27</td>
<td>27</td>
<td>21</td>
</tr>
<tr>
<td>O</td>
<td>21</td>
<td>28</td>
<td>27</td>
<td>27</td>
<td>27</td>
<td>21</td>
</tr>
<tr>
<td>P</td>
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<tr>
<td>Q</td>
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<td>Respondent 2</td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Respondent 3</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Respondent 4</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Respondent 5</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Respondent 6</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>5</td>
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<td>Respondent 7</td>
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<td>1</td>
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<td>2</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
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<td>14</td>
<td>27</td>
<td>23</td>
<td>27</td>
<td>24</td>
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</tbody>
</table>

**Figure 4.4: Priority Analysis of Organization Perspective**

Source: Developed for the research
Table 4.6: Priority Analysis of CSFs in the Process Perspective

Source: Developed for this research

<table>
<thead>
<tr>
<th>Respondents</th>
<th>G. Business driven methodology &amp; project management</th>
<th>H. Balanced team composition</th>
<th>I. Usage of iterative prototyping to define requirements &amp; scope</th>
<th>J. Map the solutions to the users</th>
<th>K. Change management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent 1</td>
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<td>2</td>
<td>4</td>
<td>4</td>
<td>5</td>
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<td>Respondent 2</td>
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<td>2</td>
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</tr>
<tr>
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<td>5</td>
<td>1</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Respondent 4</td>
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</tr>
<tr>
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</tr>
<tr>
<td>Total:</td>
<td>13</td>
<td>21</td>
<td>20</td>
<td>23</td>
<td>22</td>
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</tbody>
</table>

Figure 4.5: Priority Analysis of Process Perspective

Source: Developed for this research
Technology Perspective

Table 4.7: Priority Analysis of CSFs in the Technology Perspective

Source: Developed for this research

<table>
<thead>
<tr>
<th>Respondents</th>
<th>L. Robust &amp; extensible framework</th>
<th>M. Data management &amp; quality issues</th>
<th>N. Appropriate technology / tools</th>
<th>O. Integrated BI applications</th>
<th>P. Performance considerations</th>
<th>Q. User training &amp; support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent 1</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>6</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Respondent 2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Respondent 3</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>6</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Respondent 4</td>
<td>4</td>
<td>1</td>
<td>5</td>
<td>6</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Respondent 5</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Respondent 6</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Respondent 7</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>20</strong></td>
<td><strong>13</strong></td>
<td><strong>25</strong></td>
<td><strong>33</strong></td>
<td><strong>21</strong></td>
<td><strong>23</strong></td>
</tr>
</tbody>
</table>

Figure 4.6: Priority Analysis of Technology Perspective

Source: Developed for this research
Analysis of question 21:

Table 4.8: Priority Analysis of all the CSFs with respect to BI Implementation

<table>
<thead>
<tr>
<th>Respondents</th>
<th>Organization perspective</th>
<th>Process perspective</th>
<th>Technical perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>Respondent 1</td>
<td>2</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>Respondent 2</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Respondent 3</td>
<td>1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Respondent 4</td>
<td>1</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Respondent 5</td>
<td>1</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Respondent 6</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Respondent 7</td>
<td>6</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
<td>21</td>
<td>49</td>
</tr>
</tbody>
</table>

Priority Analysis of all the CSF's

Figure 4.7: Priority Analysis of all CSFs

Source: Developed for this research

The responses to the above question 21 are for the priority order of the CSFs hence the lowest to highest total value in Table 4.8 and the shortest bar to the longest in the Figure 4.7
represent CSFs of decreasing priority order. The priority order for this data can be illustrated with the following Table:

**Table 4.9: Priority Order of CSFs with respect to overall BI implementation**

Source: Developed for this research

<table>
<thead>
<tr>
<th>Priority Order</th>
<th>CSFs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A – Clear vision &amp; planning</td>
</tr>
<tr>
<td>2</td>
<td>B – Committed management support &amp; sponsorship</td>
</tr>
<tr>
<td>3</td>
<td>M – Data management &amp; quality issues</td>
</tr>
<tr>
<td>4</td>
<td>D – Partnership between business community &amp; IT</td>
</tr>
<tr>
<td>5</td>
<td>F – Involvement of end-users</td>
</tr>
<tr>
<td>6</td>
<td>G – Business driven methodology &amp; project management</td>
</tr>
<tr>
<td>7</td>
<td>C – Involvement of top management</td>
</tr>
<tr>
<td>8</td>
<td>L – Robust &amp; extensible framework</td>
</tr>
<tr>
<td>9</td>
<td>E – Information governance via BI competency center</td>
</tr>
<tr>
<td>10</td>
<td>P – Performance considerations</td>
</tr>
<tr>
<td>11</td>
<td>Q – User training &amp; support</td>
</tr>
<tr>
<td>12</td>
<td>I – Usage of iterative prototyping to define requirements &amp; scope</td>
</tr>
<tr>
<td>13</td>
<td>H – Balanced team composition</td>
</tr>
<tr>
<td></td>
<td>N – Appropriate technology / tools</td>
</tr>
<tr>
<td>14</td>
<td>J – Map the solutions to the users</td>
</tr>
<tr>
<td>15</td>
<td>K – Change management</td>
</tr>
<tr>
<td>16</td>
<td>O – Integrated BI applications</td>
</tr>
</tbody>
</table>

### 4.8 Validity and Reliability

As all the data gathered during this research is of first-hand, I consider all the data as valid and reliable to the best of my knowledge. Responses to the questionnaire, by each respondent have been provided in Appendix 7.2 to 7.8 at the end of this report for further verifications, clarifications and analysis.
5 FINDINGS & CONCLUSION

5.1 Chapter Introduction

In this chapter I would like to present and discuss the findings of my analysis. Further I would like to discuss what these results could imply followed by the future research prospects in this area to conclude with.

5.2 Findings

After going through the analysis of data done in Data Analysis section 4.7, it is hard to understand the results of it by looking at that section. Hence, I have decided to make it easy for common people to understand it by joining the data in Tables 4.2, 4.3 and 4.4 for understanding the critical nature of all the CSFs. I would then prepare a table with list of CSFs in order of critical scale.

At the same time I would join the Tables 4.5, 4.6 and 4.7 to make it easy to understanding the priority order of CSFs when considered with each perspective. This would then give result to a table with priority order of CSFs with respect to the perspectives.

After generating both these tables I would analyze these tables with that of the priority table I have generated for the question 21, which is the priority table of CSFs with respect to overall BI implementation.
Table 5.1: Critical Scale Analysis of CSFs from the Perspectives

Source: Developed for this research

<table>
<thead>
<tr>
<th>Respondents</th>
<th>Organization Perspective</th>
<th>Process Perspective</th>
<th>Technology Perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>Respondent 1</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Respondent 2</td>
<td>5</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Respondent 3</td>
<td>3</td>
<td>4,5</td>
<td>3,5</td>
</tr>
<tr>
<td>Respondent 4</td>
<td>5</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Respondent 5</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Respondent 6</td>
<td>5</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Respondent 7</td>
<td>5</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Total:</td>
<td>31</td>
<td>29,5</td>
<td>26,5</td>
</tr>
</tbody>
</table>
Figure 5.1: Critical Scale Analysis of CSFs from the Perspectives

Source: Developed for this research

As the Table 5.1 and Figure 5.1 represent Critical Scale analysis of the CSFs, it can be understood that higher the total value in the table or bar line in the graphical presentation; higher is the critical nature of that particular CSF. Hence the order of CSFs with decreasing critical natures is represented in the following Table 5.2:
### Table 5.2: Critical order of the CSFs

Source: Developed for this research

<table>
<thead>
<tr>
<th>Critical Order</th>
<th>CSF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M – Data management &amp; quality issues</td>
</tr>
<tr>
<td>2</td>
<td>A – Clear vision &amp; planning</td>
</tr>
<tr>
<td>3</td>
<td>B – Committed management support &amp; sponsorship</td>
</tr>
<tr>
<td>4</td>
<td>G – Business driven methodology &amp; project management</td>
</tr>
<tr>
<td>5</td>
<td>P – Performance considerations</td>
</tr>
<tr>
<td>6</td>
<td>L - Robust &amp; extensible framework</td>
</tr>
<tr>
<td></td>
<td>Q – User training &amp; support</td>
</tr>
<tr>
<td>7</td>
<td>N – Appropriate technology / tools</td>
</tr>
<tr>
<td></td>
<td>C – Involvement of top management</td>
</tr>
<tr>
<td>8</td>
<td>D – Partnership between business community &amp; IT</td>
</tr>
<tr>
<td></td>
<td>I – Usage of iterative prototyping to define requirements &amp; scope</td>
</tr>
<tr>
<td>9</td>
<td>J – Map the solutions to the users</td>
</tr>
<tr>
<td></td>
<td>K – Change management</td>
</tr>
<tr>
<td>10</td>
<td>E - Information governance via BI competency center</td>
</tr>
<tr>
<td>11</td>
<td>F – Involvement of end users</td>
</tr>
<tr>
<td>12</td>
<td>H – Balanced team composition</td>
</tr>
<tr>
<td></td>
<td>O – Integrated BI applications</td>
</tr>
</tbody>
</table>

