Data Analytics Helps Business Decision Making

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Data Analytics Helps Business Decision Making

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March 19, 2017
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Abstract

While business analytics increases its use in gaining data driven insights in supporting business decision making, there has been little research done concerning some of the mechanisms that business analytics uses in improving decision making. Drawing on contingency theory and information processing views, this paper analyzes data analytics, linking IBM Watson Analytics to organizations such as an analytics analyzing airline survey, as well as how data analytics helps in decision making. The purpose of this study is, therefore, to examine the data analytics in decision making. This study examines the history of data analytics and the significance of data analytics while reviewing the traditional business intelligence solutions. Additionally, this study provides a statement of problems demonstrating the features and capabilities of IBM Watson analytics; business components, including the benefits offered by business analytics and cost involved; technology components and IBM Watson Analytics demonstration; and results. IBM Watson results show that it intelligently connects, analyzes, and secures data, hence, improving decision making, as well as customer service. Therefore, the key results and findings show that business analytics positively impact the capability of information processing, which in turn, positively influences decision making. This study’s results supports literature from business analytics through inclusion of useful insights into applications, features, and capabilities of IBM Watson Analytics and assistance of data driven decision-making while comparing IBM Watson Analytics with other tools in decision-making.

1.0 Introduction

Data analytics refers to a program used to organize vast amounts of information and change it into practical understanding [1]. The program educates a user on the main skills necessary for conducting a rational analysis of the kinds of data sets which require interpretation in the current world. However, massive data sets exist to organize well, including structured, unstructured and large data sets. The program employs techniques developed within a series of disciplines such as artificial intelligence, statistics, computer science and mathematics. Through the ability of the program to interpret data, most business organizations use the program to
understand their data and transform their data into practical information; hence, this enhances their decision-making process.

Business requires raw data to formulate and analyze before making decisions that have effects on business success. Competitive markets require relevant and adequate decisions. The constant pressure put on businesses to improve their productivity and cut operational cost sends most of them venturing into technology to help save the situation. Data analytics have come to aid in offering the much-needed reprieve to most companies. The technological advancements in analytical tools used by most businesses have been the pertinent determiners of the successes attained by these organizations over their rivals. A data analytic tool transforms raw data into significant information such as the target of customers, the performance of activities and competitive advantages. Effective decisions can enhance the operations of business. Studies show that business analytic tools have enabled companies to improve marketing effectiveness. Data analytics helps marketers to improve their decision-making programs and help business to reduce cost. Moreover, it also ensures appropriate utilization of new products and services. The traditional business solution lacks speed and efficiency. IBM Watson Analytics provides a useful example of a modern decision-making system.

In the following, it presents background including the history of data analytics and review of traditional business intelligence solutions, a statement of the problem including three problems, the business component including benefits and cost, technology component including IBM Watson Analytics demonstration, and results.
2.0 Background

2.1 History of data analytics

Data analytics in business emerged as a separate discipline in the 1950s. The period saw the development of analytic 1.0. During this time came development of tools capable of capturing information, and identifying patterns and trends more quickly than the human mind [2]. In this era, there existed small and structured internal data sources, batch-processing operations taking months and few detailed reports. Most analysts in the 1950s focused on data collection and preparation without paying more attention to data analysis since the level of software had not advanced yet. During this period, most organizations started experiencing a progressive increase in their data volumes [1]. Consequently, the need to examine this data grew over time and this made the organizations search for better software that could help in analyzing these large volumes of evidence.

In the mid-2000s, the analytic 2.0 appeared. The establishment of analytic 2.0, created a difference in both quality and quantity of data. Social networking sites such as Facebook and Google were used to initiate the process of discovering, collecting, and analyzing new information [2]. Companies obtained internal operations generated small data from various sources [2]. The sources included the internet, projects, and public data. The advancement in data quality led to the switch from analytic 1.0 to analytics 2.0. The onset of big data culminated in the fast development of novel processes as well as new technologies. Companies increased ability to analyze their significant amount of data to enhance their insight and profit. In this era, there was the establishment of novel structures of processing, for instance, the software for productivity trackings like NoSQL and Hadoop.
The third period of data analytics occurred from 2010 onward. This era led to the creation of analytic 3.0. The customers in the period face a personalized user experience due to use of analytics. Today there exists a revolution in database and memory connect with responsive methods, and also, a linkage between data and the ability of computers to offer required outcomes on time. Furthermore, the emergence of new disciplines such as prescriptive and predictive analytics complement the previous descriptive analytic in analytics 2.0 [2]. Prescriptive and predictive analytics provide insight on the likelihood of occurrence of an event in the future. They also offer a possible course of action to remedy such situations. However, the evolution of business analytics continued as the business world continued to grow and became more creative with how they used information to make competitive decisions.

