The Impact of Adopting “Business Intelligence (BI)” in Organizations

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Abstract

In economically turbulent times, Business Intelligence (BI) is increasingly being used to mitigate risk and increase certainty. The evolution of BI from a series of technologies to a platform for supporting strategies is analyzed in this thesis. The concentration is on how BI can streamline manufacturing, quality assurance, marketing and customer service are evaluated, as are the potential payoffs of increasing the level of insight an organization has. The thesis also includes analysis of how the more complex value chain processes including build-to-order, configure-to-order and quote-to-order can be made more efficient and profitable through the inclusion of BI and its associated analytics and technologies. The inclusion of the Delphi research technique makes this paper unique and strong in its content as well. The role of BI has shifted from being used in specific functional areas of an organization to being strategic in scope. The intent of this thesis is to evaluate its contributions to the customer-facing processes that are the most complex and most challenging to sustain, making BI an indispensible platform for their successful execution on the base of theories and practical experience of the BI experts.

Keywords:

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List of Abbreviations

BI: Business Intelligence
DSS: Decision Support System
ERP: Enterprise Resource Planning
CRM: Customer Relationship Management
SCM: Supply Chain Management
ETL: Extract, Transform, Load
OLAP: On-Line Analytical Processing
KPI: Key Performance Indicator
MDM: Master Data Management

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Chapter 1: Introduction

1.1 Introduction to Business Intelligence

Business Intelligence (BI) and the many analytics systems that support demand management, predictive analytics, revenue modeling and role-based intelligence within organizations are critical for any organization to survive in today’s incredibly turbulent marketplace. The additional factor of the Internet in general and digital marketing specifically is the ability to capture behavior and choices on the Web, as every Web-based application generates user data electronically. This alone has been responsible for an exceptional level of growth in BI adoption within marketing, sales, and service organizations globally. It is also redefining the functionally components of analytics, reporting and enterprise-wide use of data intelligence and insight used for streamlining decision-making processes.

The two areas of new product introduction and manufacturing, the latter is where BI’s potential to create significant measurable value for organizations is being measured today. Adopting BI systems into role-based manufacturing systems is delivering quantifiable performance and higher Return on Investment (ROI) due to data-hungry processes being automated through the use of these techniques and technologies.

1.2 Problem to address

The use of Business Intelligence refers to certain skills, technologies, practices, and processes that are employed as part of supporting decision making in an organization. The applications of Business Intelligence technology have historical, contemporary and even predictive view points of the business undertakings of an organization. This technology contains certain unique functions that are intrinsic to the particular systems. The adoption of BI systems therefore is aimed at the support of better quality decision making within an organization. It can also be referred to as decision support system (DSS).
The adoption of Business Intelligence systems is critical to the smooth and coordinated operation of each and every organization. However; it has not been fully integrated in many firms and organization. This has resulted to poor communication within the different enterprises and hence a loss of coordination and mismanagement. This paper therefore seeks to evaluate the impact of implementing BI systems on a firm’s profitability and overall performance.

1.3 Research Questions

The ultimate goal of this paper is to answer these following research questions.

1. Why is it necessary to implement a BI system?

2. What are the key determinants of the success of Business Intelligence systems?

3. Whose responsibility is it to initiate and implement the BI system?

4. What is the impact of successful adoption of the BI system?

The conclusion can be considered as a set of best practices rather than a strict model while implementing a Business Intelligence system.

During the first phase the answer of the research questions will be based on theoretical studies while at the end the summary will be revised by using the result of the Delphi research study.

1.4 Purpose of the Study

The main purpose of this thesis is to show how organizations can increase their performance as well as profits when Business Intelligence (BI) systems are deployed properly. The message to the industry is that in today’s modern world a strong decision support system is must in order to stay in the competitive market. The study results will be sufficient enough to highlight these points to the top decision makers of the organizations.
1.5 Demarcations

The study is not intended to discuss the technical details of implementing Business Intelligence Systems. The intention is to concentrate on the managerial and organizational aspect of Business Intelligence. The paper intends to explore how to gain maximum profit from BI systems in organizations. Some of the technical overviews which are discussed are only on the purpose of making the paper more understandable to the audience.

1.6 Pre Requisites and Assumptions

In order to conduct the study the pre requisite is that we have good contacts with the people who have vast amount of experience in the field of Business Intelligence Consultancy, IT governance managerial position in organizations. Having sufficient amount of access to case studies related to BI is also one of the requirements of this paper.

Chapter 2: Research Methodology

2.1 Research Approach

The research will be conducted by reviewing books and existing research papers on Business intelligence. We will also conduct interviews of 3- 4 Experts who has vast experience with BI and management in organizations. Each expert will fill up a short recommendation form which will state what to do and not to do before during and after implementation of a BI system in an organization in order to get most out of it. While filling up the recommendation form they will emphasize on three key factors which are technology, management and stakeholders. Experts
will also answer a series of 13 questions which will help us to summarize our study. This is quite similar to Delphi Methodology of research. In the next paragraph there is a clear explanation of the way this methodology has been applied to this paper.

The methodology of this study is primarily based on secondary research in the areas of BI and analytics from an evolutionary standpoint, specifically looking at their contributions to complex business processes. Of the 59 references included as part of this study, four are books. The books cited and used as the foundation of the thesis concentrate on the intersection of technology, BI and analytics. The books include Web Services: Concepts, Architectures and Applications (ref 12), Building Customer Data Warehouses for a Marketing and Service Environment (ref 61), Taking Risks: The Management of Uncertainty (ref 43), and Q Methodology (ref 47). Specific attributions are made throughout the thesis to these books and denote their contributions to this effort.

2.2 Delphi Method

Delphi Method is a research technique which is systematic and interactive forecasting method hugely depends on a panel of experts. The concept is that a panel of experts answers a series of questionnaire in few rounds. At the end of each round a monitoring team summarizes the results without revealing the expert’s name and sends it back to the expert for a final thought. The experts can either revise their answers or stick with their own opinion. In this way after a certain number of rounds the research team expects to converge towards correct answers by decreasing the number of incorrect answers.

“Usually Delphi, whether it be conventional or real-tune, undergoes four distinct phases. The first phase is characterized by exploration of the subject under discussion, wherein each individual contributes additional information he feels is pertinent to the issue. The second phase involves the process of reaching an understanding of how the group views the issue (i.e., where the members agree or disagree and what they mean by relative terms such as importance, desirability, or feasibility). If there is significant disagreement, then that disagreement is
explored in the third phase to bring out the underlying reasons for the differences and possibly to evaluate them. The last phase, a final evaluation, occurs when all previously gathered information has been initially analyzed and the evaluations have been fed back for consideration.” (A. Linstone, 2002)

During this study the Delphi method was used by trimming it down or in other words we used the concept of method tailoring.

“The approach taken is slightly different from the conventional one, in which tenets for method tailoring might be derived deductively from some a priori stated set of axioms.” (Fitzgerald, 2000)

The primary target of the conducted Delphi study was to arrange 5 rounds of feedback from the experts. But because of the time limitations and inadequate access to the large number of experts the process was stopped after 3 rounds as the results were thought to be good enough to reach conclusions.

Increase in the number of rounds definitely would have made the results more purified. The number of experts taken part in this study is 4. Again an increase in the number of experts would have made the results more interesting. According to the rule of Delphi method all the expert’s personal details were kept confidential.

2.3 Secondary Data Collection

Relying on both deductive and inductive processes for the attainment of research objectives, this methodology concentrates on secondary research analysis and synthesis.

“Secondary analysis involves the use of existing data, collected for the purposes of a prior study, in order to pursue a research interest which is distinct from that of the original work; this may be a new research question or an alternative perspective on the original question.” (Hinds, Vogel and Clarke-Steffen 1997, Szabo and Strang 1997).
The induction process is specifically used for defining a generalization from the facts and looking for patterns in the data over time. This approach to the research included in this thesis has been useful for determining the impact of BI and analytics on complex business processes, where their impact makes a significant financial contribution to the attainment of the research questions. The focus of inductive reasoning is also on how to extrapolate the impact of BI across each area of an organizations’ value chain as well. This approach to the analysis of the data has made it possible for the conclusions of financial contribution by type of BI and analytical technology to be made.

