Organizational Applications of Business Intelligence Management: Emerging Trends

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Preface

Section 1
Organizational Issues

Chapter 1
Business Intelligence and Organizational Decisions
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The focus on transactional systems in the earlier decades of information management is beginning to shift toward decisions. In order to study the relationship between information and decisions, the author interviewed 32 managers in 27 organizations where an attempt to use information to support decision-making had been made. A framework involving three different relationships between information and decisions is introduced: loosely-coupled, structured human, and automated. It is suggested that loosely-coupled information and decision environments, while productive for information providers, may require too much knowledge on the part of information users to be effective. A four-step process for bringing information and decisions in closer alignment is also advanced.

Chapter 2
Business Plus Intelligence Plus Technology Equals Business Intelligence
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In this article the authors will show how the parallel developments of information technology at the operational business level and decision support concepts progressed through the decades of the twentieth century with only minimal success at strategic application. They will posit that the twin technological developments of the world-wide-web and very inexpensive mass storage provided the environment to facilitate the convergence of business operations and decision support into the strategic application of business intelligence.
Chapter 3
Business Intelligence in the Bayou: Recovering Costs in the Wake of Hurricane Katrina

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During the 2005 Atlantic hurricane season, Hurricane Katrina wreaked havoc on New Orleans. Significant damage to the Gulf region forced the Federal Emergency Management Agency (FEMA) to begin an unprecedented cleanup effort. The removal and disposal of debris was not only a challenge for landfill capacity but also for the administration of drivers, trucks, and debris type. With the debris removal workforce and certified hauling vehicles changing rapidly, record keeping and fraud detection proved difficult. This paper introduces the results of a data driven manpower audit for one parish in the greater New Orleans area that consolidated records and reconciled multiple record keeping systems. The authors' findings bring to light the failings in record keeping during this disaster and highlight how a simple business intelligence application can improve the accuracy and quality of data and save costs.

Chapter 4
The Role of Culture in Business Intelligence

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Global business intelligence will struggle to live up to its potential if it fails to take into account, and accurately interpret, cultural differences. This paper supports this assertion by considering the concept of culture, explaining its importance in the business intelligence process, especially in foreign markets, and demonstrating that attention to culture is currently inadequate in most international business intelligence efforts. Without a tool capable of modeling social interaction in disparate cultures, BI efforts will under perform when extended to the global arena. The Cultural Simulation Modeler is examined as a means of enhancing essential cultural awareness. The core components of the modeler are explained, as are the limitations of automated information gathering and analysis systems.

Chapter 5
What is Business Intelligence?

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There has been growing corporate interest in business intelligence (BI) as a path to reduced costs, improved service quality, and better decision-making processes. However, while BI has existed for years, it has difficulties reaching what specialists in the field consider its full potential. In this paper, the authors examine disparities in how the constructs of business intelligence are defined and understood, which may impede an understanding of what BI represents to business leaders and researchers. The main objective of this study is to clearly understand this emerging concept of BI. In this regard, the authors analyze articles from the scientific and professional literature to have a comprehensive understanding of business intelligence as both a product and a process. This research proposes a global overview of the conceptual foundations of BI, which can help companies understand their BI initiative and leverage them to the strategic level.
Chapter 6
The Importance of Process Thinking in Business Intelligence

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The growing field of Operational Business Intelligence (BI) has resulted in increasing interest in BI-supported Business Processes (BPs), including their management and ongoing improvement. This has led BI practitioners to consider another field—Business Process Management (BPM)—that is closely related to business performance management. However, current approaches to the BPM and operational BI integration have been limited and reduced to the problem of technical integration of BPM and BI systems. This paper argues that by adopting process thinking in BI, further opportunities for business value creation could be discovered through systematic analysis of the non-technical aspects of BI and BPM integration, including strategy alignment, human-centered knowledge management, and ongoing improvement of BI supported processes. The authors propose a theoretical framework founded in the related research in BPM, BI, and Knowledge Management (KM) fields, describing the ways it has been used to guide ongoing empirical research in diverse case organizations across different industry sectors.

Section 2
Analytic Issues

Chapter 7
Strategies for Document Management

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Keyword search has failed to adequately meet the needs of enterprise users. This is largely due to the size of document stores, the distribution of word frequencies, and the indeterminate nature of languages. The authors argue a different approach needs to be taken, and draw on the successes of dimensional data modeling and subject indexing to propose a solution. They test our solution by performing search queries on a large research database. By incorporating readily available subject indexes into the search process, they obtain order of magnitude improvements in the performance of search queries. Their performance measure is the ratio of the number of documents returned without using subject indexes to the number of documents returned when subject indexes are used. The authors explain why the observed tenfold improvement in search performance on our research database can be expected to occur for searches on a wide variety of enterprise document stores.