2.2 Significance of data analytics

The application of an analytical tool works towards enhancing the operations of business. Attaining the largest market share requires the application of tools that work towards embracing the current events and technologies used by the competitors. Business that embraces data analytics reports to be ahead of their rivals in all aspects as they accurately identify the needed changes backed with relevant and authentic data.

One of the benefits of using data analytics is that it helps a business to reduce cost. The tool guides a business to employ resources in areas that need them the most. This eliminates the waste of resources, which typically drain the profits acquired [3]. Hence, a business is capable of reducing the labor costs and the operation cost by applying data analytics appropriately.

The analytics tool ensures faster and better decision making. A business remains relevant based on decisions. Effective decisions aid in propelling a business forward as opposed to
ineffective decisions. Therefore, analytics tools provide data that is properly analyzed and conclusions deduced from it. Such use eliminates errors made with decisions that have no support.

The analytics tool ensures appropriate utilization of new products and services. The products and services used by the clients need to be ones that satisfy their needs. Additionally, products employed by a business should be ones that targets to solve a particular problem identified within a business [4]. An analytics tool thus aids the business management in the identification of the correct products and services that have received high demands both by the client and the business. For instance, the use of IBM Watson Analytics allows a new partnership between people and the computers.

2.3 Review of traditional business intelligence solution

Business Intelligence (BI) systems assist business institutions by improving the effectiveness of decision-making process by business managers. BI can serve an environment of any size. It is possible to scale to deal with a massive amount of data and serve a very high number of users [11]. Another important aspect is that BI offers many different features that make it possible for companies to handle various reporting types. BI requires a high level of technical expertise. Users need Information Technology (IT) in performing even the most fundamental functions, for example, building a report. IT experts are required to have SQL query skills, or they can learn a proprietary query language for implementation. Data mining is a very important process in BI solutions. This process involves bringing together different data. Statistical based algorithms are used to process data to retrieve useful information from it. People prefer dealing with large data amounts as opposed to single information. Therefore, the use of
statics in data analysis is quite relevant in the generation of profitable knowledge in any business. Scholars classify algorithms used in data mining into three levels. The first one is simple algorithms. Under this category, users perform SQL queries. The second level deals with intermediate algorithms. These algorithms involve computation such as regression analysis and decision trees. The last level is for complex algorithms that involve neural networks. The users need to spend a lot of time to learn how to use BI systems.

BI has become even more important in a highly competitive business environment [5]. In today’s competitive business world, the organization has invested heavily on BI to help in improving their decision-making process. The systems provide many benefits to business organizations [6]. Through it, business institutions managed to make fact-based decisions, personalize sales, reduce waste and identify various opportunities. However, despite these benefits business intelligence has posed many challenges to business organizations. Some of the challenges include the following:

Building BI involves costs including human resource and financial expenses. The problem appears even bigger for small businesses. It may prove costly for such businesses to buy or develop relevant BI tools. They may also face hardship in obtaining professionals for maintaining and training the business intelligence [7]. Besides, if built incorrectly, it can lead to a waste of time and an enormous amount of money. The cost required to develop BI includes software, maintenance, implementation and hardware costs [5]. For example, the estimated maintenance costs for BI software are approximately 15 percent of the purchase cost. In a big firm, implementation cost ranges from $6 million to $3 billion [6].

The complexity of a company’s data has risen significantly. The organization today faces
complex decisions that require advanced analysis. The decision regarding production, expansion, competition and investment have become complex and critical in the recent [6]. The business organization thus require a complex system to help them in decision making. Therefore, the business institution needs advanced business intelligence to analyze this data. Unfortunately, most business intelligence fails to keep the pace with the needed adjustment. Consequently, decision-making in most companies today lags behind.

Business intelligence is of critical value to companies today. However, the time required to build this system remains considerably long. In most cases, it takes up to 18 months for complete implementation of the system by data warehousing [7]. The longer duration leads to decision gaps that may be detrimental to organizational performance. It may result in loss of viable opportunity, loss of revenue and poor decisions [5].

3.0 Statement of the Problem

3.1 Demonstrating the features and capabilities of IBM Watson Analytics.

IBM Watson Analytics site promises:” A smart data discovery service available on the cloud; it guides data exploration, automates predictive analytics and enables effortless dashboard and infographic creation” [8]. Many businesses lack an understanding of the claims made by IBM and are unable to evaluate them. Understanding the features and capabilities of IBM Watson Analytics is the first step in deciding if they are appropriate for business.

3.2 What kind of questions can IBM Watson Analytics answer?

IBM Watson Analytics uses the language and keywords of your business to build questions that explore and visualize your data [9]. Although the questions appear free from, they
must contain column titles, and data sets with additional keywords to be understood. Examining
the process of building questions, provides a clearer picture of Watson’s capabilities.