The secondary approach is that of deductive reasoning. This is accomplished through a series of conclusions being drawn from a series of prior researched facts and frameworks. This approach has led to the development of a series of quantifiable returns from including BI and analytics into a broader framework of the build-to-order, configure-to-order and quote-to-order strategies of companies. These process areas have shown the greatest level of elasticity and growth given the inclusion of BI and analytical tools over time.

2.4 Research Strategies for the Literature Study

“A methodological review of past literature is a crucial endeavor for any academic research work.” (Webster & Watson, 2002).

An intensive literature review including analysis of case studies that highlighted the impact of BI and analytics on the performance of selling, quoting and service strategies was initiated.

“Novice researchers tend to approach the literature review as nothing more than a collection of summaries of papers or an elaborated annotated bibliography of multiple research manuscripts.” (Webster & Watson, 2002)

So, a good literature review should be way better than that.

From the 49 references and four books consulted, it became apparent that the direction of the BI field was an evolutionary one, increasing speed as a result of the uncertainty in global
financial markets. Further, BI and analytics platforms were being increasingly used for making
the most out of insights gained from social networks. That aspect of BI and analytics however
are outside the scope of this study, as the quantifiable, actual financial returns of these tools in
social networks has yet to be verified in empirical research. The focus of this study is on how to
BI and analytics frameworks are going through an evolution towards more focus on delivering
financial value and Return on Investment (ROI) to those companies investing in it. An extensive
analysis of second research from ABI/Inform Global, Emerald and EBSCO Host was completed, in
addition to analysis of the leading vendors in the BI market arena including Business Objects
(SAP), Oracle, IBM, Microsoft, Mercury Interactive and many smaller, best-of-breed software
companies.

Chapter 3: Literature Review

3.1 Introduction

Today the majority of organizations are relying on outmoded data analytics and reporting
systems that have over time become their single version of the truth. Despite the rapid gains in
BI systems and decision support systems (DSS) there continues to be a reliance on legacy
systems that are often not integrated to each other and do not have predictive analytics
capability. Studies indicate for example that less than 20% of any given analytics applications
are used on a regular basis within a business process workflow standpoint. Given how critical
time is today as a competitive aspect of any company’s performance and market share, it seems
astounding that more of the functionality of a given data analytics and reporting system is not
more used.

The focus on how to create more value from information by aligning it with the needs of
knowledge workers who are engaged in complex, information-demanding roles is where BI is
gaining the greatest traction globally today. The small gains made with BI and DSS platforms are
being driven by how roles in organizations are shifting from tightly defined, hierarchical
organizational structures to more team-based ones. BI is in effect allowing organizations to shift
their organizational structures to more carefully and thoughtfully align with how their customers want to buy from them, and how they want to stay connected with them over the long-term. This is where predictive analytics and the ability to interpret massive amounts of customer data, and then interpolate projected future purchase decisions become valuable.

When role-based analytics are integrated into a manufacturing environment, the value of the data is multiplied. This is particularly true in the case of supply chain and distribution channel integration to production. While companies many rely on a single Enterprise Resource Planning (ERP) system for this type of analysis and data, these types of monolithic systems have proven to be more detrimental to getting strategies accomplished than actually enabling performance. Analytics in general and BI in particular is critically important in manufacturing because it can significantly increase the level of product quality and in so doing, increase customer satisfaction as well.

3.2 Key Determinants of Success with BI Systems

Of the many important determinants of success with BI systems, the most critical is a solid understanding of the communication and collaboration at the process level first, followed by a continual maturing in the use of data analytics reporting tools that span across multiple databases is critical. Figure 1, Fortune 1,000 Adoption of BI and Performance Management illustrates the shift in interest in these areas between 2008 and 2009. The reliance on analytic infrastructure is a third priority, which illustrates the importance of a DSS platform to support long-term growth. The reliance on Search as a means to provide access to data instantly in addition to dashboards and score carding of processes is also evident in Figure 1. What underscores the entire series of adoption points however is the focus on a collaborative workflow or process that needs to be managed to a series of metrics. This is a key finding from the experts consulted as part of this thesis. Customer Relationship Management (CRM), Demand Management, Supply Chain Management (SCM), and Revenue Management are all highly collaborative processes that are well suited for automation through BI systems that
capture their performance and set the foundation for future gains in efficiency and profitability over time.

Figure 1: Fortune 1,000 Adoption of BI and Performance Management

![Graph showing growth in BI/PM use, 2008 to 2009](image)

Source: (Lamont, 2008), analysis of cited data

Figure 1, Fortune 1,000 adoption of BI and Performance Management initiatives illustrates that the most critical factor in the success of a BI implementation is seeking out processes that are highly collaborative in nature, and that also rely on intensive amounts of data. As will be seen later in this analysis, the quote-to-order process used within manufacturing companies is a prime example of this type of information-intensive process where the value of BI can be proven.

Another critical success factor of an effective BI implementation is a reliance on balanced scorecards to not only measure collaboration, but also enable greater levels of information sharing and exchange. As the greatest impediment to making BI strategies work is resistance to
change, it is critical for scorecards and metrics of performance to actively promote collaboration.

**Figure 2: Areas of Greatest Strategic Investment in BI, 2009 – 2010**

Source: (Lamont, 2008), analysis of cited data

Figure 1 makes this point clearly concerned collaboration, but later in the analysis, the point will be very clear from an analysis of the quote-to-order strategy within one manufacturer who chose to standardize BI and created an entire DSS system to streamline the quoting process. Figure 2: Areas of Greatest Strategic Investment in BI, 2009 – 2010 illustrates what specific KPIs and measures of performance that the best BI implementations are relying on. Planning, budgeting and forecast applications, followed by dashboards and scorecard products, with
business intelligence and reporting tools being the third most prevalently used form of BI tools illustrate how best practices in analysis are initiated and maintained over time.

3.3 Factors to Ensure Successful BI System Implementations That Lead To Competitive Advantage

The reliance on BI systems and processes to deliver competitive results often must first bring together isolated databases, data marts and data warehouses so that strategic plans and initiatives can be attained. The area of data warehousing is where many of the advances are being made in both legacy system and inter process integration as well. As data warehousing is often used to create a single, unified version of the truth in companies, they are also used for capturing the necessary data for strategic plans, programs and measuring the performance of companies as a result. BI, when used in data warehousing applications, can also serve as a strong competitive advantage as well. For any BI implementation to be successful, mission critical business processes must also be automated. The key lessons learned from using BI and DSS systems to enable greater competitive performance is the selection of the best possible business process to automate. After companies complete an extensive amount of analysis, many are finding that the (NPDI) processes, workflows and strategies have the greatest potential to benefit from BI and DSS platform support (Burkett, 2005). Using the concepts of BI applications including data mining, manufacturers are able to better understand the key success factors in creating new products. In conjunction with this finding is the insight that AMR Research has found in the adoption of BI for the new product development and introduction process in manufacturing companies who rely on distribution channels. A critical success factor of BI implementations is the ability to create a real-time analytics link between the demand management, channel management, production planning and production operations.

Another critical success factor can be seen regarding BI implementations and that is the need for accurately capturing the sales forecast and sales operations data in real-time so that manufacturing can react quickly and accurately to consumer demand. The S&OP process is
what makes supply chains get into synchronization with the demands of resellers and channel partners. All of the processes that interlink these areas of a company’s value chain require Key Performance Indicators (KPIs) and metrics of performance to evaluate ongoing performance by process area. The data delivered as part of the BI and DSS platforms are what make the S&OP processes of companies more efficient and capable of scaling to respond to variations in customer demand. BI systems are used first for integrating customer demand data into the S&OP process, and second, for analyzing the many factors and generating dashboards and scorecards that define the status of each strategy and the processes relied on. In short, BI’s many applications that interpret data from often dozens of databases to ultimately manage the value chain of an organization to the highest levels of efficiency possible. In the next section, the contributions of BI to value chain creation and performance are evaluate form the context of one of the more competitive industries, mass-market retailing.

