Summary of the Plenary Speech

Data-Driven Decision-Making for Business Development

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Introduction

Today we are living in a world where we are inundated with data. With the improvement of computer processing power while the unit cost of data storage decreased and data transfer speed the volume of data in the world continued to grow exponentially during the past three decades. A report published by Cisco Systems indicated that the world reached the "Zettabyte Era" or "Zettabyte Zone" in 2016, as the global IP traffic (amount of global data travel through public networks such as the internet) was estimated to have reached 1.2 zettabytes (2017). Also, **all forms of digital data** in the world have exceed one zettabyte in 2012 (2014). One zettabyte (ZB) is equivalent to 10^{21} (1,000,000,000,000,000,000,000) bytes. As of the report published by IDC overall global datasphere reached 64 ZB in 2020. Cloud-based data storage methods, IoT technologies, and sensor networks are the major contributors to the exponential growth in data.

With the wealth of digital data, business organizations have started a culture of Data-Driven Decision Making (DDDM). The data Data-Driven Decision Making is an approach to making decisions based on the insights gained from available data and carefully identified alternative actions to achieve the desired objectives. The data used are from internal as well as external sources, and external data will minimize biases in the decisions made. The advantage of DDDM is, it uses the power of verified data and analyzed information to improve the trust and transparency among the stakeholders regarding the decisions made.

In general business, decisions are made to achieve pre-identified objectives and it will be a selection of the most suitable actions among competing sets of alternative actions. Each of the competing actions may anticipate many consequences related to business outcomes. The challenge is to make the optimum decisions that maximize positive consequences while minimizing negative consequences. But theoretically, it is not possible to recognize all possible alternative actions and their consequences in advance. Further, all these actions and their consequences are associated with uncertainty. Here,

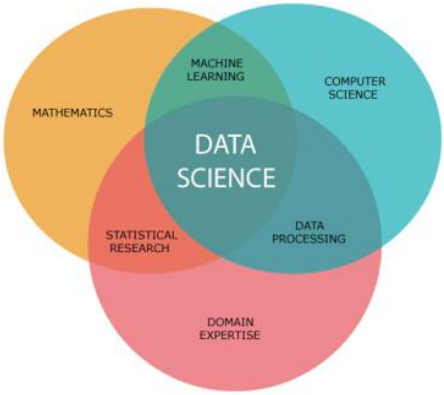
Artificial Intelligence / Machine Learning are important tools commonly used with extremely large data sources to identify alternative actions and quantify the associated uncertainty based on historical information.

But the development of "Business Intelligence" tools was able to minimize the requirement for expert technical knowledge to analyze, visualize and produce reports, and identify trends that facilitate drawing conclusions. Business Intelligence or BI tools are a type of software tools that gather, process, analyze and visualize large volumes of past, current, and future data in order to generate actionable insights, create interactive reports, create dashboards, and simplify the decision-making process (2023).

With the wide development of these software tools and techniques in support of data gathering, preprocessing, analysis, and visualization of "Big Data" a new field of research "Data Science" was born. Data Science is a highly active research area and becoming a unique field of study with the contribution of multiple fields such as Statistics, Mathematics, Computer Science, Machine Learning, Data Processing, and Data Management along with domain knowledge in the specific field of application (Figure 1).

Figure 1:

Multiple fields of studies contributing to data science



1. Why Data-Driven Decision Making Is Important?

The use of proper software tools and especially dashboard visualization will support businesses in making real-time predictions and process improvements for the optimization of performances. These tools will provide capabilities to managers and employees to test the success of different strategies and make informed decisions for the sustainable development of the business. A study conducted by Andrew McAfee and Erik Brynjolfsson has identified that the companies that are practicing DDDM have shown a 4% improvement in productivity and a 6% increment in profits (2011).

It has identified there are many advantages over DDDM and it has been recommended that every growing company should place the DDDM at the heart of their decision-making culture. Following is some of the advantages of using DDDM.

i) Continual organizational growth
ii) Knowledge and Innovation
iii) New business opportunities
iv) Better communication
v) Unparallel adaptability

2. Examples of Data-Driven Decision Making

The leading and largest business organizations around the globe are being used DDDM in all their high-impact business decisions for their success. Exploring the following success stories of the world's most leading organizations will provide examples of how to incorporate data analytics in any organization's decision-making process (2023).

i) Leadership Development at Google

Google maintains a heavy focus on what it refers to as "people analytics." As part of one of its well-known people analytics initiatives, Project Oxygen, Google mined data from more than 10,000 performance reviews and compared the data with employee retention rates. Google used the information to identify common behaviors of high-performing managers and created training programs to develop these competencies. These efforts boosted median favorability scores for managers from 83 percent to 88 percent.

ii) Real Estate Decisions at Starbucks

After hundreds of Starbucks locations were closed in 2008, then-CEO Howard Schultz promised that the company would take a more analytical approach to identify future store locations.

Starbucks now partners with a location-analytics company to pinpoint ideal store locations using data like demographics and traffic patterns. The organization also considers input from its regional teams before making decisions. Starbucks uses this data to determine the likelihood of success for a particular location before taking on a new investment.

iii) Driving Sales at Amazon

Amazon uses data to decide which products they should recommend to customers based on their prior purchases and patterns in search behavior. Rather than blindly suggesting a product, Amazon uses data analytics and

machine learning to drive its recommendation engine. McKinsey estimated that, in 2017, 35 percent of Amazon's consumer purchases could be tied back to the company's recommendation system.

3. How to Enhance Data-Driven Strategy?

If you have decided to become more data-driven in your decision-making process there are many steps to be taken to reach your goal with an analytical mindset (2023).

i) Look for patterns everywhere
ii) Tie every decision back to the data
iii) Visualize the meaning behind the data
iv) Consider continuous professional development

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