3.3 Compare IBM Watson Analytics with other tools in decision making.

IBM Watson Analytics site promises:” IBM Watson Analytics is a smart data analysis and
visualization service you can use to quickly discover patterns and meaning in your data – all on
your own. With guided data discovery, automated predictive analytics and cognitive capabilities
such as natural language dialogue, you can interact with data conversationally to get answers you
understand. Whether you need to quickly spot a trend or you have a team that needs to visualize
report data in a dashboard, IBM Watson Analytics has you covered” [10]. Other companies, SAS
and Salesforce, offer products that compete with IBM’s. A comparison of SAS Visual Analytics
and Salesforce Analytics allows consideration for the choice that will best suit a particular
company.

4.0 Business Component

4.1 Decision making in business

Decision making serves as a crucial component of corporations in the modern community.
In essence, business decisions determine the success or failure of business in any given
environment. The process of making decisions remains a complex one due to the various forces
involved. Different parameters affect the business decision-making process. Moreover, human
beings serve as intelligent individuals [11]. As a result, the managers become indecisive when
faced with multiple choices within the business environment. Laxity in making proper decisions
increases the probability of failure within the corporations. Decisions must be accurate and fast
to ascertain that the firms benefit from all situations within the business world. In such a way, it
remains evident that human beings fail to achieve the required rate of accuracy and timeliness. As a result, the use of computer systems to make such decisions increased in recent times [12]. Subsequently, various benefits remain apparently due to the use of such a computer system to help in decision-making procedures.

4.2 Benefits of IBM Watson Analytics

IBM Watson Analytics converts data to information quickly and easily, enabling users to get insights, and in turn, make business decisions. It can help the business to save time and money, and make better decisions.

4.2.1 The case of PensionBee

At the core of the world economy is the tenet of demand and supply, which is governed by the flow and proper analysis of data. Herein, IBM Watson Analytics is a key master tool used to draw patterns and give insights to avoid market losses [13]. IBM Watson analyzes past buying and selling patterns and uses this information to give acumens. Also, the application uses artificial intelligence to generate successful leads.

As evidenced in the case of PensionBee and FinTech startup, IBM Watson Analytics insights drove up to a 50 percent increase in successful leads. During its startup phase, PensionBee lacked internal systems to run an automated yet effective lead generation process. The PensionBee had a cutting edge service which enabled individuals to check their existing pension in real time and consolidate this information into a single retirement plan. However, the main challenge was to converge data from respective pension agents, analyze sign ups, and lastly generate leads through data received from the two parties. Moreover, as previously mentioned, the firm lacked computing resources to store and process all this data. The IBM Watson
Analytics platform solved all these risks faced by PensionBee.

In effect, pension agents easily exported data to IBM Watson Analytics which then linked it to signups made by customers and generated a list of clients and correlated this information with location data to generate better leads. In other words, PensionBee developed five automated applications that automatically generated customer support mails to prospective consumers depending on their location and position in a formulated algorithm. Eventually, Pension Bee managed to save 50 percent of the time projected to build customers’ profiles and effective account management [4]. Customers’ profiles including name, email, gender, date of birth, phone and postcode. Moreover, as a result of better data analysis, PensionBee enjoyed personalized and improved customer service which augmented customer satisfaction.

4.2.2 The case of Mondi

Take the case of Mondi, an international packaging company facing a bottleneck induced by significant growth. In reality, unprecedented growth through acquisition caused data volumes and end users accessing its core SAP system to upsurge. As a result, the company's SAP repository and reporting system were over-utilized, making it slow. In solving this stalemate, Mondi migrated this whole system to be hosted by IBM and analyzed by IBM Watson Analytics. Moreover, this migration was achieved within a weekend with no disruptions to operations. Through implementing the IBM Watson Analytics system, Mondi enjoyed between 300-400 times faster report generation, saving on time. Moreover, more than 200 hours of labor was saved monthly, cutting labor costs by 35 percent. Fast migration reduced downtime and interruptions [13].
The advantage that Mondi Company harnessed from the IBM Watson was the smooth transition from one system to the other. The company previously worked with Watson for over 10 years implementing different projects. That meant they maintained good rapport and hence, for a real-time change, the company needed an expert who would reduce the workload and generate the information from the data they gathered. IBM gave out a team of 12 experts to work on the transition. More experts were engaged later on to optimize on the process of migration, and within no time, Mondi gained a new system that was faster, one able to process large quantities of data and generate meaningful information. In addition, Mondi started receiving positive feedback from the clients rather than the complaints they were accustomed to. A staff member of the company, Rainer Steffi said they had an incredible experience with the IBM team that facilitated the migration [14]. He adds and says that the team showed high levels of professionalism and organization, and focused towards solving the problems the company experienced. Furthermore, IBM worked closely with the SAP team which offered their analytic services earlier on hence, making the whole process quick and convenient for the company.