3.4 Business Intelligence (BI) Key Success Factors in Value Chains

The value chain as a strategic framework (Porter, 1986) illustrates how data warehousing and BI can make significant contributions across enterprises. Increasing order velocity and accuracy is in fact revolutionizing entire industries (Johnson, 2009). As Porter defined the value chain network (1986) to compare the contributions at a cross-functional level of organizations, a key take-away emerges, and that is BI forces inter process system and process integration. BI acts as an enabler of integration across the primary and secondary or tertiary activities throughout the value chain framework.

The use of BI and DSS frameworks for enabling greater performance of value chains can also be seen in how the value chain for Wal-Mart has been transformed with analytics. Wal-Mart has transformed BI from a technology and set of applications used for analyzing past data to creating more effective means for differentiation through anticipating market shifts and market requirements. This has specifically been the case in China for example where Wal-Mart successfully entered a very difficult foreign market to gain traction in. Considering the fact that
Wal-Mart had stumbled in both Germany and South Korea, the launch strategy into China had much internal focus and intensity associated with it.

Wal-Mart realized that they had to get the launch and build-out of their channels in China right the first time, as it would take years of work with the Chinese government to gain the necessary approvals to build their stores. The launch strategy in China also necessitates that Wal-Mart completely reverse what it had become so good at in the United States, namely creating massive superstores in rural areas and ignoring opportunities in larger cities due to their supply chain and scalability expertise. Yet in China Wal-Mart had to completely reverse direction and seek to build out aggressively in urban and suburban markets including Shanghai and eventually Beijing. Wal-Mart was ultimately successful with their expansion into China as a direct result of relying on BI and data analytics to revolutionize their entire value chain, from the many new suppliers in China to the development of entirely new store concepts for the mass merchant. In analyzing why they were successful, critical success factors of BI implementations emerge from the analysis.

3.5 BI Critical Success Factors – The Case of Wal-Mart in China

Wal-Mart faced the challenge of using data warehouses and BI applications and tools that were more oriented to the U.S. market dynamics and market direction versus those of Asia. Realizing this, Wal-Mart immediately began to seek out joint venture partners and potential merger or acquisition candidates not necessarily to purchase them immediately, but for guidance and to gain access to market data. Wal-Mart immediately began to build out a BI and data warehouse ecosystem that would guide their efforts to penetrate the Chinese market.

Integral to the success of Wal-Mart in China was also the need to create real-time updates on sales-out data, or the tracking of sales from each of the pilot locations the company had been approved by the Chinese government to operate. Wal-Mart in the U.S. is extremely successful due to their exceptional focus on real-time data uploads, Extract, Transfer & Load (ETL) process expertise and the intensive use of pricing and elasticity analysis techniques where they can
know immediately what the demand curves are for each product and each category they sell. This level of insight is also what gives Wal-Mart exceptional bargaining and negotiating power with suppliers as well. All of the factors that contribute to Wal-Mart’s competitive strength and ability to turn their inventories over 8 times a year or more are predicated on real-time analytics and a very focused and customized BI platform and series of applications.

Wal-Mart’s BI system and its need for constant, real-time data illustrates an important critical success factor the company has, and that is the need for real-time data to fuel its value chain and sustain this competitive advantage.

What Wal-Mart did in China was to combine its use of BI applications and process expertise, real-time data from use of RFID throughout its supply chains in China, and uplink data in real-time to Bentonville, Arkansas through satellite links. In effect, Wal-Mart shows a best practice in BI deployment by creating a real-time information and knowledge ecosystem that is supported by BI and DSS system integration.

Wal-Mart was able to create this information ecosystem through the use of two enabling technologies, which included both Radio Frequency Identification (RFID) technology to manage warehouses and the use of satellite uplinks to get the data to their worldwide headquarters in Bentonville, Arkansas for analysis and interpretation (Luo, Yen, Tan, Ni, 2008). Of these two technologies, the Chinese government initially forbade them from using satellite uplinks, for fear of Wal-Mart being part of an elaborate spy network (Taylor, 2003).

Defining its supply chain in China from the context of speed of analysis and ability to capitalize on relationships with suppliers, Wal-Mart was able to quickly create economies of scale in their operations as a direct result of their strength with BI systems. Further, Wal-Mart had created an exceptionally effective ETL process with RFID in their warehouses and the use of daily uploads of data to their Bentonville, Arkansas headquarters for analysis. What transformed the Wal-Mart value chain however was its victory in gaining approval from the Chinese government for daily uplifts of sales-out data via satellite through their voice communications and internal teleconference network, or VSAT network (Sandelands, 1994). With the satellite feed of Chinese market data, Wal-Mart supply chain, procurement, revenue management and pricing
management executives have been able to better manage their contracts with Chinese suppliers for produces sourced for sale in the U.S. as well. The key lesson learned from a BI standpoint is that the development of an effective ecosystem for managing a very large, diverse supply chain requires real-time analytics and a scalable BI platform.

Another important point is that the integral role of data warehouses in the evolution of Wal-Mart in China, from their first store opening in the city of Shenzhen on August 12, 1996 to their growth today to 94 stores in 51 cities (Strategic Direction, 2008) all linked to the effectiveness of their BI applications and platforms.

Today, Wal-Mart relies on their VSAT network to ensure data is delivered to their corporate BI systems in real-time from each location globally. These uploads are used for updating supplier, pricing, quality management, service and store performance daily, in addition to defining the promotional and predictive analytics-based selling strategies the company will roll out through their stores in China as well. Wal-Mart is illustrating through example how a data warehouse, when strategically implemented, can deliver exceptional value over time. The use of the data warehouse for managing and optimizing the performance of all departments and divisions of an enterprise is being achieved in 2010 as a result. Wal-Mart has also found that using BI applications and their DSS framework, they can manage pricing and quality management data with the same level of accuracy in China that they do in the U.S.

With real-time data being sent every evening for analysis and interpretation, Wal-Mart has also been able to use Key Performance Indicators (KPIs) and dashboards to measure and optimize each link in their value chain. This has been particularly useful in China, where the build-out of operations has led to the development of entirely new business models for Wal-Mart. Known for their large supercenters in the U.S., in China Wal-Mart had to create more of a three-tiered strategy to gain market share (Taylor, 2003). In urban locations where Wal-Mart was exceptionally successful through Shanghai and Beijing for example, the reporting requirement forced role-based selling scenarios into their BI and DSS systems. These role-based approaches to managing store sales and store supply chain management led to per-store measures of performance and profitability – two measures that Wal-Mart’s culture celebrates and thrives.
Having these two aspects of store operations in place and reported in real time gave Wal-Mart store employees throughout China an opportunity to immediately get involved in the learning and store management programs offered internally. More importantly, BI systems and the insights gained gave Wal-Mart managers in China an opportunity to gain autonomy of their store operations, mastery of their roles managing them, and purpose in striving to compete on a global scale with their counterparts (Taylor, 2003). Figure 3, Wal-Mart Value Chain Analysis, China Specific illustrates how Wal-Mart was able to attain significant growth by using BI and DSS systems to strengthen their value chain.