Now, I would join the Tables 4.5, 4.6 and 4.7 to get the priority order of the CSFs when considered with each perspective.
Table 5.3: Priority Analysis of CSF from the perspectives

Source: Developed for this research

<table>
<thead>
<tr>
<th>Respondents</th>
<th>Organization Perspective</th>
<th>Process Perspective</th>
<th>Technology Perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>Respondent 1</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Respondent 2</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Respondent 3</td>
<td>4</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Respondent 4</td>
<td>1</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Respondent 5</td>
<td>1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Respondent 6</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Respondent 7</td>
<td>3</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Total:</td>
<td>16</td>
<td>14</td>
<td>27</td>
</tr>
</tbody>
</table>
Figure 5.2: Priority Analysis of CSF from the perspectives

Source: Developed for this research

As this analysis is being done for the priority order of the CSFs, the lowest the total value in Table 5.2 has the highest priority order; similarly lower the bar level in the graphical representation gives highest priority to the CSF. The priority order in this case could be given by the following Table 5.4.
Table 5.4: Priority order of the CSFs

Source: Developed for this research

<table>
<thead>
<tr>
<th>Priority Order</th>
<th>CSF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>G - Business driven methodology &amp; project management</td>
</tr>
<tr>
<td></td>
<td>M – Data management &amp; quality issues</td>
</tr>
<tr>
<td>2</td>
<td>B - Committed management support &amp; sponsorship</td>
</tr>
<tr>
<td>3</td>
<td>A - Clear vision &amp; planning</td>
</tr>
<tr>
<td>4</td>
<td>I - Usage of iterative prototyping to define requirements &amp; scope</td>
</tr>
<tr>
<td></td>
<td>L – Robust &amp; extensible framework</td>
</tr>
<tr>
<td>5</td>
<td>H – Balanced team composition</td>
</tr>
<tr>
<td></td>
<td>P – Performance considerations</td>
</tr>
<tr>
<td>6</td>
<td>K - Change management</td>
</tr>
<tr>
<td>7</td>
<td>D - Partnership between business community &amp; IT</td>
</tr>
<tr>
<td></td>
<td>J – Map the solutions to the users</td>
</tr>
<tr>
<td></td>
<td>Q – User training &amp; support</td>
</tr>
<tr>
<td>8</td>
<td>F - Involvement of end-users</td>
</tr>
<tr>
<td>9</td>
<td>N – Appropriate technology / tools</td>
</tr>
<tr>
<td>10</td>
<td>C – Involvement of top management</td>
</tr>
<tr>
<td></td>
<td>E – Information governance via BI competency center</td>
</tr>
<tr>
<td>11</td>
<td>O – Integrated BI applications</td>
</tr>
</tbody>
</table>

At this stage we have 3 Tables, Table5.2 representing Critical Scale order of the CSFs, whereas, 4.9, and 5.4 both representing Priority Order of the CSFs. Hence to avoid the confusion, I would like to join the tables 4.9 and 5.4 to arrive at a single table for Priority Order of the CSFs.

Table 5.5: Analysis of priority order of CSFs in tables 4.9 & 5.4

Source: Developed for this research

<table>
<thead>
<tr>
<th>Table Number</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>O</th>
<th>P</th>
<th>Q</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Table 4.9</strong></td>
<td>1</td>
<td>2</td>
<td>7</td>
<td>4</td>
<td>9</td>
<td>5</td>
<td>6</td>
<td>13</td>
<td>12</td>
<td>14</td>
<td>15</td>
<td>8</td>
<td>3</td>
<td>13</td>
<td>16</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td><strong>Table 5.4</strong></td>
<td>3</td>
<td>2</td>
<td>10</td>
<td>7</td>
<td>10</td>
<td>8</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>7</td>
<td>6</td>
<td>4</td>
<td>1</td>
<td>9</td>
<td>11</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4</td>
<td>4</td>
<td>17</td>
<td>11</td>
<td>19</td>
<td>13</td>
<td>7</td>
<td>18</td>
<td>16</td>
<td>21</td>
<td>21</td>
<td>12</td>
<td>4</td>
<td>22</td>
<td>27</td>
<td>15</td>
<td>18</td>
</tr>
</tbody>
</table>

The graphical representation of the above table can be given with the following figure:
From the data analysis of above table 5.5, given below is the priority order of the CSFs:

**Table 5.6: Priority order of CSFs**

Source: Developed for this research

<table>
<thead>
<tr>
<th>Priority Order</th>
<th>CSFs</th>
</tr>
</thead>
</table>
| 1             | A – Clear vision & planning  
|               | B – Committed management support & sponsorship  
|               | M – Data management & quality issues |
| 2             | G – Business driven methodology & project management |
| 3             | D – Partnership between business community & IT |
| 4             | L – Robust & extensible framework |
| 5             | F – Involvement of end-users |
| 6             | P – Performance considerations |
| 7             | I – Usage of iterative prototyping to define requirements & scope |
| 8             | C – Involvement of top management |
| 9             | H – Balance team composition  
|               | Q – User training & support |
| 10            | E – Information governance via BI competency center |
| 11            | J – Map the solutions to the users  
|               | K – Change management |
Table 5.7: Analysis of Research Tables

Source: Developed for this research

<table>
<thead>
<tr>
<th>Table Number</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>O</th>
<th>P</th>
<th>Q</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 4.9</td>
<td>1</td>
<td>2</td>
<td>7</td>
<td>4</td>
<td>9</td>
<td>5</td>
<td>6</td>
<td>13</td>
<td>12</td>
<td>14</td>
<td>15</td>
<td>8</td>
<td>3</td>
<td>13</td>
<td>16</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Table 5.2</td>
<td>2</td>
<td>3</td>
<td>7</td>
<td>8</td>
<td>10</td>
<td>11</td>
<td>4</td>
<td>12</td>
<td>8</td>
<td>9</td>
<td>9</td>
<td>6</td>
<td>1</td>
<td>7</td>
<td>12</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Table 5.4</td>
<td>3</td>
<td>2</td>
<td>10</td>
<td>7</td>
<td>10</td>
<td>8</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>7</td>
<td>6</td>
<td>4</td>
<td>1</td>
<td>9</td>
<td>11</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>7</td>
<td>24</td>
<td>19</td>
<td>29</td>
<td>24</td>
<td>11</td>
<td>30</td>
<td>24</td>
<td>30</td>
<td>30</td>
<td>18</td>
<td>5</td>
<td>29</td>
<td>39</td>
<td>20</td>
<td>24</td>
</tr>
</tbody>
</table>

The graphical representation of the following table is illustrated in figure 5.3:

Figure 5.4: Analysis of Research Tables

Source: Developed for this research

From the above data which is in order of decreasing priority, lowest total value in Table 5.5 represents CSF of highest priority and vice versa; at the same time in the Figure 5.3 bar lines with shortest length are CSFs of highest priority and vice versa.
Thus, we can now generate an overall priority order of CSFs with the data we have gained through my interview responses, it is tabulated in the following table:

Table 5.8: Priority Order of CSFs developed from my Research

Source: Developed for this research

<table>
<thead>
<tr>
<th>Priority Order</th>
<th>CSF(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Data management &amp; quality issues</td>
</tr>
<tr>
<td>2</td>
<td>Clear vision &amp; planning</td>
</tr>
<tr>
<td>3</td>
<td>Committed management support &amp; sponsorship</td>
</tr>
<tr>
<td>4</td>
<td>Business driven methodology &amp; project management</td>
</tr>
<tr>
<td>5</td>
<td>Robust &amp; extensible framework</td>
</tr>
<tr>
<td>6</td>
<td>Partnership between business community &amp; IT</td>
</tr>
<tr>
<td>7</td>
<td>Performance considerations</td>
</tr>
<tr>
<td>8</td>
<td>Involvement of top management</td>
</tr>
<tr>
<td></td>
<td>Involvement of end-users</td>
</tr>
<tr>
<td></td>
<td>Usage of iterative prototyping to define requirements &amp; scope</td>
</tr>
<tr>
<td></td>
<td>User training &amp; support</td>
</tr>
<tr>
<td>9</td>
<td>Information governance via BI competency center</td>
</tr>
<tr>
<td></td>
<td>Appropriate technology / tools</td>
</tr>
<tr>
<td>10</td>
<td>Balanced team composition</td>
</tr>
<tr>
<td></td>
<td>Map the solutions to the users</td>
</tr>
<tr>
<td></td>
<td>Change management</td>
</tr>
<tr>
<td>11</td>
<td>Integrated BI applications</td>
</tr>
</tbody>
</table>

From the above research, addition of two new CSFs "Involvement of top management” and "Involvement of end-users" has been justified as they are placed well above the CSFs like "Map the solutions to the users” and "Balanced team composition” which were placed much higher in the CSFs list obtained from the data analysis part of literature review.