Mondi Company used the applications management operations from IBM Watson for an incredible experience. The collaboration between the company’s staff and that of IBM is good and is focused towards achieving the goals of the company. Furthermore, IBM provides the best storage services for the company. The information generated can be stored for future reference and can easily be retrieved when the need arises. In addition, the generation of information after analysis is automated, and it becomes easier and faster for the user to get what is needed and make a decision based on reliable information [14].
IBM Watson also improved the reporting system at Mondi. The reporting operations are faster and convenient as compared to the previous business intelligence systems. From the company’s remarks, the reports are completed three times faster than the previous system [15]. One report is completed 400 times faster than before, 20 reports are completed 100 times faster, while over 150 reports are completed between 100 and 10 times faster than before. This is an indicator of faster operations, and hence, the management and clients of the company are happy and satisfied with the services provided by the company. Several of the company’s departments used the Sap system. With the integration of IBM, the reports are generated between 2 to 3 times faster than before. The improvements are incredible because the staff and customers can get quick insight on what is going on in the company. It also helps realize the challenges faced and solutions sought as fast as possible [16].

With the quick reporting system, more hours are also saved. Time that is wasted waiting for a response is being channeled into performing analysis of the company’s figures and lets people give feedback on the information generated. Allowing external parties to give their opinions in the progress of the company can help identify the gaps that needs to be filled, hence, improving on the quality of services provided by the company. A minute or second saved while generating a report gives the management team an opportunity to make critical decisions important to the development of the company [17].

Having a peaceful mindset is another advantage that IBM provides to Mondi. The management team is able to make company decisions within the set time and there are no delays, customers are satisfied with the products and services provided by the company, challenges that might be faced are identified and dealt with early enough, and the company’s team works with a
mindset towards the goals of the company. All these benefits are made possible with the IBM Watson, and hence, provide a peace of mind to the teams involved. All that a company needs to focus on, especially Mondi, is the commitment to the duties and development of the company.
4.3 Cost analysis and implementation time

Implementation of IBM Watson Analytics Professional, costing approximately $47,659.99 a year, gives a return on investment ratio of above 96 percent. Specifically, an investment of $47,659.99 per annum gives cumulative benefits above $93,472.

ROI=(Gain from Investment-Cost of Investment)/Cost of Investment [18].

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cost</strong></td>
<td></td>
</tr>
<tr>
<td>Acquisition</td>
<td>$ 960</td>
</tr>
<tr>
<td>Technology Analyst Salary</td>
<td>$46,655</td>
</tr>
<tr>
<td>Learning IBM Watson Analytics</td>
<td>$44.99</td>
</tr>
<tr>
<td><strong>Total cost</strong></td>
<td>$47,659.99</td>
</tr>
<tr>
<td><strong>Benefit</strong></td>
<td></td>
</tr>
<tr>
<td>Servers - hardware</td>
<td>$ 4,651</td>
</tr>
<tr>
<td>Finance Analyst Salary</td>
<td>$88,821</td>
</tr>
<tr>
<td>Faster decision-making</td>
<td>###</td>
</tr>
<tr>
<td><strong>Total benefit</strong></td>
<td>Above $93,472</td>
</tr>
<tr>
<td><strong>ROI</strong></td>
<td>96%+</td>
</tr>
</tbody>
</table>

Figure 4.1: How to arrive at ROI ratio
Figure 4.1 shows how to arrive at the ROI ratio. Let us assume a business implements IBM Watson Analytics in Portland, Oregon, in 2017. A business will not buy any servers - hardware which costs at least $4651 to run the analytics software [19]. This means one business can save $4651 on the server. Second, a business just needs to employ an information technology analyst rather than a finance analyst. Figure 4.2 shows an information technology analyst salary is $46,655 per one year [20]. Figure 4.3 shows a finance analyst salary is $88,821 per one year [20]. Third, the IBM Watson Analytics professional plan can be accessed by many end users. Figure 4.4 shows the price of IBM Watson Analytics, the professional plan just needs $80 per month, $960 per year [21]. Fourth, Learning IBM Watson Analytics, a book by James D Miller, is an easy-to-follow practical guide, at just $44.99 [22]. Finally, IBM Watson Analytics can be implemented fast, within a day or a minute, without posing downtime threats. This means IBM Watson Analytics can create great benefits. By examining these details, one can see the ROI is at least 96 percent.

![Your Personalized Information Technology Analyst Salary Report](image-url)

**Figure 4.2: Information technology analyst salary**
Your Personalized Finance Analyst Salary Report

Job Profile

Based on the answers you provided, you should average **88,821** in **Portland, Oregon** which is **3% higher** than the national average.