### Figure 3: Wal-Mart Value Chain Analysis, China Specific

<table>
<thead>
<tr>
<th>Support Activities</th>
<th>Value Chain Analysis, China Specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm Infrastructure</td>
<td>Inferior fixtures standardization, Trucks, Average store size 84,000 square feet</td>
</tr>
<tr>
<td>Personnel Resource Management</td>
<td>Non-unionized, Full autonomy to associates, Decentralized, profit sharing program, Job rotation, Stock purchase plan</td>
</tr>
<tr>
<td>Technology Development</td>
<td>UPC at POS, EDI, Information system, VMI, Cross docking system, CPFR</td>
</tr>
<tr>
<td>Procurement</td>
<td>Maintain long-term relationship, No single supplier accounting for more than 2.4%, Selective suppliers (P&amp;G &amp; GE), NO nonsense policy</td>
</tr>
</tbody>
</table>

Analysis of Sources: (Strategic Direction, 2008, 7); (Luo, Yen, Tan, Ni, 2008, 17) (Mason, Ribera, Farris, Kirk, 2003, 141)

#### 3.6 Using BI in Customer Relationship Management (CRM) Strategies

Global recessions force companies to focus more intensely than ever on the profitable customer relationships they have. Difficult economic times also force companies to strive continually create more cost-effective, targeted and high-yield strategies to retain and grow their businesses. The data warehousing areas of BI and DSS platforms has become an indispensable part of these customer relationship management (CRM) strategies as a result. Given the urgent
need companies have to retain and grow their businesses in recessionary times, data warehousing is going through a transformation in these strategic areas of companies. One of the most significant developments in data warehousing specifically is the development of Master Data Management (MDM) repositories on which CRM systems, from Sales Force Automation to Business Intelligence and Predictive Analytics, can be based (Payton, Zahay, 2005). The creation of taxonomies that provide marketing, sales, customer service, product management and senior management with real-time updates on the impact of their strategies is also acting as a catalyst of MDM adoption as well. As was mentioned in the introduction of this paper, process-based analysis of workflows in companies is making apparent the need for tighter, more real-time integration of data warehouses and data marts more than ever before. This process-based use of data and information is over time generating knowledge which needs to be captured in data warehouses as well. The rapid adoption of MDM frameworks to support this knowledge capture and the ability to better manage strategies to results is having a significant impact on data warehouse platform development as well. Role-based and process-based taxonomies provide marketers with varying views of the same data and information, giving them insights into how best to define strategies and execute them. One of the strategic benefits of adopting data warehousing is in moving away from siloed data to a single system of record which can be used for supporting analyses of customer relationships and strategies on increasing retention and sales (Cunningham, Song, Chen, 2006).

For Continental Airlines who had suffered from exceptionally poor performance over time and was on the brink of bankruptcy due to lost customers and poor performance, the financial implications of a lack of data warehousing were painfully obvious. The airline embarked on an ambitious data warehousing initiative that had the strategic objective of unifying their many disconnected, siloed systems into a single warehouse that could in turn be used to better manage the airline. Figure 4, Continental Airline’s Data Warehouse provides an overview of their data architecture.
What differentiates the implementation by Continental Airlines of data warehousing relative to many others is the role-based, enterprise, and restricted views that are defined across the business users and applications. These views when combined with specific taxonomies which are critical for the airline to function, have given Continental the flexibility to create real-time business intelligence. Continental reports they have invested $30M in hardware, services, and data warehousing, business intelligence and data mining applications, generating a $500M return on this investment as a result of attaining real-time business intelligence (Watson, Wixom, Hoffer, 2006). In 1998 the airline achieved system and process integration between their customer information systems, customer relationship management (CRM), flight, finance, and security systems as part of its Go Forward strategic initiative. The initial results obtained provided insights into how Continental could optimize route selection, flight staffing, and marketing and promotion strategies to attain profitable levels of bookings on their flights.
Convincing by the positive results of Go Forward, Continental continued investing in business intelligence applications that would give them insights into constraint-based modeling to seek optimization-based pricing, staffing and service potential strategies to their most unprofitable routes. Continental began to invest more heavily into the areas of accounting and revenue management, customer experience management and the overarching CRM strategies, support for transaction security and scheduling and optimization of flight and crew scheduling and ground support operations (Watson, Wixom, Hoffer, 2006). When all five of these areas’ real-time business intelligence came online, Continental was more effective than any other airline at managing the latency of information to their advantage (Watson, Wixom, Hoffer, 2006). Data warehousing initiatives were the catalyst of Continental moving beyond system and process integration to focus more on real-time business intelligence. Their investments in data warehousing and business intelligence are credited with helping to turn the company around financially and keep it in business today based on a value assessment completed by the airline (Watson, Wixom, Hoffer, 2006). None of these benefits accrued without significant effort, the greatest being changing how many in the airline perceived the use of data and the many challenges of overcoming resistance to change. The greatest impediment to the success of any data-warehousing project is getting those most impacted by the process, procedural, data use, analysis and reporting to participate and take ownership versus resisting and even sabotaging change (Marks, Frolick, 2001). Continental’s senior management made it clear that without significant improvement to performance through data warehousing the firm would most likely go bankrupt. This set the tone of “we must win together” mindset that helped many in the airline overcome their resistance to change and make the data warehousing strategic initiatives succeed.

### 3.7 BI Lessons Learned in CRM Strategies

Data warehousing is now a competitive weapon used at the strategic level of companies looking to gain greater efficiencies from every area of their value chains. In recessionary economies the need for greater insights than ever into how to best serve customers is critical. The ability to
interpolate optimization strategies across flight crews, define financial implications of each flight in terms of break-even points, and the highly targeted marketing and promotional strategies to get the most profitable customers on specific flights is possible for Continental using data warehousing and real-time BI. The use of constraint-based modeling to create the most profitable strategies is critical for Continental as it is for nearly every other business today. The bottom line is that data warehousing is providing exceptional insights into critical business problems companies are facing that would otherwise not be able to overcome without these technologies and strategies.

3.8 Use Cases of Business Intelligence in Manufacturing

BI and DSS systems, when integrated into manufacturing process workflows, deliver inordinate levels of value that reverberate through an organization. The focus on this section of the literature review is how BI can significantly increase the value and product quality and manufacturing performance, two areas that lend themselves to quantification and ROI measures. BI and DSS systems alleviate the high levels of variability in sourcing and supply chain systems, and are increasingly becoming the foundation of the following process areas. These include non-compliance and corrective action, corrective action and preventative maintenance, document lifecycle management and supply chain audit management. Each of these strategies relies on BI and DSS systems to further provide insights and guide the development of new strategies and tactics to remain competitive. It is a common perception that BI in fact contributions much to marketing and sales, which is certainly the case. But the collection of BI and DS systems and applications contribute just as much too manufacturing quality management and keeping manufacturing strategies in synchronization with customer demand. The concept of being a demand-driven manufacturer that produces orders only to the forecasts of customers is predicated on the effective use of BI and DSS systems. These quality management strategies discussed are how many companies are finding they can translate BI and DSS-based market and competitive intelligence into a sustainable competitive advantage over time.
Non-compliance and corrective action – When a product is returned from a customer, often companies will only take the time to note the customers’ reason and not take the analysis further to determine underlying causes. There are companies that however use BI and DSS systems to analyze if a product failure is representative of a broader trend with suppliers, their extended supply chain, or the production process itself. BI’s predictive analytics components can be used for managing these strategies to ensure a high level of product quality. The use of BI and DSS is also critically important from the standpoint of measuring variability in the product quality over time. This is often referred to as Six Sigma, yet the underlying analytics and BI necessary to make this quality management strategy effective is also predicated on having the analytics applications well integrated into legacy systems as well. This is a critical point that makes the adoption of BI as a data strategy so effective. BI can leverage existing databases and make the entire operation more efficient by having making the most of the legacy data and intelligence from systems already in place in the company, some decades old. BI’s use in non-compliance and corrective action strategies is also predicated on how effective the strategies of customer management (CRM) and new product development are in defining the correct configurations to begin with. BI and DSS systems are used specifically in these areas as well, to streamline the overall development of high quality, durable products. This is a full-circle approach to designing products for quality, and BI and DSS platforms play a crucial role. Without BI, the new product development teams would not know if their designs were effective in creating new markets, and further, if the products were designed for a high level of manufacturing quality and performance. Overall, BI platforms and strategies unify the direction and focus of product strategies in many companies today and lead to greater levels of consistency in go-to-market strategies as a result. The need for companies to create a knowledgeable is also very apparent during this phase of any product’s evaluation over the long-term. Without BI applications and the database integration to legacy systems of record, the product planners and manufacturing teams would not know if the products’ intended use was being clearly communicated to customers. Further, these two critical teams would never know in what direction they should modify their products to be more effective and market-focused over the long-term. In this context, BI systems and applications bring the necessary
framework for ensuring that products stay in compliance to their design objectives. In the event a product or entire series of products or services begins to drift away from its intended result or target market, and as a result begins to break more and experience greater failure rates, analytics and dashboards will quickly reflect this fact. Analytics, BI and DSS systems are incredibly important to ensuring product quality and product design objectives are achieved.