5.3 Discussion of findings

If we compare the Tables 3.4 and 5.8 we can observe that there is not much difference in the priority order of the CSFs listed in both the tables except that the CSFs ”Map the solutions to the users” and ”Balanced team composition” have been given more importance in the literature review, where as the respondents have placed them in the bottom of the list. Rather amusingly, the newly included CSFs in my interviews "Involvement of top management” and
“involvement of the end-users” were placed higher above them. Both the literature study and the interview process confirm placing the CSF “Integrated BI applications” at the bottom of the list.

CSFs are those areas of the project that are absolutely essential to its success. Whilst there is no hard and fast rule, it’s useful to limit the number of CSFs to absolute essentials. This helps you maintain the impact of your CSFs, and so give good direction and prioritization to other elements of your project strategy (AAHA, 2009). If we observe the Tables 3.4 and 5.6 each consists of at least 15 CSFs listed and when the list of CSFs become huge it would be impossible to concentrate on the various aspects of the project. Hence, I have decided to take top 5 CSFs from both the lists and merge them so that there would be a shorter list which could be more meaningful and hence allowing managers to focus more on the project. The list of CSFs thus evolved in alphabetical order is:

- Business driven methodology & project management
- Clear vision & planning
- Committed management support & sponsorship
- Data management & quality issues
- Map the solutions to the users
- Performance considerations and
- Robust & extensible framework

I would recommend the managers handling BI implementation aspects to focus on these above mentioned factors to have a prolonged run in keeping the project and process alive.

5.4 Implications and Recommendations

There are numerous factors that could affect the implementation process of BI system. The choice of CSFs may actually vary depending on which perspective the manager is looking from and hence the list of tables 4.2, 4.3 and 4.4 each show credibility of CSFs with an critical scale order and tables 4.5, 4.6 and 4.7 each show credibility of CSFs in their priority order from each perspective point of view.

Table 4.8 shows priority order of CSFs when viewed from overall perspective of the business. Table 5.1 shows critical scale order of CSFs when viewed from overall business perspective. Table 5.3 shows combined priority order of CSFs when viewed from individual
perspective and Table 5.5 shows priority order of CSFs when tables 4.8 and 5.3 are combined together.

To make it easy to understand, I would recommend managers to follow Table 5.1 when they want to view CSFs in critical scale order and Table 5.5 when they want to view CSFs in priority order of CSFs. And from overall BI implementation point of view I would recommend them to visit the list of CSFs given in section 5.3 of this chapter.

5.5 Implications for Future Research

During this project I have only recorded the CSFs as observed from various literatures and have then analyzed them. This seems to be a common approach but it does not give practical insight into the implementation aspects which could be more meaningful for the topic. Participation in the implementation process while reading all the variables (both internal and external) would have been a perfect approach for this kind of studies. Hence further research in these lines is recommended.
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7 APPENDIX

7.1 Questionnaire

Critical Success Factors of Business Intelligence Implementation

Interviewee’s name: ________________________
Organization: ________________________
Location: ________________________
Date: ________________________
Start time: ________________________
Finish Time: ________________________

Section 1: General Information

Please tell me about yourself:
1. Your background
   a. In what industry do you work? (E.g. IT services, Healthcare, Public Sector, Banking, etc)
   b. Size of your organization (no. of employees / active users, approximately)
   c. What is your current position in the organization?
   d. Whom do you report to?
   e. Total number of years in the industry?
   f. Number of years in BI area?
   g. Number of implementations done?

Section 2: Business Intelligence in general

2. How do you define Business Intelligence?
3. Most often than not Business Intelligence is interchangeably used with Data Warehousing and Reporting (Generation of reports), How would you relate BI with Data warehousing and Reporting?

4. What are the primary motives for implementing BI in an organization?
   
   a. The problems before implementation
   
   b. The benefits perceived after implementation

5. Please describe your organization’s BI system
   
   a. Implementation duration and stage (E.g., in-use, partially in-use or planning stage?)
   
   b. Primary BI applications or tools used (E.g., Dashboards, Scorecards, Mash-ups etc)
   
   c. Types of business users
   
   d. Applied BI vendors
   
   e. BI architecture
6. How would you define success or failure of BI implementation?

7. Choose all you wish to include in defining success factors of an BI implementation
   a. Support to key stakeholders
   b. Cost savings
   c. Improved business performance
   d. Better access to data
   e. Return on Investment
   f. User perception
   g. Number of active users
   h. Further comments:

8. What is the success rate of your implementations? (optional)
   a. (Mostly) Failure
   b. Slightly Failure
   c. Moderately Successful
   d. Successful

9. To what extent does the BI implementation contribute to your company’s performance?
   a. Not at all
   b. Slightly
   c. To some extent
   d. Significantly

10. For how many years has your BI deployment been available?

11. How would you categorize your BI implementation?
    a. Departmental implementation (E.g. Finance, Marketing, HR, Production etc)
    b. Unit wide (All Departments of the branch)
    c. Enterprise-wide implementation (all branches / all countries)

12. If data were available in tables, would you like to work on normalized form of data or data in dimensional model and why?

Section 3: Critical Success Factors
13. In terms of Organization or Business entity perspectives what do you think may influence implementation of BI system?
14. In terms of Process perspective what do you think may influence implementation of a BI system?

15. In terms of Technology perspective what do you think may influence implementation of a BI system?

16. Are there any other factors you feel important and why?

Please rate the following BI perspectives using the scale:

1. Not important 2. Little importance 3. Important 4. Very important 5. Essential / critically important

17. Organization Perspective
   a. Clear vision and planning 1 2 3 4 5
   b. Committed management support and sponsorship 1 2 3 4 5
   c. Involvement of top management 1 2 3 4 5
   d. Partnership between business community & IT 1 2 3 4 5
   e. Information governance via BI competency center 1 2 3 4 5
   f. Involvement of end-users 1 2 3 4 5

18. Process Perspective
   a. Business driven methodology & project management 1 2 3 4 5
   b. Balanced team composition 1 2 3 4 5
   c. Usage of iterative prototyping to define requirements & scope 1 2 3 4 5
   d. Map the solutions to the users 1 2 3 4 5
   e. Change management 1 2 3 4 5

19. Technology perspective
   a. Robust & extensible framework 1 2 3 4 5
   b. Data management & quality issues 1 2 3 4 5
   c. Appropriate technology/tools 1 2 3 4 5
   d. Integrated BI applications 1 2 3 4 5
   e. Performance considerations 1 2 3 4 5
   f. User training & support 1 2 3 4 5

20. Please prioritize the following factors with respect to each perspective

   **Organization Perspective**
   [ ] a. Clear Vision and planning
   [ ] b. Committed management support and sponsorship
   [ ] c. Involvement of top management
d. Partnership between business community & IT  
e. Information governance via BI competency center  
f. Involvement of end-users

**Process Perspective**

a. Business driven methodology & project management  
b. Balanced team composition  
c. Usage of iterative prototyping to define requirements & scope  
d. Map the solutions to the users  
e. Change Management

**Technology Perspective**

a. Robust & extensible framework  
b. Data management & quality issues  
c. Appropriate technology / tools  
d. Integrated BI applications  
e. Performance considerations  
f. User training & support

21. Please organize the following Critical Success Factors in a priority order you would like to place them with respect to an BI implementation

