**Data Functional Areas - Data Warehousing & Business Intelligence Management**

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Throughout the history of data management, organizations have commonly employed data analysts to collect, store, and provide insight into any data that can be used to report back to management. A data analyst's current job duties are very similar to this today. However, with the development of technology, many organizations began to wonder if these data analysts have fully utilized the data collected; are there more ways to use this data to advance the organization? Since the 1980s, technology in data analytics has helped develop a standard data model, assisting with the collection and storage of data that can provide more insight into new possibilities to make company decisions and increase their value. (Henderson et. al., 2017). As defined by Herzing University, data warehousing "stores data from a company's operational databases as well as external sources" (Herzing Staff, 2023), and business intelligence refers to "Computer-based techniques used in spotting, digging-out, and analyzing 'hard' business data, such as sales revenue by products or departments or associated costs and incomes." (*Research Guides: Data Warehousing for Business Intelligence: Business Intelligence*, n.d.). Those organizations implementing data warehousing utilize this technology to support business intelligence, promote practical business analysis, and increase innovation using insights discovered from a dataset. An organization can take many steps and requirements to develop data warehousing.

Implementing DW/BI can be challenging, taking multiple steps to complete. The ideal goal is to document the needs of each sector of the organization, asking what they want to accomplish with their data.

Begin with business goals and strategy. Identify and scope the business areas, then identify and interview the appropriate people. Ask what they do and why. Capture specific questions they are asking now and those they want to ask of the data. Document how they distinguish between and categorize important aspects of the information. When possible, define and capture key performance metrics and calculations. (Henderson et. al., 2017).

As you can see, this process must be completed with the help of others. This will eventually help data analysts discover the data necessary for the organization, discover the best data sources, and implement rules for how the data is transformed, stored, and available. Finally, with data storage technology and business intelligence tools, data warehousing and business intelligence can be conducted, transforming raw data into high-quality insights. Nevertheless, what type of tools and technology are needed during implementation?

Depending on what strategy has been implemented for data warehousing, three types of tools will most commonly be used. Tools that support operational reporting analyze business trends over a determined period to discover trends and patterns. Business performance management (BPM) tools provide a formal assessment of metrics that supports the strategy and goals determined. Lastly, descriptive tools provide business intelligence to make real-time decisions (Henderson et al., 2017). When using these, it is recommended that to achieve success with data warehousing and business intelligence; organizations should use professional tools, such as those built by Tableau Software, Oracle BI, or IBM Congos and Watson (Beek, n.d.). Although some tools can be used for free, such as Excel, to conduct business intelligence, you would want to ensure that the tool is, as shown above, descriptive and can provide real-time analysis. According to the Passionned Group, "Excel is free, but we do not recommend using it for Business Intelligence. It is too error-prone, poorly secured, and runs far too slowly." (Beek, n.d.). Microsoft sells a professional business intelligence tool called Microsoft Power BI that works with Excel and other third-party plug-ins. It enables data cleansing before the information is fed to BI analytics tools and delivers geolocation data for enhanced insights and compliance. (Team P. B. I., n.d.). Although organizations are not mandated to implement these technologies, depending on the industry, these tools would help tremendously follow any regulations or standards issued by the governments in their clients are located.

Data warehousing and business intelligence governance are crucial to the success of any organization that relies on data to make strategic decisions. Although it may be expensive to implement, there is an excellent return on their investment in DW/BI tools, "A comprehensive data warehouse governance program ensures that business intelligence assets are expended for business benefit—both directly and indirectly—and that optimal value is achieved from the data warehousing environment." (Williams, 2005). In order to effectively implement DW/BI governance, the data being used for decision-making must be accurate and timely, reducing the risk of making incorrect decisions that could have negative consequences for the organization. This also increases customer satisfaction, "the quality of data will drive customer satisfaction, but satisfaction is dependent on other factors as well, such as data consumer's understanding of the data and the operations team's responsiveness to identified issues." (Henderson et. al., 2017). Also, as stated above, DW/BI governance helps ensure that the organization complies with relevant laws and regulations, which is increasingly important to today’s hackable world, which is another benefit. DW/BI helps to ensure the security of an organization’s data assets, preventing severe data breaches that will damage an organizations reputation and financial losses.

An example of DW/BI being used at an organization is Walmart. With over $500 billion in yearly revenue, Walmart utilizes this technology to generate real-time insight into many aspects of the company. One notable aspect is that they use DW/BI to analyze customer behavior when purchasing their products. This includes determining the most popular products by analyzing purchasing patterns, which helps them optimize their inventory levels and stocking strategies. This can be used to adjust pricing and promotional strategies to improve sales performance. This is also used in every store to stock shelves, display merchandise that is considered popular as well as providing, "insight on new items, discontinued products and which private brands to carry." (Staff, 2017). With real-time insight, Walmart can quickly determine which stores lack the performance and which will eventually have to shutter. According to The Independent, Walmart recently closed the last two stores in Portland, Oregon, due to a lack of sales as well as preparing to close "10 under-performing stores across the country, with other stores set to be shuttered in Arkansas, Florida, Illinois, New Mexico, Wisconsin, and Washington, DC." (Asher, 2023). It is fascinating how Walmart's use of DW/BI can analyze real-time trends at each of their stores and make a justifiable decision to close underperforming stores with evidence, the evidence being data insights over a short or long period.

Data warehousing and business intelligence have helped us utilize newer technology to transform Data analytics for good. However, DW/BI is only effective when there is a shared strategy and analyzing the correct data needed to implement the strategy. That has been determined, one that will change the organization's course. Using professional tools built by Oracle or Microsoft, or tools that either provide business performance management or operational reporting, has helped provide enhanced insights to some of the most influential organizations in the world, including Walmart or even Amazon, ensuring that the data collected generates high data quality and ensuring all regulations are followed. With these professional tools still being developed, who knows ten years down the road what data analytics will look like in the future?

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