**Corrective action and preventative maintenance** – Black & Decker is very well known for using BI and analytics for completing corrective and preventative action of defective product designs. The use of BI and analytics for determine the extent to which their products meet or exceed customer expectations is crucial for their ongoing growth and market share. The company also uses BI and DSS systems to determine costing and pricing for corrective action and preventative maintenance of their well-known machine tools and equipment. Corrective action and preventative maintenance is in fact a major source of innovation for companies as diverse as Apple Computer, Black & Decker to General Electric and Proctor & Gamble. All of these corporations rely on BI and DSS systems and platforms to enable greater levels of insight and analysis into how they can make their products more aligned to customer needs. The recursive nature of product development in these companies that does not vary from one product generation to the next is driven in large part from the BI and DSS systems and platforms in place. The key success factors or determinants of these BI systems’ performance are attributable to the highly integrated nature of DSS platforms and BI reporting. In effect, BI systems act as a catalyst of integration between legacy data, legacy processing and transaction systems, and most critical, business processes that are designed to more effectively serve the customer.

**Supply chain audit management** – This process are also illustrates the lessons learned from the interviews with industry experts which is a core part of the methodology of the thesis. Audit management of suppliers requires a scorecard that is stable enough to allow for trending over time on KPIs and metrics of performance, yet agile and flexible enough to allow for new measures of performance to be added over time. In effect, the developments of a balanced scorecard methodology for supply chain audit management across organizations can be closely
correlated to the level of profitability and new product introduction success over time (Hernandez, 2010).

BI and data warehousing specifically provide for the foundation of supply chain audit management to become more of a knowledge-generating function versus just a reporting one. Organizations in effect “learn” how to interpret and use information more effectively than if they had just relied on transaction counts or pricing alone. The use of BI and DSS platforms also allows companies to scale out their strategies and think more about how to enable greater role-based performance over staying in soloed, myopic organizational structures that limit growth. Figure 5, Impact of Role-based Business Intelligence on Enterprise Strategies illustrates how role-based BI can over time lead to greater levels of enterprise-wide collaboration and company-wide learning. Figure 5 also shows how over time BI-based systems and processes can actually increase the level of enterprise-wide performance in the core enterprise areas of accounting, distributed order management and logistics supply chain management. Finally this analysis indicates how BI can significantly increase the performance of back-office systems which further contribute to overall profitability and growth.

Figure 5: Impact of Role-based Business Intelligence on Enterprise Strategies

(Lamont, 2008)
### 3.9 The Measurable Effects of BI on Critical Business Processes

The quote-to-order process is critically important for many manufacturers, as quoting captures the requirements of a customer and communicates it back to a manufacturing organization. Often quoting systems will translate the quote directly into a Bill of Materials (BOM), which will allow the company to plan production and complete the necessary planning steps to build the product. Each of these steps shown in Figure 6, automating the Quoting Process with Business Intelligence, illustrates how badly in need of BI and analytics companies are in terms of their process workflows. Notice along the bottom of this workflow that it takes on average 20 days to complete just a quote for a new customized computer system used for managing telecommunications networks. The quoting process requires an intensive level of knowledge integration and the use of business analytics to increase its accuracy and performance.

![Figure 6: Automating the Quoting Process with Business Intelligence](AMR, 2005)

When BI and DSS systems are applied to this specific process area, the areas that require interprocess integration show the greatest gain from having
increased insight and intelligence available for people completing tasks. The development of entirely new ways of getting a quote completed often leads to increases in performance well over what could be done through manually driven redesigns. Adding in BI-based intelligence actually increases the performance of the process from days to literally hours.

Figure 7: Strategies for Streamlining the Quoting Process with Business Intelligence

The long-term effects of BI on the quote-to-order process are also seen in the structure of how sales channels mature, sales teams becoming more integrated to the knowledge creation process, and each department in the company moving quickly down the experience curve of their specific tasks. BI and the knowledge it creates becomes a unifier and accelerator of the
processes at the same time, creating an experience effect or in other terms, knowledge-based economies of scale.

BI’s long-term pay-off is in creating more efficiency throughout a complex business processes that in turn lead to greater production and profitability performance. BI can be the catalyst of a knowledge-based transformation of an enterprise if managed not as a singled-out strategy but as a strategic, overarching initiative that seeks to bring greater insight and intelligence into an organization. For lasting change to occur with any BI initiative, the CEO and other C-level executives must also internalize the need for change and also strive to create opportunities within the corporate culture for change to take hold and become part of the mainstream processes of an organization. Change management is the study of change within an organization, and implicit in its concepts and structure is the need for a trusted leader to define the direction and scope of just how much will be modified based on BI-based systems and insights gained.

Often organizations move into complex BI-based transformation models and do not stop to think about how they will transform their organizations from a distribution channel or supply chain perspective. The thinking in too many companies is about the short-term only, not the longer-term dependencies of their business model. The focus needs to be on the totality of the process and cultural change, not just on parts or segments of it. Leaders realize this who have vision, and who strive to create more effective approaches to using BI as the basis for completely re-ordering processes in their companies. The quote-to-order example, where the time to fulfill a quote shifted from days to hours, is a case in point. The impact on a company's competitive position as a result of being able to manage this shift in performance to such a great degree can mean the difference between their survival or not in highly turbulent industries including high tech and electronic components for example.
3.10 Analysis of the Research Questions after the Literature Review:

- **Why is it necessary to implement a BI system?**
  Business Intelligence is vital because markets are changing and they are becoming more complex day by day. New sets of consumers which were not present before are entering market continuously. So the taste, demand and expectations of the consumers are always evolving.

  If business organizations fail to understand their markets and consumers then they will probably fail to achieve their organizational business goals as well. The best way to gather these in depth information is by using intelligence services which highly rely on sophisticated technologies.

  Business Intelligence Systems are always the solution for the organizations in this case.

- **What are the key determinants of the success of Business Intelligence systems?**
  In order to implement a BI system successfully an organization has to take care of few matters. First of all it should not be considered as the total responsibility of the IT department as almost all the departments within an organization has something to contribute in BI process. Common definitions are needed to be created before approaching for a BI solution. The current BI stack and processes and organizational structures are also needed to be assessed. A preplan regarding how to store data is also required even before approaching any vendor.

  Understanding the users, thinking “actionable” and taking “baby steps” are also the major factors to be successful with the BI implementation.

  An organization also needs to decide very early of the planning phase whether to build or buy data mart for their system. Considering all the business Intelligence components choosing a good system integrator and starting with high value but simple business component are always the foundation of a successful BI system.

- **Whose responsibility is it to initiate and implement the BI system?**
  Initially it’s the responsibility of the top management to realize the need of such a system. The second phase requires them to consult about it with the IT consultants within the organizations.
The third phase should involve an open discussion between all the department managers of the firm. A separate board of members needs to be created from there on. But the key factor is to remember that when we talk about BI it means that the entire organization is someway responsible for a successful initiative and final implementation.

- **What is the impact of successful adoption of the BI system?**

More accuracy in decision making, an immediate rise in the profit of the entire business, greater customer satisfaction these are the most visible impact of a successful implementation. But it must be mention that it may take quite a few long before a firm can observe a huge change in numbers in all these areas. This completely varies from organization to organization. The managements in all the level of an organization will start to get a broader picture of their business processes that is for sure. As a result accountability will increase from day 1. In some cases a decrease in overall expenditure of a company can also be expected. Business and decision making processes will take less time and the overall pace of the company will increase as a result of the implementation.
Chapter 4: The Delphi Study

4.1 The Recommendations

At the beginning of the process all the experts were approached with a simple ‘RECOMMENDATION FORM’. (See the Appendix section for details)

The design of the form is such that it asks for each expert’s individual recommendation on what to do and what not to do in simple sentence in order to implement a successful business intelligence system in any organization. Experts were allowed to give as many recommendations as they could think of. Their recommendations were supposed to cover three time frames which are before, during and after implementation of the system. Three key aspects which were advised to consider during filling up the form were Technology, Management and Stakeholders.

The goal was to acquire as much information as possible from the expert’s personal experiences by doing a real brain storm.