- a. Clear Vision and planning  
- b. Committed management support and sponsorship  
- c. Involvement of top management  
- d. Partnership between business community & IT  
- e. Information governance via BI competency center  
- f. Involvement of end-users  
- g. Business driven methodology & project management  
- h. Balanced team composition  
- i. Usage of iterative prototyping to define requirements & scope  
- j. Map the solutions to the users  
- k. Change Management  
- l. Robust & extensible framework  
- m. Data management & quality issues  
- n. Appropriate technology / tools  
- o. Integrated BI applications  
- p. Performance considerations  
- q. User training & support

Thank you very much
7.1 Interview of Respondent1

Critical Success Factors of Business Intelligence Implementation

Interviewee’s name: Respondent1
Organization: ________________________
Location: ________________________
Date: 29.09.2009
Start time: 9.15AM
Finish Time: 10.30AM

Section 1: General Information

Please tell me about yourself:
1. Your background
   a. In what industry do you work? (E.g. IT services, Healthcare, Public Sector, Banking, etc) – Finance
   b. Size of your organization (no. of employees / active users, approximately) – 800 in Denmark,
   c. What is your current position in the organization? – Manager, BI
   d. Whom do you report to? – Internal Service Director (part of IT)
   e. Total number of years in the industry? – 25 years
   f. Number of years in BI area? – 5 years
   g. Number of implementations done? – 7 to 8 in 2009 (mostly minor)

Section 2: Business Intelligence in general

2. How do you define Business Intelligence? – BI is data created for end users for the purpose of their needs.
3. Most often than not Business Intelligence is interchangeably used with Data Warehousing and Reporting (Generation of reports). How would you relate BI with Data warehousing and Reporting? – **BI only uses the information gathered by the Data warehouse**

4. What are the primary motives for implementing BI in an organization?
   a. The problems before implementation – **Build Data warehouse with SAS tools, Smart reporting, Automatic data gathering**
   b. The benefits perceived after implementation

5. Please describe your organization’s BI system
   a. Implementation duration and stage (E.g., in-use, partially in-use or planning stage?) – **2 week**
   b. Primary BI applications or tools used (E.g., Dashboards, Scorecards, Mash-ups etc) – **Risk and fraud dept., Financial transactions.**
   c. Types of business users – **Employees, specialists in data transformations, day to day users, CEO, controlling persons, communication department.**
   d. Applied BI vendors – **SAS**
   e. BI architecture – **Windows, Mainframes, SAS tables (flat), SPD (of SAS)**

6. How would you define success or failure of BI implementation? – **Gathering data and using it will define the success or failure**

7. Choose all you wish to include in defining success factors of an BI implementation
   a. Support to key stakeholders - **Yes**
   b. Cost savings
   c. Improved business performance - **Yes**
   d. Better access to data - **Yes**
   e. Return on Investment
   f. User perception - **Yes**
   g. Number of active users
   h. Further comments:
8. What is the success rate of your implementations? (optional)
   a. (Mostly) Failure
   b. Slightly Failure
   c. Moderately Successful
   d. Successful – Mostly

9. To what extent does the BI implementation contribute to your company’s performance?
   a. Not at all
   b. Slightly
   c. To some extent
   d. Significantly

10. For how many years has your BI deployment been available? – 2.5 years

11. How would you categorize your BI implementation?
   a. Departmental implementation (E.g. Finance, Marketing, HR, Production etc)
   b. Unit wide (All Departments of the branch)
   c. Enterprise-wide implementation (all branches / all countries)

12. If data were available in tables, would you like to work on normalized form of data or data in dimensional model and why?

Section 3: Critical Success Factors

13. In terms of Organization or Business entity perspectives what do you think may influence implementation of BI system? – Support from key personnel, being able to show results based on Business Objectives.

14. In terms of Process perspective what do you think may influence implementation of a BI system? – Automation, Quality of the process, project management

15. In terms of Technology perspective what do you think may influence implementation of a BI system? – High availability of the system, high maintainability

16. Are there any other factors you feel important and why? – Persistency in Organization thought process

Please rate the following BI perspectives using the scale:
1. Not important  2. Little importance  3. Important  4. Very important  5. Essential / critically important

17. Organization Perspective
   a. Clear vision and planning  1  2  3  4  5
   b. Committed management support and sponsorship  1  2  3  4
   c. Involvement of top management  1  2  3  4  5
   d. Partnership between business community & IT  1  2  3  4  5
   e. Information governance via BI competency center  1  2  3  4  5
   f. Involvement of end-users  1  2  3  4  5

18. Process Perspective
   a. Business driven methodology & project management  1  2  3  4  5
   b. Balanced team composition  1  2  3
   c. Usage of iterative prototyping to define requirements & scope  1  2  3  4
   d. Map the solutions to the users  1  2  3
   e. Change management  1  2  3

19. Technology perspective
   a. Robust & extensible framework  1  2  3
   b. Data management & quality issues  1  2  3
   c. Appropriate technology/tools  1  2  3
   d. Integrated BI applications  1  2  3  4  5
   e. Performance considerations  1  2  3
   f. User training & support  1  2  3  4  5

20. Please prioritize the following factors with respect to each perspective

**Organization Perspective**
[2] b. Committed management support and sponsorship
[5] c. Involvement of top management
[4] e. Information governance via BI competency center
[1] f. Involvement of end-users

**Process Perspective**
[1] a. Business driven methodology & project management
[4] c. Usage of iterative prototyping to define requirements & scope
[3] d. Map the solutions to the users

**Technology Perspective**

[1] c. Appropriate technology / tools
[6] d. Integrated BI applications
[2] e. Performance considerations

21. Please organize the following Critical Success Factors in a priority order you would like to place them with respect to an BI implementation

[1] b. Committed management support and sponsorship
[10] c. Involvement of top management
[4] e. Information governance via BI competency center
[6] f. Involvement of end-users
[7] g. Business driven methodology & project management
[12] i. Usage of iterative prototyping to define requirements & scope
[5] j. Map the solutions to the users
[16] k. Change Management
[13] l. Robust & extensible framework
[8] m. Data management & quality issues
[14] n. Appropriate technology / tools
[15] o. Integrated BI applications
[6,5] q. User training & support

"Thank you very much"
7.2 Interview of Respondent 2

Critical Success Factors of Business Intelligence Implementation

Interviewee’s name: Respondent 2
Organization: ________________________
Location: ________________________
Date: 30.09.2009
Start time: 2.05PM
Finish Time: 3.15PM

Section 1: General Information

Please tell me about yourself:
1. Your background
   a. In what industry do you work? (E.g. IT services, Healthcare, Public Sector, Banking, etc) - IT consultancy services with Information Management / BI
   b. Size of your organization (no. of employees / active users, approximately) - 220
   c. What is your current position in the organization? – Practice Director, BI advisory
   d. Whom do you report to? – CEO
   e. Total number of years in the industry? – 13
   f. Number of years in BI area? – 13
   g. Number of implementations done? - 10

Section 2: Business Intelligence in general

2. How do you define Business Intelligence? – Use of information for decision-making
3. Most often than not Business Intelligence is interchangeably used with Data Warehousing and Reporting (Generation of reports). How would you relate BI with Data warehousing and Reporting? – **Data warehouse is more like a backend part. BI is actively used part of the backend which uses information. BI is palette of things and reporting is part of it.**

4. What are the primary motives for implementing BI in an organization?
   a. The problems before implementation - **Monitoring the Business**
   b. The benefits perceived after implementation – **Better monitoring of the Business activities, integrate with Business model**

5. Please describe your organization’s BI system
   a. Implementation duration and stage (E.g., in-use, partially in-use or planning stage?) – **3-6 months**
   b. Primary BI applications or tools used (E.g., Dashboards, Scorecards, Mash-ups etc) – **Dash boards, score cards, reporting & analysis, solutions, integration into various applications, CRM, data mining**
   c. Types of business users – **Knowledge workers (day to day users), managers**
   d. Applied BI vendors – **Oracle, Informatica, Business Objects, SAP, Microsoft, IBM**
   e. BI architecture – **Hop-n-spoke**

6. How would you define success or failure of BI implementation?
   **Does it change the way people do their job ? and how they make their decision ?**

7. Choose all you wish to include in defining success factors of an BI implementation
   a. Support to key stakeholders - **Yes**
   b. Cost savings - **value generation**
   c. Improved business performance - **Yes**
   d. Better access to data - **Yes**
   e. Return on Investment - **Yes**
   f. User perception - **Yes**
g. Number of active users
h. Further comments: - does it change the way people do their job and how they make their decisions?