Chapter 8
The Current State of Analytics in the Corporation: The View from Industry Leaders

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Business intelligence and analytics in general are currently experiencing a resurgence in interest from both the business and academic communities. As a response, a Business Analytics Special Interest Group (SIG) was formed at Villanova University in 2007 to better link these two communities and support the growing needs of business. As a multi-disciplinary group composed of both analytics professionals and academics, one of the first tasks was to investigate how businesses viewed analytics and how they were incorporating them in actual practice. With this in mind, an interview questionnaire was developed and senior-level executives from a diverse group of sixteen different firms were interviewed in a group context. Their responses led to the development of a new, integrated analytics curriculum and the establishment of a new Analytics Round Table. The results from this series of semi-structured interviews are presented in this paper.

Chapter 9
Application of Triplet Notation and Dynamic Programming to Single-Line, Multi-Product Dairy Production Scheduling ................................................................. 121
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The application of optimal methods for production scheduling in the dairy industry has been limited. Within supply chain terminology, dairy production was generally considered a push process but with advancements in automation, the industry is slowly transforming to a pull process. In this paper, the authors present triplet notation applied to the production scheduling of a single production line used for milk, juice, and carnival drinks. Once production and cleaning cycles are characterized as triplets, the problem is formulated. Lagrange relaxation is applied and the final solution is generated using dynamic programming.

Chapter 10
Data Mining for Health Care Professionals: MBA Course Projects Resulting in Hospital Improvements....................................................................................... 133
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In this paper, the authors discuss a data mining course that was offered for a cohort of health care professionals employed by a hospital consortium as an elective in a synchronous online MBA program. The students learned to use data mining to analyze data on two platforms, Enterprise Miner, SAS (2008) and XLMiner (an EXCEL add-in). The final assignment for the semester was for the students to analyze a data set from their place of employment. This paper describes the projects and resulting benefits to the companies for which the students worked.

Chapter 11
Data-Driven Decision Making for New Drugs: A Collaborative Learning Experience .................. 144
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Two courses, advanced decision-making and pharmaceutical marketing, were combined in a collaborative process to mimic how the pharmaceutical industry determines the potential of new drugs. Integrated student teams worked together to complete semester-long projects and taught each other their respective knowledge areas—marketing and statistics. Real-world data for medical and pharmacy claims payments were “cleaned” and mined by students to analyze usage and cost patterns for anti-hypertensive
and anti-hypercholesterolemia drugs currently on the market. Analyses included merging the medical and pharmaceutical data records to derive individual electronic patient records, which were the basis of financial projections for the new drugs. Importantly, the single patient record is congruent with the needs of the stakeholders currently working to reform U.S. healthcare delivery.

Chapter 12
Towards Private-Public Research Partnerships Combining Rigor and Relevance in DWH/BI Research: The Competence Center Approach
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Business intelligence (BI) and data warehousing (DWH) research represent two increasingly popular, but still emerging fields in the information systems (IS) academic discipline. As such, they raise two substantial questions: Firstly, “how rigorous, i.e., fundamental, constituent, and explanatory, is DWH BI research?” and, secondly, “how relevant, i.e., useful and purposeful, is this research to practitioners?” In this article, the authors uphold the position that relevance and rigor are by no means dichotomous, but two sides of the same coin. Naturally, this requires well-defined approaches and guidelines—for scholarship in general and DWH/BI research in particular. Therefore, this paper proposes the competence center (CC) approach—a private-public partnership between academia and practice. The authors illustrate how the CC approach can be applied within the field of DWH/BI and suggest that a close link between research and practice supports both enhancing relevance to practice and strengthening rigor of research.

Chapter 13
Improving Business Intelligence: The Six Sigma Way
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Business Intelligence has never been examined with the same rigor as demanded for any other organization investments. Although global investment in Business Intelligence has reached over 6 billion dollars, business managers continue to follow tradition and leave the management of business intelligence to the technocrats. In this paper, the author proposes that a critical need exists to apply the same six sigma methods, which have worked for the rest of the organization to business intelligence operations and products. This proven structured approach, including the associated rigor and metrics, can be customized and integrated into a program which will allow effective management of business intelligence. The proposed Six Sigma program for business intelligence will ensure that an organization can gain control, improve understanding of operations and products, and improve the value of this crucial organization investment.