In the second phase 13 short discussion questions (See the Appendix section for details) were developed by looking at the answers of the “RECOMMENDATION FORM” and the literature review of this paper.

The questions were formed in such ways that while answering them experts have to rethink about their suggestions in the recommendation form.

4.2 The Interviews

Two of the experts Participated in a face to face interview. They took their time and filled up the ‘Recommendation Form’ and talked about their thoughts and experience to justify their suggestions.
The 13 Questions were handled immediately after their answers were received and they were given enough time to prepare answers of those questions. In a few days another face to face interview were arranged where the experts discussed their answer of those 13 short questions.

Two of the other experts who were involved in this study participated the process through emails. It must be mentioned that these two experts took part in the study jointly. But again they followed the same order to answer while filling up the form and answering the questions.

After answering the short questions the experts were asked whether they want to modify their suggestions on the recommendation form or not.

When all the interviews were completed the answers of the experts were exchanged between each other in an anonymous way to observe whether they want to change their answers of the short questions or not.

This was done during the second phase of interview when the answers from the experts were received either verbally or via email. Whenever dissimilarity in an answer was found the expert was asked in depth to explain their answers through a discussion where views of other experts were shared.

During the process the interview answers were changed whenever it was required. The entire process can be visualized as the flow chart given on the next page.
Figure 8: The Delphi Approach followed during the study

Start

Fill Up the "Recommendation Form"

Answer the "Questionnaire"

Modification in the "Recommendation Form" Required?

Modify the "Recommendation form"

Discuss with the Interviewer

Modification in the "Questionnaire" Required?

Modify Answers in the Questionnaire

End
4.3 The Results and the Use of the Data

The suggestions provided by the experts in the recommendation form are attached in the Appendix section of this paper.

Their answers of the 13 short questions can also be found in the Appendix section.

These answers were used to modify the literature review of this study. While answering each of the research questions in the conclusion section the answers of the experts were reflected in a vigorous way.

As examples from the literature review we struggled sometimes to answer the following questions and had a very generalized answer. But the expert’s answer seems more accurate and reasonable thus helped us to state a better conclusion

How much can be improved of an organization’s business performance if we have all the business information and analytical tools we feel we need?

**We said:** More accuracy in decision making, an immediate rise in the profit of the entire business, greater customer satisfaction these are the most visible impact of a successful implementation. But it must be mention that it may take quite a few long before a firm can observe a huge change in numbers in all these areas. This completely varies from organization to organization.

**Exp1 said:** All functions and processes will be more efficient with good information and tools, how much depends on how bad the situation is today. To get value make sure that analysis and information is used in daily processes.

**Exp2 said:** It depends on from where you start. Obviously it always gets better.

If it has to be defined by number then I will say at least 10% increase in overall profit.
**Exp 3 said:** the entire scenario will be changed. The firm will have more control over their business.

A noticeable increase in profit is always the case.

**Modified Final Conclusion:** Improvement depends on from where the organization started and how well they are using the tools after the implementation stage. There will be at least 10% overall increase of profit in all the cases.

Does the attitude and interest of business leaders and CIO of a company towards BI systems have impact over success of a BI system in an organization? If yes how?

**We said:** Initially It’s the responsibility of the top management to realize the need of such a system.

**Exp 1 said:**- Yes, if the C-level is not involved the BI initiative will not work. The Business Leaders are much more important than the CIO. If the management is involved and understand the value of information and the work needed to get good information then the initiative may succeed.

**Exp 2 said:**- Yes. Initiatives have to be taken from the top. It will never work if push is needed from the bottom.

**Exp 3 said:**- Well yes definitely. If they have a big interest to see how the system is performing they will definitely push from the top which will accelerate the success of the deployment in the organization.

**Modified Final Conclusion:** Business leaders are the key initiative takers and hugely responsible for the total success of the BI system implementations. Their all time involvement and interest are required to make this process a total success.

In some cases the answers were different from our literature review. On the other hand lots of similarities were also found. The later is a sign that the literature review we did before indeed makes sense.
The patterns in the expert’s answers are a clear indication that the study was able to filter the thoughts of the experts successfully. But it must be mentioned that in some cases some of the experts gave so much preference on the technical issues where as some of them stuck with the managerial aspect of the field. This is due to the fact that experts reflected their own expertise. As an example if an expert was involved in his career with the technical aspect of BI systems then his answers are more technical rather than management related issues.

**Chapter 5: Conclusion**

BI needs to become more than just a series of technologies that are rolled out throughout an organization, or a series of systems relied on to resolve a lack of knowledge generation or knowledge sharing. Instead, BI needs to be a catalyst of information exchange and the development of knowledge within an organization. BI initiatives however cannot be made in the context of short-term, “fix the sales problem or customer problem” mindset. Instead, the focus needs to be on a systemic, complete change to the development of a strategy where knowledge, not necessarily price, promotion, or even distribution channels become the core focus of the initiative. As the examples from Wal-Mart and Continental Airlines indicate, BI can be a powerful change agent in supply chain centric businesses, and those services businesses that rely extensively on customer knowledge on the service provider side, and customer delight on the user experience one. The development of the supply chain in Wal-Mart China is a case in point. Without the real-time analytics and the ability to effectively manage change while appeasing the Chinese government, Wal-Mart would have failed in China. Instead, they were able to attack the most critical area of their business model in China first, and that was creating a strong ecosystem of real-time analytics and BI. The factors that led to the success of Wal-Mart can be attributed to many factors, but the most prevalent ones is the ability to quickly interpret market conditions, capture those conditions and quantify them into metrics. Once this was accomplished, pre-emptive supply chain, sourcing, and distribution channel decisions could be completed. Without it, Wal-Mart would have been reduced to manual processes, often full of errors, and having to contend with a knowledge transfer challenge in a non-native language.
Finally in the case of Continental Airlines, the use of the systems in place prior to BI and data warehousing typified all that was wrong with this service-intensive industry. The development of programs for first understanding the customer, and second, anticipating their requirements and acting on them, was crucial to the survival of the airlines. Instead of concentrating purely on price, Continental focused on using analytics to drive a more effective user experience over time. The end result was a significant gain in customer retention and the development of more effective strategies for dealing with customer complaints as well.

5.1 Final Analysis of the Research Questions

The following is an analysis of each of the research questions asked in the study.

- **Why is it necessary to implement a BI system?**
  The research completed indicated that BI is critically important to unify the strategies across a value chain. From the expert interviews it is clear that BI acts as an accelerator, making processes more efficient and focused over time. BI can also lead to greater levels of strategy focus and clarification as iterations are completed. The role of BI across functional areas, not just within silos, became apparent from the research as a critical prerequisite for attaining a higher ROI from investments in these technologies. The integration of BI into critical customer-facing processes was also evaluated and shown to be more effective in streamlining complex selling cycles than using a product or services catalog alone.

- **What are the key determinants of the success of Business Intelligence systems?**
  There are many key determinants of success for BI systems, the most critical being the endorsement of the system from senior management. This is absolutely essential because the entire organization will only believe in a system to the extent senior management endorses it. Overcoming resistance to change is critical for any BI initiative to succeed. A second key determinant of success for BI systems that emerged from the analysis was the aligning of BI technologies to business processes that needed greater insight to excel. The focus on how to transform knowledge into a competitive asset is the focus on this second attribute. Being able to generate higher levels of ROI based on using data more effectively is critically important. A
third critical determinant of success for BI systems is the integration of back-end systems and processes to enable greater levels of reporting flexibility. Often systems cannot be integrated together well, and this is where the reporting aspects of BI often fail. The level of integration expertise is critical for the success of an entire system. Finally, the use of the right metrics or key performance Indicators (KPIs) is essential. Having the best possible series of metrics and being able to create a more effective dashboard than competitors in a given market can transform BI into a competitive asset over time.

- **Whose responsibility is it to initiate and implement the BI system?**
  Ultimately, it is the CEO and senior managers of a company who are responsible for the successful execution of a BI strategy. Overcoming resistance to change begins when a company can effectively focus on their strategies, have leaders who can navigate them successfully, and transform knowledge into a competitive strength. The managers and leaders of business units are those that are ultimately responsible for the success of a BI system as well. These managers must choose the best possible metrics and KPIs to measure to guide their businesses over the long-term.

