

# Transformation of Business Analytics from Business Intelligence

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**Abstract**—With the development of economy, numerous techniques, tools, and concepts have appeared to fit the intensive and competitive market. Especially for some enterprises in retail industry, they face the problem of digital transformation, which requires advanced organizational strategies, business analytics technology, dynamic capabilities, value-creating actions to help solve the problem. This paper analyzes the real cases of digital transformation in some Chinese enterprises to show how business intelligence gradually developed into business analysis and how it creates value to the business. Real experience of the author and the research resources of her internship in a consulting company are also shared. Enterprises often use SAP, ERP, IaaS, SaaS, PaaS to build the cloud services and infrastructure of data ware, which are the products of business analytics. The author analyzes how business analytics help enterprises use effective and intelligent analysis on the data and business to improve the performance of the enterprises, which can make the enterprises become competitive and outstanding. In addition, the difference between business intelligence and business analytics, and how the value business analytics creates to the enterprises in theoretical and practical way are introduced. Finally, the author finds the significant of data and analytical tools to the present and future development in different industries, and predicts the general trend that might happen in the future. People can also realize the impact that data brings to their daily life.

## 1 Introduction

Business analytics can potentially contribute to firm performance and create competitive advantages, while it is a process of the transformation from business intelligence to business analytics. In real enterprises, there are many useful software and tools developing under business analysis technique, which combine business intelligence (BI), customer relationship management (CRM), predictive analysis, and enterprise resource planning together to derive[1]. The software allows businesses and analysts to extract valuable information from the provided data and helps make decisions. In this paper, the author will analyze how business analytics provides competitive edges, how business intelligence changes to business analytics, why business analytics is so important and how business analytics plays its role in the real business. Then the author will conclude the value that business analytics creates to the business and markets. There are two main reasons for the analysis, one is that business analytics is becoming a more and more considerable investment strategy for some enterprises, and organizations are investing huge amounts of money in business analytics tools and software; while business intelligence is the most important technical priority and increases the use of information and analytics to figure out how they interact with each other. Another reason is that, although information on how enterprise-wide information systems can benefit organizations is widely known[2], this is not generalized to business analytics systems. The

advantages of enterprise-wide information systems are keeping standardizing and optimizing only enterprise-wide. By contrast, the advantages of business analytics systems are distributed throughout whole organizations, relying on entrepreneurial activities under local contexts, and progressive strategies[3]. The author would like to research on how business analytics will impact enterprises in the future practically.

## 2 Analysis

### 2.1 From business intelligence to business analytics

With the increasingly indispensable role of data, both business intelligence and business analytics interpret business information and create data-based action plans. In a more accurate way to describe them as two arms of successful business planning: BI shows us the current status of operations, but BA focuses more on predicting future trends[4]. Business intelligence supervises the past and present patterns and trends, taking advantages of the information to make better decision for day-to-day business operations. It gathers problems from organizations or businesses, then answers and tracks, and determines which actions to take to reach their goals[5]. People can create performance benchmarks, spot market trends, increase compliance, and improve business. However, traditional business intelligence, first appeared in the 1960s as a system for sharing information across

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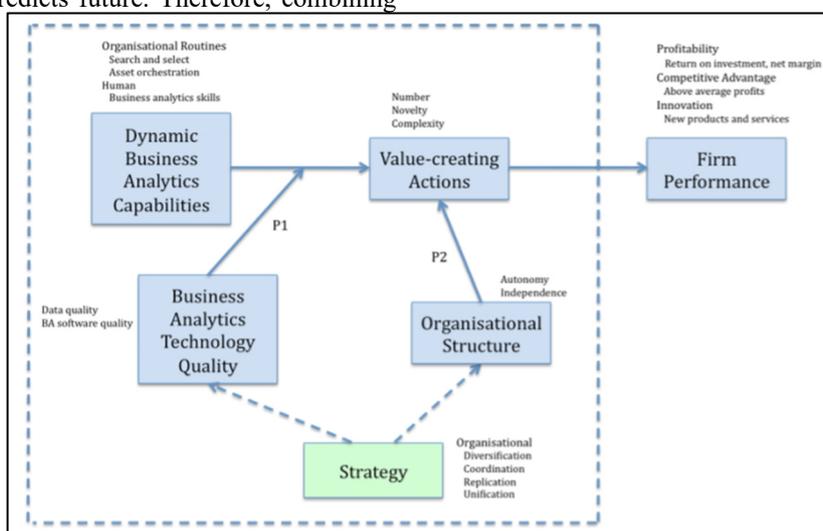
organizations. It was further developed in the 1980s with computer models for decision-making and converting data into insights, and then become a specific product for BI teams with IT-reliant service solutions[5]. Nowadays, BI can be used to prioritize flexible self-service analysis, governed data on trusted platforms, empowered business users, and speed to insight. Business analytics has a lot of methods and tools that are faster and more technical than BI, such as data mining, regression analysis, correlational analysis, customer segmentation, text mining, which help train the data and find the trends and patterns for future prediction. It is the practice of methodical exploration and use of an organization's data with the goal of understanding and improving business processes. It uses both statistical analysis and predictive modeling to improve customer relationships, better control potential risks, and decrease threats based on the analysis of why things happened in the past and if risks will occur again. 'BI+BA=Business Success'[6], although business intelligence pays more attention on current operations and business analytics predicts future. Therefore, combining