8. What is the success rate of your implementations? (optional)
   a. (Mostly) Failure
   b. Slightly Failure
   c. Moderately Successful
   d. Successful

9. To what extent does the BI implementation contribute to your company’s performance?
   a. Not at all
   b. Slightly
   c. To some extent
   d. Significantly

10. For how many years has your BI deployment been available?

11. How would you categorize your BI implementation?
    a. Departmental implementation (E.g. Finance, Marketing, HR, Production etc)
    b. Unit wide (All Departments of the branch)
    c. Enterprise-wide implementation (all branches / all countries)

12. If data were available in tables, would you like to work on normalized form of data or data in dimensional model and why?

Section 3: Critical Success Factors

13. In terms of Organization or Business entity perspectives what do you think may influence implementation of BI system? – ROI, Increasing effectiveness

14. In terms of Process perspective what do you think may influence implementation of a BI system? – Speed with which it can be developed, how it can be integrated, iterative

15. In terms of Technology perspective what do you think may influence implementation of a BI system? – user common toolset, training & support, concrete guidelines on development, maintainability and flexibility.

16. Are there any other factors you feel important and why?
Please rate the following BI perspectives using the scale:

1. Not important  2. Little importance  3. Important  4. Very important
   5. Essential / critically important

17. Organization Perspective
   a. Clear vision and planning 1 2 3 4 5
   b. Committed management support and sponsorship 1 2 3 4 5
   c. Involvement of top management 1 2 3 4 5
   d. Partnership between business community & IT 1 2 3 4 5
   e. Information governance via BI competency center 1 2 3 4 5
   f. Involvement of end-users 1 2 3 4 5

18. Process Perspective
   a. Business driven methodology & project management 1 2 3 4 5
   b. Balanced team composition 1 2 3 4 5
   c. Usage of iterative prototyping to define requirements & scope 1 2 3 4 5
   d. Map the solutions to the users 1 2 3 4 5
   e. Change management 1 2 3 4 5

19. Technology perspective
   a. Robust & extensible framework 1 2 3 4 5
   b. Data management & quality issues 1 2 3 4 5
   c. Appropriate technology/tools 1 2 3 4 5
   d. Integrated BI applications 1 2 3 4 5
   e. Performance considerations 1 2 3 4 5
   f. User training & support 1 2 3 4 5

20. Please prioritize the following factors with respect to each perspective

   **Organization Perspective**
   [1] b. Committed management support and sponsorship
   [1] c. Involvement of top management
   [2] e. Information governance via BI competency center
   [1] f. Involvement of end-users

   **Process Perspective**
   [1] a. Business driven methodology & project management
   [2] c. Usage of iterative prototyping to define requirements & scope
   [2] d. Map the solutions to the users
   [1] e. Change Management

   **Technology Perspective**
   [2] a. Robust & extensible framework
   [1] b. Data management & quality issues
21. Please organize the following Critical Success Factors in a priority order you would like to place them with respect to an BI implementation

   [1] b. Committed management support and sponsorship
   [1] c. Involvement of top management
   [2] e. Information governance via BI competency center
   [1] f. Involvement of end-users
   [2] g. Business driven methodology & project management
   [2] i. Usage of iterative prototyping to define requirements & scope
   [2] j. Map the solutions to the users
   [2] l. Robust & extensible framework
   [2] m. Data management & quality issues
   [4] o. Integrated BI applications
   [1] q. User training & support

Thank you very much
7.3 Interview of Respondent3

Critical Success Factors of Business Intelligence Implementation

Interviewee’s name: Respondent3
Organization: ________________________
Location: ________________________
Date: 05.10.2009
Start time: 10.30 AM
Finish Time: 12.00 Noon

Section 1: General Information

Please tell me about yourself:

1. Your background
   a. In what industry do you work? (E.g. IT services, Healthcare, Public Sector, Banking, etc) - Healthcare
   b. Size of your organization (no. of employees / active users, approximately) – 12000 globally
   c. What is your current position in the organization? – BI Manager
   d. Whom do you report to? – Marketing Manager – Director of Services - CMO
   e. Total number of years in the industry? -
   f. Number of years in BI area? – 20 years
   g. Number of implementations done? – 35 (100 – 200 analytic models, OLAP)

Section 2: Business Intelligence in general

2. How do you define Business Intelligence? - Decision worthy information in proper context at proper time and quality.
3. Most often than not Business Intelligence is interchangeably used with Data Warehousing and Reporting (Generation of reports). How would you relate BI with Data warehousing and Reporting? - It is **Process and tools to solve business problems. Reporting is one aspect of BI. It is abstraction of reporting. Decision support system is BI in broad scale**

4. What are the primary motives for implementing BI in an organization?
   
   a. The problems before implementation – **no availability of information or data and processes are with a gap**
   
   b. The benefits perceived after implementation

5. Please describe your organization’s BI system
   
   a. Implementation duration and stage (E.g., in-use, partially in-use or planning stage?) – **3 to 9 months in Denmark**
   
   b. Primary BI applications or tools used (E.g., Dashboards, Scorecards, Mash-ups etc) – **Reporting, Dash Boards, Predictive Analytics/Tree diagram**
   
   c. Types of business users – **Cashier to CEO**
   
   d. Applied BI vendors – **Product or Services**
   
   e. BI architecture – **Good User Interface, embedded in process, meeting expectations, structured, step-by-step, scalable or federated solution, user process and architecture choices**

6. How would you define success or failure of BI implementation? – **User satisfaction, sponsor satisfied, budget to maintain or improve, process improvement, meeting SLA’s, develop/transfer knowledge.**

7. Choose all you wish to include in defining success factors of an BI implementation
   
   a. Support to key stakeholders
   
   b. Cost savings
   
   c. Improved business performance
   
   d. Better access to data
   
   e. Return on Investment
   
   f. User perception
   
   g. Number of active users
   
   h. Further comments: **All can be factors based on context.**

8. What is the success rate of your implementations? (optional)
   
   a. (Mostly) Failure
   
   b. Slightly Failure
c. Moderately Successful  
d. Successful  

Predictive Analytics – 80% and reporting 50%  

9. To what extent does the BI implementation contribute to your company’s performance?  
   a. Not at all  
   b. Slightly  
   c. To some extent  
   d. Significantly  

10. For how many years has your BI deployment been available?  

11. How would you categorize your BI implementation?  
   a. Departmental implementation (E.g. Finance, Marketing, HR, Production etc)  
   b. Unit wide (All Departments of the branch)  
   c. Enterprise-wide implementation (all branches / all countries)  

12. If data were available in tables, would you like to work on normalized form of data or data in dimensional model and why?  

Section 3: Critical Success Factors  

13. In terms of Organization or Business entity perspectives what do you think may influence implementation of BI system? – CSF’s and KPI’s should be clubbed in real life scenario. Following development model, meeting investment predictions, implementation on time will influence the implementation  

14. In terms of Process perspective what do you think may influence implementation of a BI system? – Scalable, fast responsiveness, being satisfied with development process, project meeting the business needs with respect to technical or budget, vision of IT responsible group, quality, scalable, changeable and respectable.  

15. In terms of Technology perspective what do you think may influence implementation of a BI system?  

16. Are there any other factors you feel important and why?
Please rate the following BI perspectives using the scale:
2. Not important 3. Little importance 4. Important 5. Essential / critically important

17. Organization Perspective
   a. Clear vision and planning 1 2 3 4 5
   b. Committed management support and sponsorship 1 2 3 4.5 5
   c. Involvement of top management 1 2 3.5 4 5
   d. Partnership between business community & IT 1 2 3 4 5
   e. Information governance via BI competency center 1 2 3.5 4 5
   f. Involvement of end-users 1 2 3.5 4 5

18. Process Perspective
   a. Business driven methodology & project management 1 2 3 4 5
   b. Balanced team composition 1 2 3 4 5
   c. Usage of iterative prototyping to define requirements & scope 1 2 3 4 5
   d. Map the solutions to the users 1 2 3 4 5
   e. Change management 1 2 3 4 5

19. Technology perspective
   a. Robust & extensible framework 1 2 3 4 5
   b. Data management & quality issues 1 2 3 4 5
   c. Appropriate technology/tools 1 2 3.5 4 5
   d. Integrated BI applications 1 2 3 4 5
   e. Performance considerations 1 2 3 4 5
   f. User training & support 1 2 3 4 5