- **What is the impact of successful adoption of the BI system?**
  As the body of research indicates in this analysis, the greater the level of BI and analytics integration, the greater the extent to which an organization can transform its business processes and be more competitive. The impact on the quote-to-order is very significant, trimming days off the process and making it much more competitive as a result. The secondary effects of this are that the organizations who integration BI and analytics into their workflows are more agile in responding to the needs of the market. The examples from Black & Decker and others who use analytics to drive greater customer responsiveness in product design evidence this. BI then acts as both a process enabler and accelerator, in addition to delivering insights and useful data on the direction and duration of trends impacting the market and companies. BI ultimately needs to be a system of record in organizations to ensure that it stays competitive with the market over time.
The focus of this thesis has been on the adoption of BI and analytics throughout organizations who need market intelligence to continually improve their operations and make them more efficient. The needs of organizations for greater support of process-based intelligence are also driving the adoption of BI in selling cycles specifically. This has been seen in the context of the quote-to-order and mass customization processes shown in this study. Ultimately BI and analytics need to concentrate on how to keep an organization in touch with its market and the needs of its customers, while keeping a focused strategy on growth. BI and analytics as a system of record show potential to create more consistent and unified strategies across organizations.
References


**Recommendation Form**

**Recommendations for the implementation of a Business Intelligence system in an organization**

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Questions

1. How much can be improved of an organization’s business performance if we have all the business information and analytical tools we feel we need?

2. How long does it usually take to see the full effect of decision support system in an organization after successful deployment?

3. Does it require major change in the existing IT infrastructure of the organization? If yes does the investment worth it?

4. Do business executives and managers find it difficult/Uncomfortable in the beginning to use analytical tools for the purpose of decision making? If yes can you please mention one common scenario?

5. What kind of pre plans are needed to be made in order to provide BI tool training to business users so that they know the exact purpose and usability of the deployed BI system?

6. Who are the possible business unit stakeholders whom are going to gain or lose power when the BI system will be deployed in the organization?

7. Who are the possible early adopters in an organization whom can speed up acceptance of the newly deployed BI system?

8. Name few odds which may come on the way of an organization after deploying a BI system.
9. What kind of initiative should management take to cope with newly deployed decision support system and sudden change in the business process?

10. Do the attitude and interest of business leaders and CIO of a company towards BI systems have impact over success of a BI system in an organization? If yes how?

11. Name few key IT assets which are pre requisites before adopting Decision Support System in a company.

12. What are some examples of how BI can improve CRM, Marketing and Channel management?

13. Mention some of the common mistakes which companies make before taking BI initiatives and after deploying a BI system.
**Expert 1’s Recommendations**

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<td>1. Understand the business</td>
<td>1. Focus on products and technical issues</td>
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<td>2. Define business term per business process</td>
<td>2. Start with source systems and build the DW from those</td>
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<td>3. Find the right business process to start with, high value, easy to do</td>
<td>3. Start with a 3nf model</td>
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<td>4. Establish a way to work with BI both on business and IT side</td>
<td>4. Start without management support</td>
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<td>5. Attend to data quality and MDM process</td>
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<td><strong>During Implementation</strong></td>
<td>1. Work in short iterations (max 3 months)</td>
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<td>2. Have a constant involvement from the business side</td>
<td>2. Isolate the project, and project members, from user contact</td>
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<td>3. Use standard tools and practices (star schema)</td>
<td>3. Stick to outdated plans and needs</td>
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<td>4. Cleat roles in the project</td>
<td>4. Forget about the CONTENT, the data</td>
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<td>5. Reprioritize</td>
<td>5. forget do document as you work</td>
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### Expert 1’s Answers

1. How much can be improved of an organization’s business performance if we have all the business information and analytical tools we feel we need?
   - All functions and processes will be more efficient with good information and tools, how much depends on how bad the situation is today. To get value make sure that analysis and information is used in daily processes.

2. How long does it usually take to see the full effect of decision support system in an organization after successful deployment?
   - A few months, sometimes sooner depending on the need and the fit of the solution. This is for ONE process. To just get better financial reporting does seldom give more value than saved time.

3. Does it require major change in the existing IT infrastructure of the organization? If yes does the investment worth it?
- NO, It is tools, BI is information. Very seldom there is change in the existing IT infrastructure, the DW/BI system is a new system dependent on the old ones. In a good solution, that includes MDM, BI/MDM will make the existing infrastructure better.

4. Do business executives and managers find it difficult/Uncomfortable in the beginning to use analytical tools for the purpose of decision making? If yes can you please mention one common scenario?
   - Executives and managers should probably NOT use analytical tools. They should have easy to use dashboard like system with limited analytical capabilities. If they can get the FACTS of daily business that is often a HUGE improvement. TO give management access to raw cubes or statistical functions often gives more frustration than anything else. Make sure to give executives and managers the facts they need and analysis done by skilled analytics.

5. What kind of pre plans are needed to be made in order to provide BI tool training to business users so that they know the exact purpose and usability of the deployed BI system?
   - Make sure that the tool solves a perceived problem and/or gives high business value. The tool should be deployed so that no training more than 2-3 hours is needed. Often a training 1-3 hours of business term and logic is needed but that is not tool related. If you need to explain the purpose of the system it would be likely that you have not understood the user’s needs.

6. Who are the possible business unit stakeholders whom are going to gain or lose power when the BI system will be deployed in the organization?
   - The ones crating manual reports will no longer be the only one who know what “discounts” needs or how “margin” is calculated, they will perhaps feel that they lose “power”.

7. Who are the possible early adopters in an organization whom can speed up acceptance of the newly deployed BI system?
   - Salespersons that can use BI systems to better deals. Very seldom finance.

8. Name few odds which may come on the way of an organization after deploying a BI system.

9. What kind of initiative should management take to cope with newly deployed decision support system
and sudden change in the business process?
- The system should SUPPORT processes and facilitate an agile organization. The only sudden change should be that they get good information.

10. Do the attitude and interest of business leaders and CIO of a company towards BI systems have impact over success of a BI system in an organization? If yes how?
- Yes, if the C-level is not involved the BI initiative will not work. The Business Leaders are much more important than the CIO. If the management is involved and understand the value of information and the work needed to get good information then the initiative may succeed.

11. Name few key IT assets which are pre requisites before adopting Decision Support System in a company.
- Knowledge about business processes and source systems. GOOD documentation of existing systems.

12. What are some examples of how BI can improve CRM, Marketing and Channel management?
- More sales, better campaigns, knowledge about channel performance and profitability. CRM is closely connected to having good data quality, marketing needs more information than is available in internal systems, that data I channeled via the DW. They have facts around channel profitability is vital in discussion around strategy.

13. Mention some of the common mistakes which companies make before taking BI initiatives and after deploying a BI system.
- The think of BI as an IT problem, concentrate on tool evaluation and don’t understand business before starting this means that no one will use the system. The BI needs to fit into business process and should solve perceived problems. If the solution is to just give users a reporting and analysis tool the deployment will fail.
## Expert 2’s Recommendations

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<thead>
<tr>
<th>Actions</th>
<th>Do’s</th>
<th>Don’ts</th>
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<tbody>
<tr>
<td></td>
<td>2. What are my needs? Analytics, or just numbers.</td>
<td>2. Don’t just pick the cheapest one.</td>
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<td></td>
<td>3. Is it possible I want to grow, later on?</td>
<td>3. Don’t just focus on the needs now, but look into the future. What will we need after 3 years?</td>
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<td>5. Ask for RFO</td>
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<td>6. Do I need new databases, ETL tools….</td>
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<td><strong>During Implementation</strong></td>
<td>1. Train staff. Important</td>
<td>1. Keep bad data. Make sure it is filtered out at the ETL stage.</td>
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<td>2. Conduct pilot if necessary</td>
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<td>3. Need to hire more staff?</td>
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<td>4. Need string project management</td>
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</table>
Expert 2’s Answers

1. How much can be improved of an organization’s business performance if we have all the business information and analytical tools we feel we need?
   
