



BUSINESS INTELLIGENCE
Final Seminar Report

IT730A Business Intelligence A1F
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1 Overview

In the current era of technological development, businesses produce a high accumulation of data through different business transactions and business processes. The huge accumulation of data also known as Big-data exceeds the analytic capabilities of the human mind's perception. In order to be able to handle the huge collection of data in business repositories special software, methods and approaches are developed. Using Business Intelligence technologies companies can scale and handle the historical data, to extract insightful information and make smarter business decisions to stay in the competitive market.

The inclusion of Business Intelligence technologies in modern companies critically matters their success in the world marketplace. Studying and using Business Intelligence (BI) is an exciting approach to finding patterns, measuring business performance towards business objectives, performing quantitative analysis, reporting, and identifying customer behavior. Data-driven organizations use BI technologies to help their decision process to take a lead in the competitive market.

A Data-driven culture embraces data and analytics in decision making. The organizations that adopt the data-driven culture to utilize and use there in the business decision process are getting better business success than their counterparts. The two seminars give me an opportunity to understand in detail Business Intelligence and adopt a data-driven culture in businesses. In this report, the most important concepts and lessons that I have learned from the previous two seminars are described in brief.

2 Business Intelligence / Analytics

2.1 What is BI/Analytics?

Business intelligence and analytics (BI&A) (Chen et al., 2012) have become increasingly important in both the academic and the business communities over the past two decades. Business intelligence (BI) is a broad category of technologies, applications, and processes for gathering, storing, accessing, and analyzing data to help its users make better decisions (Wixom & Watson, 2010). Based on the definition of Watson (2013), Analytics is part of Business Intelligence that deals with the set of algorithms and methods used to find patterns in data and to optimize performance. There are three forms of analytics currently listed by Watson (2013) descriptive analytics to describe what has occurred, predictive analytics to predict what will occur in the future, and prescriptive analytics which is intended to show what should occur. Analytics is a subset of Business Intelligence (Watson, 2013).

According to Chaudhuri et al. (2011), BI Software is a collection of decision support technologies for the enterprise aimed at enabling knowledge workers such as executives, managers, and analysts to make smarter and faster decisions. Business Intelligence and Analytics (Chaudhuri et al., 2011; Watson, 2013; Wixom & Watson, 2010) is a set of techniques, technologies, systems, practices, methodologies, and applications that analyze critical business data to help an enterprise better understand its business and market and make timely business decisions. Business technologies in the past two decades show explosive growth.

2.2 Why is BI/Analytics needed?

The huge data collected in organizations is incomprehensible by experts, which requires the intervention of BI&A tools to extract insightful information to be able to make better and smarter business decisions (Chaudhuri et al., 2011; Chen et al., 2012).

Based on the explanation of Chen et al. (Chen et al., 2012) Business intelligence and analytics are required to enable an enterprise better understand its business data and market and make timely business decisions. Using business intelligence and analytics tools are have many business benefits like cost savings from data mart consolidation, time savings for data suppliers, time savings for users, extracting more and better

insightful information, to make better decisions, to improve the business processes and support for the accomplishment of strategic business objectives (Chen et al., 2012; Davenport, 2010; Wixom & Watson, 2010).

An analytics readiness provides another lens for considering what is required in order to become a successful BI-based organization (Watson, 2013). As explained by Watson (2013), the requirements for BI&A Organization are clear business need, strong and committed sponsorship, alignment between the business and IT strategy, need of fact-based decision making, strong data infrastructure, choosing the right analytical tools, and the strong analytical personnel in an appropriate organizational structure. Transforming the traditional business process of a company to a BI organization is complicated and sometimes hard to implement which demands specialized skills and leaders.

2.3 Application areas for BI/Analytics?

These days, the success of multinational organizations is mostly powered and ignited their business process with Business Intelligence and Analytics technologies (Chaudhuri et al., 2011; Chen et al., 2012). The most popular areas of application of business intelligence technologies as listed by Chen et al. (2012), are briefly described below:

- **E-commerce and market intelligence** -market transformation, customer behavior analysis, etc. BI technologies are widely used in eCommerce sites like Amazon and eBay.
- **E-government and politics 2.0** - Politicians use highly participatory and multimedia web platforms for successful policy discussions, campaign advertising, voter mobilization, event announcements, and online donations (Chen et al., 2012). As government and political processes become more transparent, participatory, online, and multimedia-rich, there is a great opportunity for adopting BI&A research in e-government and politics 2.0 applications(Chen et al., 2012).
- **Science and Technology** - Many areas of science and technology research centers use sensors and instruments in managing, analyzing, visualizing, and extracting useful information from large, diverse, distributed, and heterogeneous data sets to accelerate the progress of scientific discovery and innovation and encourage the development of new data analytic tools and algorithms(Chen et al., 2012).
- **Smart health and well-being** - Genomics-driven big data like genotyping, gene expression, sequencing data, and payer-provider big data like electronic health records, insurance records, pharmacy prescription, patient feedback, and responses accumulated in health centers and research centers adopt BI technologies to process and analyze (Chen et al., 2012).
- **Security and public safety** - BI&A is required to analyze the BIG DATA to prevent Cybercrime and ensure safety.

Additionally, business intelligence and analytics technologies are used in sectors like manufacturing, retail, financial transactions, transportation, telecommunication, utilities, and healthcare (Chaudhuri et al., 2011).