20. Please prioritize the following factors with respect to each perspective

   **Organization Perspective**
   [1] b. Committed management support and sponsorship
   [3] c. Involvement of top management
   [6] e. Information governance via BI competency center
   [2] f. Involvement of end-users

   **Process Perspective**
   [1] c. Usage of iterative prototyping to define requirements & scope
   [3] d. Map the solutions to the users

   **Technology Perspective**
   [1] b. Data management & quality issues
21. Please organize the following Critical Success Factors in a priority order you would like to place them with respect to an BI implementation

[4] b. Committed management support and sponsorship
[5] c. Involvement of top management
[10] d. Partnership between business community & IT
[15] e. Information governance via BI competency center
[6] f. Involvement of end-users
[7] g. Business driven methodology & project management
[14] h. Balanced team composition
[3] i. Usage of iterative prototyping to define requirements & scope
[17] j. Map the solutions to the users
[12] l. Robust & extensible framework
[2] m. Data management & quality issues
[16] o. Integrated BI applications
[9] q. User training & support

Thank you very much
7.4 Interview of Respondent 4

Critical Success Factors of Business Intelligence Implementation

Interviewee’s name: Respondent 4
Organization: ________________________
Location: ________________________
Date: 07.10.2009
Start time: 02.05 PM
Finish Time: 03.20 PM

Section 1: General Information

Please tell me about yourself:
1. Your background
   a. In what industry do you work? (E.g. IT services, Healthcare, Public Sector, Banking, etc) – FMCG(toys)-retail organization
   b. Size of your organization (no. of employees / active users, approximately) – 2000 to 3000
   c. What is your current position in the organization? – BI consultant
   d. Whom do you report to? - MD
   e. Total number of years in the industry? – 10 years
   f. Number of years in BI area? – 10 years
   g. Number of implementations done? – 10 major projects

Section 2: Business Intelligence in general

2. How do you define Business Intelligence? – Providing Business information for end users, decision makers of the organization. It focuses more on what can be delivered rather than technology
3. Most often than not Business Intelligence is interchangeably used with Data Warehousing and Reporting (Generation of reports). How would you relate BI with Data warehousing and Reporting? – **Data warehouse is the provider of data for BI.**

![Diagram of BI, Data warehouse, and Reporting part of BI]

4. What are the primary motives for implementing BI in an organization? – **Business driven requirements**

   a. The problems before implementation – **Reports of absence, requirement specification analysis, etc were not found**

   b. The benefits perceived after implementation – **faster information, qualitative, valuable business insight, better decision making.**

5. Please describe your organization’s BI system
   a. Implementation duration and stage (E.g., in-use, partially in-use or planning stage?) - **Partially**

   b. Primary BI applications or tools used (E.g., Dashboards, Scorecards, Mash-ups etc) – **Cognos – Adhoc analysis on cubes, reports**

   c. Types of business users – **Sales management, merchandising, marketing, day to day users and middle level management**

   d. Applied BI vendors - **Cognos, BI suit, Oracle Datawarehouse, Oracle warehouse builder.**

   e. BI architecture – **Hub-n-spoke**
6. How would you define success or failure of BI implementation? – User acceptance, usage is the criteria

7. Choose all you wish to include in defining success factors of an BI implementation
   a. Support to key stakeholders (for few solutions)
   b. Cost savings (sometimes)
   c. Improved business performance - Yes
   d. Better access to data - Yes
   e. Return on Investment (sometimes)
   f. User perception - Yes
   g. Number of active users
   h. Further comments:

8. What is the success rate of your implementations? (optional)
   a. (Mostly) Failure
   b. Slightly Failure
   c. Moderately Successful
   d. Successful
   e. Mostly Successful

9. To what extent does the BI implementation contribute to your company’s performance?
   a. Not at all
   b. Slightly
   c. To some extent
   d. Significantly

10. For how many years has your BI deployment been available? – 1.5 years

11. How would you categorize your BI implementation?
    a. Departmental implementation (E.g. Finance, Marketing, HR, Production etc)
    b. Unit wide (All Departments of the branch)
    c. Enterprise-wide implementation (all branches / all countries)

12. If data were available in tables, would you like to work on normalized form of data or data in dimensional model and why?
Section 3: Critical Success Factors

13. In terms of Organization or Business entity perspectives what do you think may influence implementation of BI system? – **User adoption, user needs, requirements vision. When it does not support user needs, it fails**

14. In terms of Process perspective what do you think may influence implementation of a BI system? – **Analysis of requirements**

15. In terms of Technology perspective what do you think may influence implementation of a BI system? – **Software policies of the company, technical perspective is not a major hindrance.**

16. Are there any other factors you feel important and why?

Please rate the following BI perspectives using the scale:

3. Not important 2. Little importance 3. Important 4. Very important 5. Essential / critically important

17. Organization Perspective
   a. Clear vision and planning 1 2 3 4 5
   b. Committed management support and sponsorship 1 2 3 4 5
   c. Involvement of top management 1 2 3 4 5
   d. Partnership between business community & IT 1 2 3 4 5
   e. Information governance via BI competency center 1 2 3 4 5
   f. Involvement of end-users 1 2 3 4 5

18. Process Perspective
   a. Business driven methodology & project management 1 2 3 4 5
   b. Balanced team composition 1 2 3 4 5
   c. Usage of iterative prototyping to define requirements & scope 1 2 3 4 5
   d. Map the solutions to the users 1 2 3 4 5
   e. Change management 1 2 3 4 5

19. Technology perspective
   a. Robust & extensible framework 1 2 3 4 5
   b. Data management & quality issues 1 2 3 4 5
   c. Appropriate technology/tools 1 2 3 4 5
   d. Integrated BI applications 1 2 3 4 5
   e. Performance considerations 1 2 3 4 5
   f. User training & support 1 2 3 4 5

20. Please prioritize the following factors with respect to each perspective

   **Organization Perspective**
   [2] b. Committed management support and sponsorship
   [6] c. Involvement of top management
[4] e. Information governance via BI competency center
[3] f. Involvement of end-users

**Process Perspective**
[5] c. Usage of iterative prototyping to define requirements & scope
[1] d. Map the solutions to the users

**Technology Perspective**
[1] b. Data management & quality issues
[6] d. Integrated BI applications
[2] e. Performance considerations

21. Please organize the following Critical Success Factors in a priority order you would like to place them with respect to a BI implementation
[3] b. Committed management support and sponsorship
[8] c. Involvement of top management
[9] e. Information governance via BI competency center
[2] f. Involvement of end-users
[14] g. Business driven methodology & project management
[10] h. Balanced team composition
[17] i. Usage of iterative prototyping to define requirements & scope
[4] j. Map the solutions to the users
[12] l. Robust & extensible framework
[6] m. Data management & quality issues
[16] o. Integrated BI applications
[5] q. User training & support

*Thank you very much*
7.5 Interview of Respondent5

Critical Success Factors of Business Intelligence Implementation

Interviewee’s name: Respondent5
Organization: ________________________
Location: ________________________
Date: 08.10.2009
Start time: 2.10 PM
Finish Time: 3.15 PM

Section 1: General Information

Please tell me about yourself:
1. Your background
   a. In what industry do you work? (E.g. IT services, Healthcare, Public Sector, Banking, etc) – Healthcare
   b. Size of your organization (no. of employees / active users, approximately) – 12000 globally
   c. What is your current position in the organization?
   d. Whom do you report to? – BI Manager
   e. Total number of years in the industry? – 16 years
   f. Number of years in BI area? – 12 years
   g. Number of implementations done? – 4

Section 2: Business Intelligence in general

2. How do you define Business Intelligence? – It is a medium of presenting existing information
3. Most often than not Business Intelligence is interchangeably used with Data Warehousing and Reporting (Generation of reports). How would you relate BI with Data warehousing and Reporting? – **Data warehouse has Data modeling, star schemas, labels, cubes, extracts, etc. Reports have excel sheets, ppt’s etc. BI brings together data warehouse and Reporting.**

4. What are the primary motives for implementing BI in an organization? – **Need and wish to have new information or knowledge to build new KPI’s, Technology driven, initiatives driven by bad data / information quality.**
   a. The problems before implementation
   b. The benefits perceived after implementation – **not always achieved**, specially of data quality

5. Please describe your organization’s BI system
   a. Implementation duration and stage (E.g., in-use, partially in-use or planning stage?) – **2 years duration, 2 not in use, 2 in full usage**
   b. Primary BI applications or tools used (E.g., Dashboards, Scorecards, Mash-ups etc) – **reports with analytical possibilities**
   c. Types of business users – **Top management – VP and above**
   d. Applied BI vendors – **SAP, Microsoft, Cognos and Business Objects**
   e. BI architecture