   Ans: It depends on from where you start. Obviously it always gets better.
   
   If it has to be defined by number then I will say at least 10% increase in overall profit.

2. How long does it usually take to see the full effect of decision support system in an organization after successful deployment?
   
   Ans: minimum a year.

3. Does it require major change in the existing IT infrastructure of the organization? If yes does the investment worth it?
   
   Ans: Well yes if it’s started from the scratch. Definitely worth it.

4. Do business executives and managers find it difficult/Uncomfortable in the beginning to use analytical tools for the purpose of decision making? If yes can you please mention one common scenario?
Executive managers often find it uncomfortable in the beginning as they won't be able to hide anything anymore from the top management.

5.
What kind of pre plans are needed to be made in order to provide BI tool training to business users so that they know the exact purpose and usability of the deployed BI system?
Ans: Training plans are definitely needed. Technical training and how to use the results. Basic understanding of the data is something every operator within the firm must have.

6.
Who are the possible business unit stakeholders whom are going to gain or lose power when the BI system will be deployed in the organization?
Ans: Gain power---- top management, investitures.
Loss of power-----middle management because of increase in transparency..

7.
Who are the possible early adopters in an organization whom can speed up acceptance of the newly deployed BI system?
Ans: Business and economic controllers.

8.
Name few odds which may come on the way of an organization after deploying a BI system.
Ans: Poor data quality, it can cause loosing trust in the system.....ownership and the responsibility,
governance, maintenance and support have to be clear and defined.
Not been able to handle new business needs.

9.
What kind of initiative should management take to cope with newly deployed decision support system and sudden change in the business process?
Ans: They should have a clear idea of responsibility and ownership. There must be a clear process to take care of new business needs as well.

10.
Do the attitude and interest of business leaders and CIO of a company towards BI systems have impact over success of a BI system in an organization? If yes how?
Ans: yes. Initiatives have to be taken from the top. It will never work if push is needed from the bottom.
11. Name few key IT assets which are pre requisites before adopting Decision Support System in a company.
   Ans: should be able to ensure Great data quality while gathering data, a good IT strategy.

12. What are some examples of how BI can improve CRM, Marketing and Channel management?
   Ans: predictive analysis to predict the behavior of customer, segmentation of customer with high
        accuracy, help to retain customer attention. Another example is revenue dynamics.

13. Mention some of the common mistakes which companies make before taking BI initiatives and after
    deploying a BI system.
   Ans: before---not been able to make work management people, IT people and stakeholders
        all together. Underestimating time and resources.
        After---wrong distribution of ownership and responsibility. Putting all the responsibility
        on the IT department.
# Expert 3’s Recommendations

<table>
<thead>
<tr>
<th>Actions</th>
<th>Do’s</th>
<th>Don’ts</th>
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| Before Implementation | 1. Define the Business Drivers for BI  
2. Start with a clear BI strategy - defining Business value of BI.  
3. Assess the BI maturity of the organization  
4. Make sure to prioritize and align different BI initiatives with the overall Business Strategy, goals and objectives  
5. Make sure to have an agreed Governance and management structure for BI – with a clear decision rights and accountability framework. Who owns BI in the organization?  
6. Conduct a business requirement analysis  
7. Design an appropriate BI architecture and select a technical solution/platform based on the business requirements and the IT strategy.  
8. Define the difference between Strategic, Tactical and operational BI | 1. Don’t start with a technical solution  
2. Don’t start with the answer before you know the questions .  
3. Don’t look upon BI as an question for the IT Department  
4. Don’t think that BI will create business value by chance- don’t skip the business case | 5. |
| During Implementation | 1. Make sure to follow the roadmap built from a GAP analysis based on a business analysis and the BI strategy  
2. Realize the BI solution in increments according to the BI Strategy and target architecture.  
3. If possible, start with “low hanging fruits” to be able to show real results and value for end users rather quickly during the implementation  
4. Make sure to balance the investments in infrastructure, architecture, connecting source systems and delivering functionality for the end users.  
5. Make sure to have a clear and well defined process for transition, acceptance test and handing over to maintenance. | 1. Don’t lock yourself in for six month before you present any results from the development.  
2. Don’t forget to validate the added value to the organization for every realized increment. | 3.  
4.  
5. |
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<th>After Implementation</th>
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<tr>
<td>1. Make sure to have a well defined process and organization for Information Delivery Management – responsible for development of information products to the organization and for the content and quality of the information products</td>
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<tr>
<td>2. Make sure to have a well defined process for and function for Data Resource Management – responsible for translating data sources in to data warehouse models, and evaluating the delivery of data from different source systems.</td>
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<tr>
<td>3. Make sure to have a well defined process and organization for Maintenance and Support – responsible for daily operations and maintenance functions for the BI solution. Securing continuity, stability and availability of the BI environment.</td>
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<tbody>
<tr>
<td>1. Don’t leave the full responsibility and ownership for the total BI solution to the IT department.</td>
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<tr>
<td>2. Don’t forget the differences between the objectives for exploitation and development – stability v s adding new value to the BI solution</td>
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<tr>
<td>3. Don’t forget to handle the balance between “run” and “change”</td>
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Expert 3’s Answers

1. How much can be improved of an organization’s business performance if we have all the business information and analytical tools we feel we need?
   Ans: The entire scenario will be changed. The firm will have more control over their business. A noticeable increase in profit is always the case.

2. How long does it usually take to see the full effect of decision support system in an organization after successful deployment?
   Ans: The result will start to show very fast. Though to get the bigger picture we may have to wait a year.

3. Does it require major change in the existing IT infrastructure of the organization? If yes does the investment worth it?
   Ans: Yes if the firm is not already equipped with BI infrastructures. In the beginning the investment may seems little bit high but in couple of years the company will start to get the big gains.

4. Do business executives and managers find it difficult/Uncomfortable in the beginning to use analytical tools for the purpose of decision making? If yes can you please mention one common scenario?
   Ans: Almost always. Unless they have already used BI Systems before. Management often starts to rely on IT departments and put pressure on them to perform their tasks.

5. What kind of pre plans are needed to be made in order to provide BI tool training to business users so that they know the exact purpose and usability of the deployed BI system?
   Ans: All the employees who are going to use the system must be aware of the purpose and the process. They need to attend seminars and lectures to understand completely whose responsibility is what. Technical training to operate the system is also a must.

6. Who are the possible business unit stakeholders whom are going to gain or lose power when the BI system will be deployed in the organization?
Ans: top management and the top decision makers will definitely have more control, people in the middle of the organization will lose power.

7.
Who are the possible early adopters in an organization whom can speed up acceptance of the newly deployed BI system?
   Ans: people who work within the IT department and of course people who played a key role during taking the BI initiative in the company.

8.
Name few odds which may come on the way of an organization after deploying a BI system.
   Ans: lack of coordination between departments, relying too much on IT people. Not understanding that to be successful everyone has to work together.

9.
What kind of initiative should management take to cope with newly deployed decision support system and sudden change in the business process?
   Ans: making everyone in the firm aware of their responsibility and to take care that there is good communication between all the departments.

10. 
Do the attitude and interest of business leaders and CIO of a company towards BI systems have impact over success of a BI system in an organization? If yes how?
   Ans: Well yes definitely. If they have a big interest to see how the system is performing they will definitely push from the top which will accelerate the success of the deployment in the organization.

11. 
Name few key IT assets which are pre requisites before adopting Decision Support System in a company.
   Ans: To have a Basic IT infrastructure, IT strategy and some truly IT educated people.

12. 
What are some examples of how BI can improve CRM, Marketing and Channel management?
   Ans: Using BI system it is possible to predict customer behavior, it is possible to know which marketing strategy is working in which way. Overall by analyzing these factors a business firm can reconstruct their strategy every time.
13.
Mention some of the common mistakes which companies make before taking BI initiatives and after deploying a BI system.

Ans: Before- trying to implement BI System by their own or finding cheap solutions, not thinking that things can get complicated in the future.
After: Not performing maintenance tasks regularly. Not arranging internal meetings between different departments in the organizations to identify problems or business needs.