the two is a way to achieve agreement on solving business problems both at present and in future.

## 2.2 Value of business analytics

'Big data' tries to discover methods to process the massive amounts of information that are constantly being produced, using computers to process this information to gain insight or competitive advantages. The analysis is required for several fields including product development, marketing, customer segmentation, or some other parts related to business, but is fit in a wide variety of fields such as geology, history and psychology. Business analytics has dynamic capabilities which are the most fundamental effects that enable managers and decision-makers to create value for improve business performance.

The theoretical framework of how business analytics makes value-creating actions is shown below, which is based on the resource-based view.



**Fig 1.** Theoretical framework [7]

In the frame, dynamic business analytics capabilities can trigger value creation actions. Value-creating actions then impact firm performance. Thus, value-creating actions adjust the relationship between business analytics resources and firm performance. Then the Organizational Structure, Business Analytics Technology Quality, and the Strategy may have a significant effective on the extent to which business analysis functions result in value-creating actions and finally to perfect the business performance. However, it is not enough to only have dynamic business analysis capabilities and business analytics tools. It is of great importance to realize the essential role that decision-makers should take actions after opportunities are identified. Take an example, using the insight obtained from the data, enterprises may develop new products based on customers' needs, create new channels, find new ways to promote and attract potential customers, which can improve their performance.

## 2.3 Practical use in enterprises

Business analytics tools and software for enterprises are

essential for their development, suggestion on approaches and market expansion. The appearance of SaaS, IaaS, PaaS, ERP, SAS are the main factors of driving the growth of business analytics market. In addition, these softwares have great impact on reducing risks and errors that are involved in decision-making, and lowering the operational costs, which would result in bigger profit share by accurate analysis and prediction. For example, the author uses different tools to complete an analysis about customer segmentation of an E-commerce database, in order to classify consumers into the different client categories, and Confusion Matrix is used to increase accuracy and quality. Besides, Principal Component Analysis (PCA) is a common technique for reducing the dimensionality of datasets and increasing interpretability, but minimizing information loss, so the author used PCA to ensure the patterns of product clusters keeping truly distinct. The availability of high-quality business analytics technology such as data, software and hardware, is tending to have a more positive and effective effect on the value-creating actions of enterprises. After analysis, the business can have a deeper understanding about customers' needs, and then offer them personalized service and increase the

efficiency of promotion in a larger scale.

## 2.4 Digital transformation in Chinese enterprises-take Alibaba's middle end strategy as an example

There is a wholly new way of thinking about technology that is rapidly taking root in the global fastest growing economy—China, and it is the exemplar of doing business in the digital world. The digital transformation model is shown below.