<table>
<thead>
<tr>
<th>Portland, Oregon Average</th>
<th>National Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>88,821</td>
<td>85,907</td>
</tr>
</tbody>
</table>

Figure 4.3: Finance analyst salary

---

<table>
<thead>
<tr>
<th>Free</th>
<th>Plus</th>
<th>Professional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upload spreadsheets, get visualizations, discover insights and build dashboards all on your own.</td>
<td>Get all the features of Free plus more storage and data sources, including databases and Twitter.</td>
<td>Get all the features of Plus plus a multi-user tenant to collaborate, more storage and more data.</td>
</tr>
<tr>
<td>$0.00 USD</td>
<td>Starting at $30.00 USD per user per month</td>
<td>Starting at $80.00 USD per month per authorized user</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1 user</th>
<th>1 user</th>
<th>1 or more users</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 MB of storage included</td>
<td>2 GB of storage included</td>
<td>100 GB of storage included</td>
</tr>
<tr>
<td>Professional single user trial for first 30 days</td>
<td>Add storage in 100 GB increments for a minimal fee</td>
<td>Add storage in 500 GB increments for a minimal fee</td>
</tr>
<tr>
<td>Access relational databases, on prem and on cloud</td>
<td>Access relational databases, on prem and on cloud</td>
<td>Access relational databases, on prem and on cloud</td>
</tr>
<tr>
<td>Access 18 data connectors</td>
<td>Access 18 data connectors including IBM Cognos reports</td>
<td>Access 18 data connectors</td>
</tr>
<tr>
<td>Access Twitter data</td>
<td>Access Twitter data</td>
<td>Access Twitter data</td>
</tr>
<tr>
<td>Limited access to IBM Analytics Exchange offerings</td>
<td>Full access to IBM Analytics Exchange data &amp; offerings</td>
<td>Full access to IBM Analytics Exchange data &amp; offerings</td>
</tr>
</tbody>
</table>

Figure 4.4: Price of IBM Watson Analytics
5.0 Technology Component

5.1 How is IBM Watson Analytics work?

IBM Watson Analytics is a cognitive system which works by analyzing information. It is reliant on natural language and can process information from different sources [23].

IBM Watson Analytics is a system which has learning capabilities. Therefore, it can adapt to the environment. It learns different contexts of the language used, as well as the mode of thought and the jargon, so that it can draw conclusions appropriately. It works like a search engine by sifting through data and the combination of its cognitive capabilities allows for it to translate information into the required context for better decision making [23].

IBM Watson Analytics preprocesses data in a process called ingestion, where building indexes and metadata increase the efficiency of working with the content. The system then creates a knowledge graph which creates more precise answers to questions [24].

IBM Watson Analytics also constantly updates for purposes of constant adaptations to knowledge and linguistic patterns. The system, therefore, gives answers to complex situations and questions, and easily and quickly provides responses and recommendations with evidence to back it up. It also identifies patterns, or new insights and patterns which are locked away in between information. It is used in uncovering new approaches and possibilities within data for better evidence-based decisions-making.

IBM Watson Analytics, due to its capabilities, works in different professions saving time and uncovering previously unidentified data. IBM Watson Analytics learns, adapts and grows smarter with continued exposure. Its value increases as it builds knowledge and learns with the continued interactions of failures and successes of users and how humans function [23].
5.2 Using IBM Watson Analytics analyze airline survey

Given the fact that the tool has some amazing benefits to the business such as improved decision making, efficient management of new products and services, data analyses and other benefits, it’s very clear that the costs of implementing the system are less than the potential returns that the data analytics tool would bring the business. Since the tool runs on the cloud, the business implementing the system doesn’t require complex hardware and software to implement the data analytics tool, but only computers with browsers for internet access.

The IBM Watson Analytics tool is concerned with addressing key tasks which are:

*What’s happening to clients?*

This is a key data analytics task that seeks to discover and explain the environment with which customers interact. For example, an airline company may want to find out what impact flight delays have to their customers and their satisfaction levels.

*Why is it happening?*

This is a task that is automated by the data analytics tool and seeks to explain some of the factors that contribute to the problems that a business' customers face. For example, for an airline industry, customers' satisfaction levels could be affected by flight delays, flight distance offered, ticket prices, quality of customer service, etc. The tool could help a business to pinpoint these factors from their datasets accurately.

*What are the actions that could be taken to improve customer satisfaction levels?*

This task involves making decisions to address the problems customers face or how to improve the company’s products and services. The IBM Watson Analytics tool has predictive features that have solutions to address the problems being faced by the business. This task could
be relatively complex if done manually, but the tool has automated the process by making it easy for businesses to make informed business decisions.

5.3 How to access the system

To access the system, one has to create an IBM account by signing up for a free account on the IBM Watson’s homepage. Figure 5.1 shows the registration page.

![Registration page](image)

Figure 5.1: Registration page

After the registration process is complete, the user could then access the system by signing in using his or her IBM Id and password.