6. How would you define success or failure of BI implementation? – **User initiating some change based on information fetched from the system generated report.**

7. Choose all you wish to include in defining success factors of an BI implementation
   a. **Support to key stakeholders**
   b. Cost savings (could be)
   c. **Improved business performance**
   d. Better access to data (could be)
   e. **Return on Investment**
f. User perception *(could be)*
g. Number of active users *(could be)*
h. Further comments:

8. What is the success rate of your implementations? (optional)
   a. *(Mostly) Failure*  as compared to what we started to achieve
   b. Slightly Failure
   c. Moderately Successful
   d. Successful

9. To what extent does the BI implementation contribute to your company’s performance?
   a. Not at all
   b. Slightly
   c. To some extent
   d. **Significantly**

10. For how many years has your BI deployment been available?

   **One is 8 years and other 6 years**

11. How would you categorize your BI implementation?
   a. Departmental implementation (E.g. Finance, Marketing, HR, Production etc)
   b. **Unit wide** *(All Departments of the branch)*
   c. Enterprise-wide implementation (all branches / all countries)

12. If data were available in tables, would you like to work on normalized form of data or data in dimensional model and why? – **Dimensional for better performance**

**Section 3: Critical Success Factors**

13. In terms of Organization or Business entity perspectives what do you think may influence implementation of BI system? – **Organisation is ready to do performance management, structured management of KPI’s rather than gut feeling – KPI driven**

14. In terms of Process perspective what do you think may influence implementation of a BI system? – **short lead times, change to KPI’s faster, going live whenever something is built successfully. Iterative approach both in development, implementation and maintenance.**

15. In terms of Technology perspective what do you think may influence implementation of a BI system? – **Flexible framework**

16. Are there any other factors you feel important and why? – **BI system is presenting KPI’s but more often than not, it is the gut feeling rather than the KPI’s. BI is all about what customer needs and how they want to use it.**
Please rate the following BI perspectives using the scale:

4. Not important  2. Little importance  3. Important  4. Very important  5. Essential / critically important

17. Organization Perspective
   a. Clear vision and planning
   b. Committed management support and sponsorship
   c. Involvement of top management
   d. Partnership between business community & IT
   e. Information governance via BI competency center
   f. Involvement of end-users

18. Process Perspective
   a. Business driven methodology & project management
   b. Balanced team composition
   c. Usage of iterative prototyping to define requirements & scope
   d. Map the solutions to the users
   e. Change management

19. Technology perspective
   a. Robust & extensible framework
   b. Data management & quality issues
   c. Appropriate technology/tools
   d. Integrated BI applications
   e. Performance considerations
   f. User training & support

20. Please prioritize the following factors with respect to each perspective

**Organization Perspective**
[4] b. Committed management support and sponsorship
[5] c. Involvement of top management
[2] e. Information governance via BI competency center
[6] f. Involvement of end-users

**Process Perspective**
[1] c. Usage of iterative prototyping to define requirements & scope
[5] d. Map the solutions to the users

**Technology Perspective**
[1] a. Robust & extensible framework
21. Please organize the following Critical Success Factors in a priority order you would like to place them with respect to an BI implementation

1. a. Clear Vision and planning
2. e. Information governance via BI competency center
3. d. Partnership between business community & IT
4. i. Usage of iterative prototyping to define requirements & scope
5. g. Business driven methodology & project management
6. h. Balanced team composition
7. l. Robust & extensible framework
8. m. Data management & quality issues
9. b. Committed management support and sponsorship
10. c. Involvement of top management
11. n. Appropriate technology / tools
12. f. Involvement of end-users
13. o. Integrated BI applications
14. k. Change Management
15. q. User training & support
16. p. Performance considerations
17. j. Map the solutions to the users

Thank you very much
7.6 Interview of Respondent6

Critical Success Factors of Business Intelligence Implementation

Interviewee’s name: Respondent6
Organization:  
Location:  
Date: 10.10.2009
Start time:  
Finish Time:  

Section 1: General Information

Please tell me about yourself:
1. Your background
   a. In what industry do you work? (E.g. IT services, Healthcare, Public Sector, Banking, etc) IT
   b. Size of your organization (no. of employees / active users, approximately) 4000
   c. What is your current position in the organization? IT Consultant.
   d. Whom do you report to? Reporting Manager.
   e. Total number of years in the industry? 7
   f. Number of years in BI area? 5
   g. Number of implementations done? 7

Section 2: Business Intelligence in general

2. How do you define Business Intelligence? Business intelligence (BI) refers to skills, technologies, applications and practices used to help a business acquire a better understanding of its commercial context. Business intelligence may also refer to the collected information itself.
3. Most often than not Business Intelligence is interchangeably used with Data Warehousing and Reporting (Generation of reports). How would you relate BI with Data warehousing and Reporting? **BI applications use data gathered from a data warehouse or a data mart.** However, not all data warehouses are used for business intelligence nor do all business intelligence applications require a data warehouse. Reports are generated by using BI applications data.

4. What are the primary motives for implementing BI in an organization?
   a. The problems before implementation – **Data source, Data Collection and missing Business knowledge expert. Data inconsistency, Lack of knowledge of using BI tools by end users.**
   
   b. The benefits perceived after implementation – **Tools and techniques that support better business decisions. Turns data into meaningful interpretation and gives data a better insight. It is widely used in Performance Management. It help management to set process and objectives, goals, plans, metrics and Key Performance Indicators (KPI)**

5. Please describe your organization’s BI system
   a. Implementation duration and stage (E.g., in-use, partially in-use or planning stage?) **in-use**
   
   b. Primary BI applications or tools used (E.g., Dashboards, Scorecards, Mash-ups etc) **Scorecards and KPI’s (in built OLAP tool)**
   
   c. Types of business users – **All from top to bottom. (approx 10000 users)**
   
   d. Applied BI vendors – **MS, IBM**
   
   e. BI architecture – **Re-use and enhancement of existing framework developed in organization.**

6. How would you define success or failure of BI implementation?

   **The following are the key challenges for BI implementation:**
   
   a) **Understand the conflicting requirement between BI and operational BI.**
   b) **Becoming a default excel, one BI platform**
   c) **DW will deliver or required data and will solve all access information**
   d) **Assuming average user know how to use BI tools and have insight to data.**
If organization will able to overcome all above challenges fully (or more than 70 %) then it is a success in my eyes otherwise failure.

7. Choose all you wish to include in defining success factors of an BI implementation
   a. Support to key stakeholders
   b. Cost savings
   c. Improved business performance
   d. Better access to data
   e. Return on Investment
   f. User perception
   g. Number of active users
   h. Further comments: Employee goals are cleared towards target.

8. What is the success rate of your implementations? (optional)
   a. (Mostly) Failure
   b. Slightly Failure
   c. Moderately Successful
   d. Successful

9. To what extent does the BI implementation contribute to your company’s performance?
   a. Not at all
   b. Slightly
   c. To some extent
   d. Significantly

10. For how many years has your BI deployment been available? 4 years

11. How would you categorize your BI implementation?
   a. Departmental implementation (E.g. Finance, Marketing, HR, Production etc)
   b. Unit wide (All Departments of the branch)
   c. Enterprise-wide implementation (all branches / all countries) 10000 users approx.

Section 3: Critical Success Factors

12. In terms of Organization or Business entity perspectives what do you think may influence implementation of BI system?

   It must benefit the organization in terms of setting goals and objectives. BI data should be used to evaluate the performance that is actual vs planned.

   a. Support All Users Via Integrated BI Suites.
   b. Role and need based user segmentation.
   c. Common Framework.
   d. It should be Conforms to the Way Users Work.
13. In terms of Process perspective what do you think may influence implementation of a BI system?

a. Delivers Actionable Information
b. It should suit to Business driven methodology and project Management.
   c. Quick rapid development environment to build prototype.

14. In terms of Technology perspective what do you think may influence implementation of a BI system?

a. Provide a Robust and Extensible Platform
   b. BI software – tools, platforms, applications and alike.
   c. Integrates with Desktop and Operational Applications
   d. User manual and training.

15. Are there any other factors you feel important and why?

BI platforms should provide tight linkages to data integration tools and quicker metadata exchange to deliver actionable information at right-time.