2.4 BI/Analytics evolution?

Chen et al. (2012), listed the three evolutions of BI&A: BI&A 1.0 –DBMS based with structured content, BI&A 2.0 -web-based having unstructured content, and BI&A 3.0 -mobile and sensor-based content.

According to Chen et al. (2012), BI&A 1.0 is the collection of BI&A technologies and applications currently adopted in the industry can be considered as BI&A 1.0, where data are mostly structured, collected by companies through various legacy systems, and often stored in commercial relational database management systems (RDBMS). The main purpose of BI&A 1.0 is the delivery of content to the users only.

BI&A 2.0 added features on BI&A 1.0 to process complex queries along with forward-looking and predictive views leveraging both structured and unstructured data such as social media, mobile data, call center logs (Chen et al., 2012).

Connecting data generated at the edge with data stored in business data centers are the focus of BI&A 3.0 (Chen et al., 2012). Analytics 3.0 is essentially a network-wide distribution of traditional business

intelligence, big data, and the Internet of Things (IoT). The main characteristics of BI&A 3.0 (Chen et al., 2012) are content creation, delivery, and management.

3 Data-Driven Culture

3.1 What is a data-driven culture?

Data-driven culture embraces data and analytics in decision-making. A data-driven culture (Berndtsson et al., 2020) is characterized by a decision process that emphasizes testing and experimentation, where data outweighs opinions, and where failure is accepted –as long as something is learned from it. Data-driven organizations can be best characterized by their desire to turn data into action and their organizational approach (Berndtsson et al., 2020).

The following four definitions of the data-driven culture in an organization has been reported by (Berndtsson et al., 2020) as follows:

- “A true data-driven organization is *data democracy and has a large number of stakeholders who are vested in data, data quality, and the best use of data to make fact-based decisions and to leverage data for competitive advantage.*”
- “A *data-driven culture is characterized by a decision process that emphasizes testing and experimentation, where data outweighs opinions, and where failure is accepted –as long as something is learned from it.*”
- “*Data-driven organizations can be best characterized by their desire to turn data into action and their organizational approach.*”
- “*An organization is data-driven when it uses data and analysis to help drive action—even if that action is a deliberate inaction.*”

Data-driven decisions are better decisions (Mcafee & Brynjolfsson, 2012), and using big data enables managers to decide on the basis of evidence rather than intuition. Business Intelligence/Analytics will integrate into worker and business processes to achieve a fact-based decision-making culture (Watson, 2016). The data-driven culture can be considered as a transformation tool that shifts from the intuition decision-making culture to fact-based decision-making culture using data and Business Intelligence and Analytics tools (Watson, 2016; Kaushik, 2007).

3.2 Problems and opportunities with a data-driven culture?

The problems associated to become a data-driven culture for a company are enlisted by Berndtsson et al. (2020) are: due to the complexity of new technologies the employees may have a lack of understanding and personnel's resistance, lack of new technical skills, insufficient organizational alignment, lack of senior management support, lack of corporate strategy, lack of middle management adoption and understanding, and difficulty accessing relevant data.

The opportunities in the data-driven culture empower operational decision making, positive financial returns, continuous improvement, and competitive advantage, leads to greater transparency and accountability, it ties business decisions to analytics insights and improved productivity and efficiency (Barton & Court, 2012; Berndtsson et al., 2020; Mcafee & Brynjolfsson, 2012; Watson, 2016).

4 Conclusion

BI&A technologies are transforming the way business processes execute and analyzing, and manage historical data to extract insightful knowledge to help managers and decision-makers to choose smarter decisions. Nowadays, organizations are moving towards a data-driven culture. New skills, technologies are updating every day.

References

- Barton, D., & Court, D. (2012). *Making Advanced Analytics Work For You A practical guide to capitalizing on big data*.
- Berndtsson, M., Lennerholt, C., Svahn, T., & Larsson, P. (2020). 13 organizations' attempts to become data-driven. *International Journal of Business Intelligence Research*, 11(1), 1–21. <https://doi.org/10.4018/IJBIR.2020010101>
- Chaudhuri, S., Dayal, U., & Narasayya, V. (2011). An overview of business intelligence technology. In *Communications of the ACM* (Vol. 54, Issue 8, pp. 88–98). <https://doi.org/10.1145/1978542.1978562>
- Chen, H., Chiang, R. H. L., Storey, V. C., & Robinson, J. M. (2012). *BUSINESS INTELLIGENCE AND ANALYTICS: FROM BIG DATA TO BIG IMPACT*.
- Davenport, T. H. (2010). Business Intelligence and Organizational Decisions. *International Journal of Business Intelligence Research*, 1(1), 1–12. <https://doi.org/10.4018/jbir.2010071701>
- Mcafee, A., & Brynjolfsson, E. (2012). *Big Data: The Management Revolution*.
- Watson, H. J. (2013). All About Analytics. *International Journal of Business Intelligence Research*, 4(1), 13–28. <https://doi.org/10.4018/jbir.2013010102>
- Watson, H. J. (2016). Creating a Fact-Based Decision-Making Culture. In *BUSINESS INTELLIGENCE JOURNAL* • (Vol. 21, Issue 2).
- Wixom, B., & Watson, H. (2010). The BI-Based Organization. *International Journal of Business Intelligence Research*, 1(1), 13–28. <https://doi.org/10.4018/jbir.2010071702>