From the airline survey example, one clicks the “New Data” button from the system to add data into the system (Figure 5.2). After uploading the data, the user can discover patterns by typing in a question for analysis or use one of the template questions that best fits the needs of the user (Figure 5.3). The fact that the user can type his or her question means, the system can communicate with the user using natural language. The system then responds with visualized data with patterns derived from the dataset.
Figure 5.2: Add Data

Figure 5.3: Template Questions
If the users don’t know how to ask a question, there is a coach to help the users. Please tap the “How to ask a question.” Figure 5.4 shows the categories of questions. According to the questions in each category, it can help users to ask questions.

![Figure 5.4: Categories of Questions](image)

From the airline dataset, the question typed was “How does satisfaction compare by airline name?” (Figure 5.5). The system then generates graphs based on the question asked and the attributes used in the dataset (Figure 5.6).
Figure 5.5: Type Question “How does satisfaction compare by airline name?”

Figure 5.6: Graphics based on the question
Another example of an issue that was asked was how satisfaction values compare to flight distance. This feature allows data summarization by sum or average or other mechanisms. Figure 5.7 shows the graph generated.

Figure 5.7: How do the values of flight distance compare by airline name?
The question could then be expanded to include other variables such as the type of travel, the system responds by dynamically generating a graph including refined details about satisfaction levels based on the type of travel. Figure 5.8 shows a clear example of how it works.

Figure 5.8: How do the values of satisfaction compare by airline status and type of travel?
IBM Watson Analytics explores the factors that influence behaviors and actions and uses that data to predict future trends and data outcomes. The feature uses the key attributes and analyses them using statistical tools to display visualizations of the changes that would take place on the data with time by using decision trees. The feature also generates actions that could be taken to improve or resolve the problem at hand. For example, the system may recommend the reduction of airline tickets and reduce flight delays as a measure to improve customer satisfaction levels.

From the airline dataset used, one has to create a new workbook for the predictions to take place. The fields used as predictors can either be one field or multiple fields as shown in figure 5.9.

![Decision tree works based on dataset](image)
One feature makes it possible for the user to determine what would be displayed on the dashboard. For example, the user might want to display graphs on the homepage to display visualizations of the current dataset and compare it with the predicted dataset. This feature makes it possible for the user to specify the details that need to be used such as color coding schemes, use of combined or single attributes, types of graphs to be used, etc. Figure 10 shows the dashboard.

Figure 5.10: Dashboard
6.0 Results

6.1 Demonstrating the features and capabilities of IBM Watson Analytics.

IBM Watson Analytics site promises:” A smart data discovery service available on the cloud; it guides data exploration, automates predictive analytics and enables effortless dashboard and infographic creation” [8]. Many businesses lack an understanding of the claims made by IBM and are unable to evaluate them. Understanding the features and capabilities of IBM Watson Analytics is the first step in deciding if they are appropriate for the business.

6.1.1 Features

IBM Watson Analytics offers many features that have made it one of the most useful software programs in the business sector. One of its major features is the self-service option. Based on this feature, IBM Watson’s design makes it easy for the user to obtain data, analyze it and discuss the findings [25]. Additionally, this feature makes it simpler for the user to read the unforeseen trends [26]. Natural language dialogue is another feature, which enhances IBM communication in a business language such that the users can understand it [27]. In essence, the user feeds data that he anticipates seeing. Nevertheless, the results generated by the software often resemble the business terms.

Another major feature of IBM Watson Analytics is stories. This feature enables IBM Watson Analytics to act like a stepping-stone to one's analytics process. Essentially, the user is capable of diagnosing a problem, and if the issue is similar, he can then utilize templates for his analysis. Interestingly, single business analytics experience is another feature of the IBM Watson Analytics. This feature allows business professionals to obtain data, analyze it, and after that, refine it [28]. Besides, it enables the user to know the insights, predict the outcome and see the
IBM Watson Analytics also offers a one-click analysis feature. This feature allows for making sense of data findings within one click. Using this feature, the delicate work such as arithmetic and coding is handled on behalf of the user, who then accrue all the benefits without much complexity [30].

6.1.2 Capabilities

Apart from the business-enhancing features, IBM Watson Analytics is endorsed with a number of capabilities. One of its major capabilities is automated data recovery. This affirms the capability of IBM Watson Analytics to automatically generate outcomes when the user feeds in the data obtained [12]. The other major capability of this software is exploration. Reports proved that IBM Watson Analytics provides the users with compelling visualizations that help to explore data, and discover the association and trends that affect the business, thereby acting suitably [31].

Next off is that the IBM Watson Analytics also offers a capability in dashboard creation. This capability enables the user to develop spiral graphs and a couple of visualizations that assist in finding the targeted predictors for platforms and others. Impressively, IBM Watson Analytics is also capable of telling stories visually. IBM Watson Analytics help the human to understand the patterns easily. Interestingly, the majority of the visual procedures are enhanced when connecting to visual imagery [32].
6.2 What kind of questions can IBM Watson Analytics answer?