Please rate the following BI perspectives using the scale:
5. Not important 2. Little importance 3. Important 4. Very important 5. Essential / critically important

16. Organization Perspective (make a bracket around your choice)
   a. Clear vision and planning 1 2 3 4 5
   b. Committed management support and sponsorship 1 2 3 4 5
   c. Involvement of top management 1 2 3 4 5
   d. Partnership between business community & IT 1 2 3 4 5
   e. Information governance strategy (BI competency center) 1 2 3 4 5
   f. Involvement of casual users (ad-hoc / shop floor level users) 1 2 3 4 5

17. Process Perspective
   a. Business driven methodology & project management 1 2 3 4 5
   b. Balanced team composition 1 2 3 4 5
   c. Usage of iterative prototyping to define requirements & scope 1 2 3 4 5
   d. Map the solutions to the users 1 2 3 4 5
   e. Change management 1 2 3 4 5

18. Technology perspective
   a. Robust & extensible framework 1 2 3 4 5
   b. Data management & quality issues 1 2 3 4 5
   c. Appropriate technology/tools 1 2 3 4 5
   d. Integrated BI applications 1 2 3 4 5
   e. Performance considerations 1 2 3 4 5
   f. User training & support 1 2 3 4 5
19. Please prioritize the following factors with respect to each perspective

**Organization Perspective**
[ 3 ] b. Committed management support and sponsorship
[ 1 ] c. Involvement of top management
[ 5 ] e. Information governance via BI competency center
[ 6 ] f. Involvement of end-users

**Process Perspective**
[ 1 ] a. Business driven methodology & project management
[ 2 ] c. Usage of iterative prototyping to define requirements & scope
[ 5 ] d. Map the solutions to the users

**Technology Perspective**
[ 1 ] a. Robust & extensible framework
[ 5 ] d. Integrated BI applications
[ 4 ] e. Performance considerations

20. Please organize the following Critical Success Factors in a priority order you would like to place them with respect to an BI implementation

[ 2 ] b. Committed management support and sponsorship
[ 1 ] c. Involvement of top management
[ 9 ] d. Partnership between business community & IT
[ 16] e. Information governance via BI competency center
[ 7 ] f. Involvement of end-users
[ 4 ] g. Business driven methodology & project management
[ 12 ] h. Balanced team composition
[ 10 ] i. Usage of iterative prototyping to define requirements & scope
[ 15 ] j. Map the solutions to the users
[ 5 ] l. Robust & extensible framework
[ 8 ] m. Data management & quality issues
[ 13 ] o. Integrated BI applications
[ 17 ] q. User training & support

Thank you very much
7.7 Interview of Respondent 7

Critical Success Factors of Business Intelligence Implementation

Interviewee's name: Respondent 7
Organization: _______________________
Location: _______________________
Date: 30/10/2009
Start time: 02:50 PM
Finish Time: 04:25 PM

Section 1: General Information

Please tell me about yourself:
1. Your background
   a. In what industry do you work? (E.g. IT services, Healthcare, Public Sector, Banking, etc) – Medico Technique
   b. Size of your organization (no. of employees / active users, approximately) – 7000 to 8000
   c. What is your current position in the organization? – Senior Manager
   d. Whom do you report to? – Head of BICC
   e. Total number of years in the industry? – 9 years
   f. Number of years in BI area? – 9 years
   g. Number of implementations done? – 10 to 15 major ones

Section 2: Business Intelligence in general

2. How do you define Business Intelligence? - The process, concept or methodology we use to improve decision making in the business. It also requires applications, ETL tools, Database, etc.
3. Most often than not Business Intelligence is interchangeably used with Data Warehousing and Reporting (Generation of reports). How would you relate BI with Data warehousing and Reporting? – **Data warehouse is the process of storing the data, staging and dimension modeling. BI is more of a business goal. It is not necessary to have a data warehouse. We need fact based system.**

4. What are the primary motives for implementing BI in an organization? – **Tool to make business decision, how to optimize a process to get high quality data**

   a. The problems before implementation – **lack of ownership in the business, quality of data**

   b. The benefits perceived after implementation – **better data quality; optimized process of reporting; transparency of data; focus on core business**

5. Please describe your organization’s BI system
   a. Implementation duration and stage (E.g., in-use, partially in-use or planning stage?) - **3 to 6 months**

   b. Primary BI applications or tools used (E.g., Dashboards, Scorecards, Mash-ups etc) – **Cognos8, Datastage (ETL), DB2**

   c. Types of business users – **Reports for middle management / Executive management, packages for operational management**

   d. Applied BI vendors – **IBM, Erwin for data modeling**

   e. **BI architecture – Hub-n-spoke with dimensional modeling**
6. How would you define success or failure of BI implementation? – **If it is used for business decision making, it is a success or else a failure**

7. Choose all you wish to include in defining success factors of an BI implementation
   a. Support to key stakeholders
   b. Cost savings
   c. Improved business performance
   d. Better access to data
   e. Return on Investment
   f. User perception
   g. Number of active users
   h. Further comments: **b,c – cost benefits and a, c, d are success factors**

8. What is the success rate of your implementations? (optional)
   a. (Mostly) Failure
   b. Slightly Failure
   c. **Moderately Successful**
   d. Successful

9. To what extent does the BI implementation contribute to your company’s performance?
   a. Not at all
   b. Slightly
   c. **To some extent**
   d. Significantly

10. For how many years has your BI deployment been available?
    9 years

11. How would you categorize your BI implementation?
    a. Departmental implementation (E.g. Finance, Marketing, HR, Production etc)
    b. Unit wide (All Departments of the branch)
    c. **Enterprise-wide implementation (all branches / all countries)**

12. If data were available in tables, would you like to work on normalized form of data or data in dimensional model and why?
    **Depends on persons accessing the data**

**Section 3: Critical Success Factors**

13. In terms of Organization or Business entity perspectives what do you think may influence implementation of BI system? - **support business analysts to setup business requirements, strategy or vision with respect to BI, cost of BI implementation**
14. In terms of Process perspective what do you think may influence implementation of a BI system? - Project management, process to maintain or operate the system, process to monitor the system before and after the implementation, right resources, prioritization of resource, availability of quality resources.

15. In terms of Technology perspective what do you think may influence implementation of a BI system? – bad data quality, toolset not suitable for the business requirements.

16. Are there any other factors you feel important and why?

Please rate the following BI perspectives using the scale:

17. Organization Perspective
   a. Clear vision and planning 1 2 3 4 5
   b. Committed management support and sponsorship 1 2 3 4 5
   c. Involvement of top management 1 2 3 4 5
   d. Partnership between business community & IT 1 2 3 4 5
   e. Information governance via BI competency center 1 2 3 4 5
   f. Involvement of end-users 1 2 3 4 5

18. Process Perspective
   a. Business driven methodology & project management 1 2 3 4 5
   b. Balanced team composition 1 2 3 4 5
   c. Usage of iterative prototyping to define requirements & scope 1 2 3 4 5
   d. Map the solutions to the users 1 2 3 4 5
   e. Change management 1 2 3 4 5

19. Technology perspective
   a. Robust & extensible framework 1 2 3 4 5
   b. Data management & quality issues 1 2 3 4 5
   c. Appropriate technology/tools 1 2 3 4 5
   d. Integrated BI applications 1 2 3 4 5
   e. Performance considerations 1 2 3 4 5
   f. User training & support 1 2 3 4 5

20. Please prioritize the following factors with respect to each perspective
   **Organization Perspective**
   [1] b. Committed management support and sponsorship
   [6] c. Involvement of top management
   [4] e. Information governance via BI competency center
   [5] f. Involvement of end-users
**Process Perspective**

[1] a. Business driven methodology & project management  
[5] c. Usage of iterative prototyping to define requirements & scope  
[3] d. Map the solutions to the users  

**Technology Perspective**

[3] a. Robust & extensible framework  
[4] d. Integrated BI applications  
[1] e. Performance considerations  

21. Please organize the following Critical Success Factors in a priority order you would like to place them with respect to an BI implementation  

[1] b. Committed management support and sponsorship  
[13] c. Involvement of top management  
[10] e. Information governance via BI competency center  
[7] g. Business driven methodology & project management  
[17] h. Balanced team composition  
[16] i. Usage of iterative prototyping to define requirements & scope  
[15] j. Map the solutions to the users  
[5] l. Robust & extensible framework  
[3] m. Data management & quality issues  
[12] n. Appropriate technology / tools  
[8] o. Integrated BI applications  
[9] q. User training & support  

*Thank you very much*