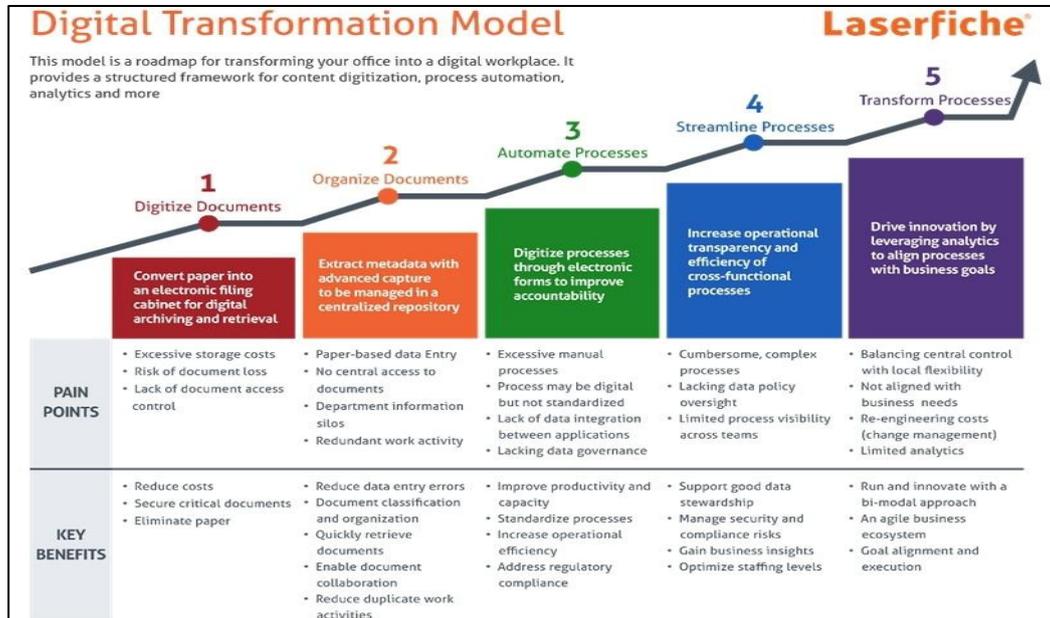


Fig 2. Digital transformation model

Normally, the transformation takes five steps, including digital documents, organize documents, automate processes, streamline processes and transform processes. The purpose is to drive innovation by leveraging analytics to align process with goals, which is close to the job of business analytics. The strategy of digital transformation has risen popularity among enterprises. Alibaba is one of the most successful enterprises in China especially in e-commerce platform. In 2015, Alibaba came up a brand-new middle end strategy called ‘Zhong Tai’, which is the best use of business analytics. It is not an internal system, but a digital channel that can be used to improve performance, share resources, connect customers, manage customer relationships, and fulfill orders after data analysis. In the perspective of business, Zhong Tai seems like something between SaaS solutions and white label solutions[8]. In recent digital transformation cases, many enterprises cooperate with Alibaba to better build a whole Zhong Tai channel. An essential problem needs to be solved is that the front-end development changes so fast that the back-end cannot keep pace. The idea is similar to the neural network model in business analytics, and a middle layer (or end) that depends on the platform (or back end) can be created. The middle layer can be updated very quickly to catch up with the changes in the front end, if teams in a company rely on machine learning (ML), the company could create a platform for the purpose of training, maintaining, and accessing ML models. A middle end would be built on that platform, and would house business logic and expose data to a front end. From the perspective of technology, in the process of data development, the change of the core data model is relatively slow and the workload of maintaining the data is also very large. However, the speed of business

innovation and the changes in the requirement for data are very fast. Nevertheless, the emergence of the data center is to make up for the problem of responsiveness that cannot be kept up due to the mismatch in the speed between data development and application development. The concept of Zhong Tai is the application of combining data science and business analytics.

## 3 Discussion

Data is the heart of business analytics. Numbers are oil in the economic age, while data is the biggest asset and the most powerful energy which can be converted into huge potential energy in minutes. Data is the main basis for enterprises to understand what products to customers, as the more detailed the data, the more accurate the final results obtained through analysis. The website or apps can capture the visiting data browsed by users, and analyze it to find potential user groups based on the data. Digital trends triggered by social media, mobile devices, the Internet of things, and big data not only change people’s lifestyles, but also require companies to rethink and design the original operating mode. The evolution of the digitization process has made “digitalization” out of the concept of binary, becoming a new way for humans to interact with the world. There are five main trends that lead and influence enterprise at present, which are Artificial Intelligence, Blockchain, Cloud service, Big data and 5G. Therefore, management mode of enterprises is gradually improving with the development of network technology, and the demand of digital transformation is growing rapidly. Through data analysis, enterprises can accurately judge the trend and direction of industry development in the future, so as to formulate the

development route more precisely. Meanwhile, digital transformation has also greatly increased the channels for companies to receive information, especially the application of network technology, which allows enterprises to obtain the latest industry information and technological progress in a timely manner, then effectively adjusts its own development path to achieve benefits and avoid harm. Under such background, business analytics plays an indispensable role to help enterprises improve performance and develop better.

## 4 Conclusion

Business analytics drives the process of digital transformation of enterprises and is the fundamental part that companies rely upon for their competitive advantages. It is becoming more crucial as technical and analytical tools are now accessible, from hardware to software, data collection and collective intelligence. As business intelligence is gradually evolving into business analytics, there are still some differences between the two. BI integrated knowledge and insight from past and present patterns of day-to-day business performance, and the information are important to help make decision for operations. Nevertheless, business analytics uses its advanced tools and software to make future predictions based on the existing data, helping attract more potential customers, add personality on target customers and improve the business performance. These changes have increased more efficient, accurate and objective decision-making than before by combining data, statistical analysis and predicting modeling. Information from devices, machines and social media creates new challenges and reinforces the truth that data will keep growing exponentially for the foreseeable future.

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