6.2.1 Building questions

IBM Analytics uses a system of language and words to generate questions that help in exploring and visualizing a given data set. The basic element used by IBM Analytics is the data value, which is guided by the column titles based in a specific keyword. Thus, it is possible to generate multiple questions regarding an organization from one keyword and numerous column titles that guide a predefined data value.

The data set shows an airline survey. The keyword in this dataset is *efficiency* while the data value is *flight* and there are numerous data sets that include airline status, age, gender, price sensitivity, year of first flight, number of flights, type of travel, number of loyalty cards, shopping amount at airport, eating and drinking at the airport, class, day of month, flight date, airline code, airline name, origin state, destination city, destination state, scheduled departure hour, departure delay in minutes, arrival delay in minutes, flight cancelled, flight time in minutes, flight distance, and arrival delay greater 5 mins.

The procedure used for developing questions for IBM Watson Analytics involves matching the words in the problem to the column titles of the given data set. The second step is matching the words remaining in the question with real data values in the given data set. Finally, the keywords aid in selecting and formatting the visualization.

For the data set provided, a feasible question would be: What is the degree of efficiency and satisfaction of flights? In the question, the keyword is *degree* while column titles are *efficiency* and *satisfaction* whereas the data value is *flight*. The data sets contain numerous
column titles that support the above titles in developing key questions regarding flight, which help in the analysis of the data set.

<table>
<thead>
<tr>
<th>keyword</th>
<th>column titles</th>
</tr>
</thead>
<tbody>
<tr>
<td>degree</td>
<td>efficiency</td>
</tr>
<tr>
<td>satisfaction</td>
<td>flights</td>
</tr>
</tbody>
</table>

What is the degree of efficiency and satisfaction of flights?

Figure 6.1: Building question

6.2.2 *Add special keywords to build question*

The users add the following special keywords to refine the questions. These special keywords including compare, trend, contribution, relationship, breakdown, and grouping. Each of these keywords makes a different impact on how the data is retrieved and how the resulting visualization is created [33].

**Compare**

How do the values of <Column title> compare by <Column title>?
How does the type of travel compare with the <age> and <gender of passengers>?

**Trend**

What is the trend of <Column title> over <Column title>?

What is the trend of <destination travel> over <departure travel> for a flight?

**Contribution**

What is the contribution of <Column title> and <Column title>?

What contribution does the <type of airline> make to the <flight destination>?

**Relationship**

What is the relationship between <Column title> and <Column title>?

What is the relationship between <origin state> and <destination state>?

**Breakdown**

What is the breakdown of <Column title> by <Column title>?

What is the breakdown of the <departure city> and <city of destination>?

**Grouping**

What is the grouping of <Column title> and <Column title>?

What is the grouping of <number of airlines>?

6.3 Compare IBM Watson Analytics with other tools in decision making.

6.3.1 **SAS Visual Analytics**

SAS Visual Analytics is an alternative data-discovery tool employed in business to assist in the process of making decisions. Just like the IBM Watson Analytic tool, the SAS Visual Analytics tool is available on the cloud [34]. Both the SAS Visual Analytics and the IBM Watson Analytics follow the same reporting standards of the business intelligence [35]. They
both provide comprehensive pixel reports, customized dashboards, and even the templates for the report formatting. They also access control and security, and even offer the same data discovery and visualization. Unlike the IBM Watson Analytics framework, the SAS Visual Analytics tool reinforces the use of visuals such as graphs and charts to aid in the solicitation and interpretation of data.

The SAS Visual Analytics operates in different disciplines. Whereas the IBM Watson Analytics addresses business related data collection initiatives, the SAS visual tool functions in the healthcare industry as well [36].

The speed of functionality of the SAS tool is relatively higher [37]. Furthermore, the database of the SAS Visual Analytics stores information which is more limited than IBM Watson Analytics. The SAS Visual Analytics comprises the challenge in the business framework. The complexity of the SAS Visual Analytics always sets higher rating prices compared to the IBM Watson Analytics.

In that case, the IBM Watson Analytics deals with anything that contains textual data, as its ultimate target is to develop the instance that may enable the processing of the textual information the way human beings may do it [38]. Conversely, SAS Visual Analytics is especially suitable for the collections of big data with good structure. The device is not designed for unstructured data sets or documents. Its key strength is processing speed, especially when it is implemented on the Hadoop.

6.3.2 Salesforce Analytics

Salesforce Analytics comprises another technology in the realm of data collection, analysis, and interpretation. The Salesforce Analytics employ across all industries in different
departments [39]. The product is suited for the person or even the team devoted to the analysis of the data in the business processes [40]. People use the Salesforce Analytics as a primary means of analytic research and even reporting the visualization for the management of the enrollment. It is also a user-friendly product and provides the non-technical staff with instant access to the data and even the actionable insights from the visualization of the data. This product’s advantage is its development on the platform of the Salesforce that allows the integration of the navigation with all the enrolled data.