Section 3
Technology Issues

Chapter 14
The BI-Based Organization
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Business intelligence (BI) is an umbrella term that is commonly used to describe the technologies, applications, and processes for gathering, storing, accessing, and analyzing data to help users make better decisions. For BI-based firms, BI is a prerequisite for competing in the marketplace. Though there are
several possible BI targets, it is important to understand how they differ in terms of strategic vision, level of sponsorship, required resources, impact on people and processes, and benefits. Some companies like Harrah’s Entertainment, Continental Airlines, Norfolk Southern, and Blue Cross and Blue Shield of North Carolina are exemplars of BI best practices. Despite the progress made with BI, there are still many opportunities for academic research.

Chapter 15
Do Users Go Both Ways? BI User Profiles Fit BI Tools

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A challenging task for a data warehouse team is identifying users by their information needs and skills, and then providing the BI (Business Intelligence) tools that support each group to do their job effectively and efficiently. Recent studies have shown that the BI market place is saturated with a bewildering array of capabilities, functions and software suites. The current lack of consistent interpretation of Business Intelligence has created some confusion in the market place. This paper defines a framework to identify different user groups in an organization and map their needs and requirements to the different functionalities offered by different BI tool vendors. Through literature review, clear definitions of users were created and a set of BI tools that identifies functional needs was established. From that information, a questionnaire was developed that probed for the relationships between user types, tools, functions and other perceived values. Responses from 154 professionals were then used to develop a road map for the data warehouse project team in BI tool selection.

Chapter 16
Enterprise Information System and Data Mining

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The advent of information technology and the consequent proliferation of information systems have lead to generation of vast amounts of data, both within the organization and across its supply chain. Enterprise information systems (EIS) have added to organizational complexity, and at the same time, created opportunities for enhancing its competitive advantage by utilizing this data for business intelligence purposes. Various data mining tools have been used to gain a competitive edge through these large data bases. In this paper, the authors discuss EIS-aided business intelligence and data mining as applicable to organizational functions, such as supply chain management (SCM), marketing, and customer relationship management (CRM) in the context of EIS.

Chapter 17
Historical Data Analysis through Data Mining from an Outsourcing Perspective:
The Three-Phases Model

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The process of historical data analysis through data mining has proven valuable for the industrial environment. There are many models available that describe the in-house process of data mining. However, many companies either do not have in-house skills or do not wish to invest in performing in-house data mining. This paper investigates the applicability of two well-established data mining process models in an outsourcing context. The authors observe that both models cannot properly accommodate several key aspects in this context; therefore, this paper proposes the Three-phases method, which consists of data retrieval, data mining and results implementation within an organization. Each element is presented as a visual method fragment, and the model is validated through expert interviews and an extensive case study at a large Dutch staffing company. Both validation techniques substantiate the authors’ claim that the Three-phases model accurately describes the data mining process from an outsourcing perspective.

Chapter 18
Data Warehousing Requirements Collection and Definition: Analysis of a Failure
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Defining data warehouse requirements is widely recognized as one of the most important steps in the larger data warehouse system development process. This paper examines the potential risks and pitfalls within the data warehouse requirement collection and definition process. A real scenario of a large-scale data warehouse implementation is given, and details of this project, which ultimately failed due to inadequate requirement collection and definition process, are described. The presented case underscores and illustrates the impact of the requirement collection and definition process on the data warehouse implementation, while the case is analyzed within the context of the existing approaches, methodologies, and best practices for prevention and avoidance of typical data warehouse requirement errors and oversights.

Chapter 19
Business Intelligence 2.0: The eXtensible Markup Language as Strategic Enabler
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Business Intelligence 2.0 is an umbrella term used to refer to a collection of tools that help organizations extend their BI capabilities using Internet platforms. BI 2.0 tools can enable the automatic discovery of distributed software services and data stores, greatly increasing the range of market options for an organization. The development cycle for these tools is still in its early stage, and much work remains. However, some technologies and standards are already well understood in order to make a significant impact. This paper provides an overview of the eXtensible Markup Language (XML) and related technologies supporting the deployment of web services and service-oriented architectures (SOA). The author summarizes the critical importance of these technologies to the emergence of BI 2.0 tools. This paper also explores the current state of Internet-enabled BI activities and strategic considerations for firms considering BI 2.0 options.

Compilation of References

About the Contributors

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