However, it is more efficient in the business segment given that it requires the inputs of business concepts. Unlike the IBM Watson Analytic tool, the knowledge of the data architecture determines the successful employ of Salesforce Analytics. This is because, unlike the IBM Watson Analytics framework, it does not integrate natural language queries nor offer succinct responses based on the queries. Given its complexity in interpreting data, Salesforce Analytics is priced lower than the IBM Watson Analytics in the market. Furthermore, it has a lower processing speed than the IBM Watson Analytics framework which significantly reduces its value in the market.

The IBM Watson Analytics parses the textual data well. The great features linked to it to analyze the textual information, and one does not have to determine the real coding of the world to apply it.

7.0 Conclusions

Data analytics makes it easier for businesses in analyzing and interpreting data into meaningful information. Data analytics significantly from the 1950s to date; businesses are
experiencing more advanced and faster systems. IBM Watson Analytics is one such system that is helping businesses and business owners in making significant decisions. The decisions are directed towards the product and services being offered and the customer-base reached. The features and capabilities of the system make most businesses grow and increase their customer size.

IBM Watson analytics analyzes complex data into meaningful information. It does these processes a faster way and the feedback generated is understandable to both the technical and non-technical staff. Before a business decides on choosing IBM, they must consider the field of practice, the kind of data to be analyzed and the resources that have been allocated to the department. Considering the professional or business field is important because IBM mainly focuses on business and business related issues.

Features that make IBM stand out from SAS Visual analytics and Salesforce analytics include; self-service whereby an individual easily accesses the data and generate information on his own. The process is easier and non-complex; thus encouraging more people to use it. The ease of use makes a manager or owner of a business easily choose when it comes to making a decision. He can do it because there is ready feedback. Automation of analytics processing by this service justifies its description as a self-service tool. For example, one can find relevant data. Diverse sources and data types get to be the technology can work with any form of data. Several aspects of data quality and cleansing are also automated, and this ensures trustworthiness of the data. Analysts can have more time to analyze data than locating and preparing it for analysis. Lastly, Watson’s Cloud deployment enables large amounts of data to be incorporated, and end users can obtain fast analytics results. The language used by the system is another feature that
makes the system stand out. Use of natural language is an advantage to many users as they have
the opportunity of getting needed feedback easily. I believe a person will have an easy time and
be interested in something if they can relate to it through communication. Stories and one-click
are other features that are of importance. It means that the user gets a stepwise guidance when
using the system and is also faster to use.

IBM offers outstanding capabilities that make it perform its tasks effectively. One such
capability is the automated recovery of information. This means that the user is able to get the
information instantly and also retrieve the information at any point needed. On the other hand, a
user is able to create a personal account that enables him access to the information at any time.
This ensures safety and privacy in the information of an organization or individual. An
organization or a person will want his important information protected from hackers or any other
harmful thing, and thus, IBM analytics is capable of that.

Considering the benefits exhibited by IBM analytics, a well-established business needs to
have one such system. With the bulk of the data generated in most organizations, an analytic tool
is needed to reduce the workload that staff might experience. Businesses and organizations will
easily make decisions pertaining growth of the organization. Apart from the big organizations
and companies, middle class businesses need to embrace the idea because it is easier to set it up.
All that one needs is to create an account with a username and password to allow access to the
information generated.

IBM Watson analytics needs to expand its coverage to other fields. It concentration on
more businesses has left out other fields. With the popularity and the quality of services the
company offers, it needs to find ways of incorporating other fields that are not business. With
this improvement, more companies and organizations gain the opportunity of making work easier when it comes to effective and productive decision making.

8.0 Future Research

The project primarily concentrated on the capabilities and features of the IBM Watson analytics and the advantages that an organization receives when using the system. The project does not mention the disadvantages the system can bring. I believe each system contains advantages and disadvantages that make people choose other systems over it. I would be interested in finding out more about the challenges the system brings to an individual or an organization, and the possible sources of the challenges or problems. The project gives a clear picture of what is entailed and any reader will be concerned on whether there are challenges brought about by analytic systems.

The main statement of problem for the project would be the disadvantages of analytic systems and their sources. The discussion and the research for the future will give a clear picture of what the users might face when using the system. On the other hand, identifying the source of the problems will give the user an idea of what to do. Other organizations will consider putting in place risk analysis and management processes. The early preparation and prevention of the problems make using the system very easy. In addition, having an insight on the possible challenges and preventing them early enough makes an organization stay focused on the goals and objectives set. Problems experienced along the way disrupt the normal functioning of an individual or business. Therefore, looking further into the challenges and possible sources might help reduce the inconveniences that might come up during work, thus affecting effective and efficient decision making.
Work Cited


Data Analytics Helps Business Decision Making


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