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Data mining for industrial development

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Abstract
Data mining is widely used in diverse areas. This technology has a strong consumer focus – retail, financial, communication and marketing organisations, to drilldown into their transactional data and determine pricing, customer preferences and product positioning, impact on sales, customer satisfaction and corporate profits. With data mining, a retailer can use point-of-sale records of customer purchases to develop products and promotions to appeal to specific customer segments. In the present context, an association rule tells us about the association between two or more items. More Data, bigger study platform, has better study results, which in turn leads into developed business industries. Nowadays, with the current information transfer platform around the globe, one can never live a day existing in isolation. The article also deals with data privacy in such a way so as to perform data mining algorithms effectively without compromising on the security of sensitive information.

Keywords: association rules, data privacy, text analysis, text mining, web mining

1. Introduction
This document is a detailed theory on data mining and and it's various applications in the industry. In other words, it can be stated that data mining is mining knowledge from data. These days, industries collect a large amount of data on sales and customer shopping history. The quantity of data collected continues to expand rapidly, especially due to the increasing ease, availability and popularity of the business conducted on the web or e-commerce. The retail industry provides a rich source for data mining. Use of the technology in the organization increases the competitive advantage of the firm based on the growing competition in the world of business. The big concern is developed in every organization for taking research on highlighting problems affecting the company. Thus, this research paper examines the effectiveness of using big data analytics in adjudicating the difficulties of the business. Furthermore, the research paper stresses on the disputes and opportunities of using the deep data analytics. Organizations use the research strategy for their production plans and also in making different strategies of the business.

2. Big Data in Industrials (Manufacturing)
Big data and analysis has greatly impacted industries and it can be currently see that numerous governments and private sectors promoting data based industries. Big Data Analytics has been given the term as the 4th Industrial revolution due to its massive impact in shaping how industries conduct their business. Today many initiatives are based on knowledge intensive collaboration through Internet of Thing (IoT). It's similar to a system of combined cooperation where profit is earned through data sharing.

3. Signifigance of Data Mining
The research has great importance in the industrial estate for enhancing the productivity and the effectiveness of the development department. The big data analysis plays a crucial role in disclosing many big decisions in the field of business dealings (LaValle *et al.* 2011) [8]. Moreover, the big data analysis will be useful in verifying the datain terms of its'accuracy. It further enhances the opportunity of the business to understand the deep knowledge about certain criterias for introducing any phenomenon in the organization (Brown, Chui and Manyika, 2011) [3]. Furthermore, the research is highly significant in determining the important variables to reveal the logic for creating the interactions between the direct and indirect variables. In addition, the research has its significant impact on the societal role for analysing different determinants that have the influence in changing the environment and cause benefit to all of us (Agrawal, Das and El Abbadi, 2011) [2].

4. Big Data Analysis and its impact on the Industrial Revolution
It's similar to a system of combined cooperation where profit is earned through data sharing. Application of Big Data on various industries are expected to have positive effects. Electrical companies can use smart meters to measure the power consumption.

5. Development
Data gathered through the analysis, can be further improved by utilizing the analysis process results. Moreover, the adoption of Big Data enhances the chances to think out-of-the-box and improves the economic conditions through the utilization of the appropriate data of a particular population. With the advancement of big data analytics in the business world, many organizations are commonly using it for moving from data extraction to advanced analytics (Davenport, Barth and Bean, 2012) [5].
According to the survey conducted by Russom (2011) [11], it

proposed that in the previous 12 months of conducting the survey companies are continuously moving towards the analysis of data for making any decision because the decision taken on behalf of the collected data will provide the best results. About 10% to 25% of the surveyed companies get successful result while surveying and implementing the big data analytics. On the other hand, about 50 to 70% of them are planning to take this initiative as their major strategy business decision making. However, adopting the analysis of big data is always a difficult decision for organizations to make, due to the high-priced advanced technology necessary to rectify the overall process (Agrawal, Das and El Abbadi, 2011) [2].

6. Challenges of Utilizing the Big Data Analytics

With it positive sides, big data analytics further faces the major challenges in dealing with the security issues and others which disturbs the decision making process. The constant research on that issue elaborates that the large and complex data is the biggest challenge for businesses. That minimizes their learning opportunities, which in turn makes propose new strategies for extracting and analyzing new data. Furthermore, the high cost for evaluating the big data is a major difficulty for any organization (Wang and Wiebe, 2014) [13]. In addition, the management also faces difficulty in dealing with the big data problems including the identification of the quality, velocity, veracity, inflexibility, explosiveness, and volume of the selected data. Other challenges include the selection of the best techniques to analyse data and others are the privacy and security of the target population (Tene and Polonetsky, 2012) [12]

How Big Data Can Impact firms and their strategic decisions

In this research, Small and Medium Enterprises' (SME) business strategies will be analyzed and discussed, comprehensive focus will be detailed on how it will affect their business strategies and how they can be moved closer to the Big Data Platform.

Big data is great news, and expansive organizations in all segments are making noteworthy advances in their client relations, item determination and improvement and ensuing productivity through utilizing this important ware. SMEs have turned out to be moderate adopters of the new innovation of big data analytics and are in risk of being deserted. In Europe, SMEs are a crucial piece of the economy, and the difficulties they experience should be tended to as an issue of risk.

SMEs are falling behind in the use of business and big data analysis. In 2012, the reception rate of big data analysis among UK SMEs was just 0.2%, contrasted and 25% for organizations with more than 1000 employees (ae-skills UK 2013) [9]. The market examines expect a yearly development rate of the worldwide SME big data advertise by 42% over the time of 2013 until 2018. However, in light of the fact that they are beginning from a definitely low level, big data selection in SMEs will keep on lagging behind the advancement as compared to bigger organizations (TechNavio, 2014).

7. Data Protection Laws in Oman

As far as the data protection law of Oman is concerned, the law does not have sufficient and suitable measures that assures protection of the personal information of the users who opt for these services. As of today many governments, private and civil institutes conduct business online. These business activities lead to the collection and processing of personal information gathered through their services. An example of such services is the Ministry of Higher Education. The Ministry collects various information such as their names contact details and bank account details. Non-profit organizations also collect this information and are mostly well intended with legitimate reasons to provide services to their customers.

But due to the lack of any sort of reliable data protection law in the Sultanate, data collected through these services can often lead to harmful results. For example, if data from the Ministry of Education is hacked then the criminal can extract sensitive data and impersonate their victims. Laws in Oman do not provide a detailed guideline to curb the obligations of organizations that collect sensitive data. Although there are some specific laws such as the Electronic Transaction Law, but this law only applies to those that deal electronic transaction, but not in the collection of data. AnotherlLaw which is the Cybercrime law protects an individual's privacy using technology, but it does not provide laws against those who collect information. The Information Authority Technology (ITA) has planned in previous years to implement a data protection law, but currently no progress has been revealed about its status. Data protection law is an integral part in any community and is especially vital for citizens of Oman, now that interactions and businesses are reliant on online services. (Aziz, 2016).

After collection of data (useful), it can be synchronized on larger scale. This is analogous to a mining operation in which large amounts of low grade material are sifted through in order to find something of value.

8. Governments

Data mining helps government agencies by digging and analyzing records of the financial transaction to build patterns that can detect money laundering or criminal activities. Good international and regional relations, strong global assessments of the business environment, and equipped armed forces in the Gulf region helps the economic growth of Oman. The State Council chain launched a national big data lab to help improve government management efficiency. Besides, the government boosts the digital market in support of the economy by allowing to monitor government websites which provide industrial services.

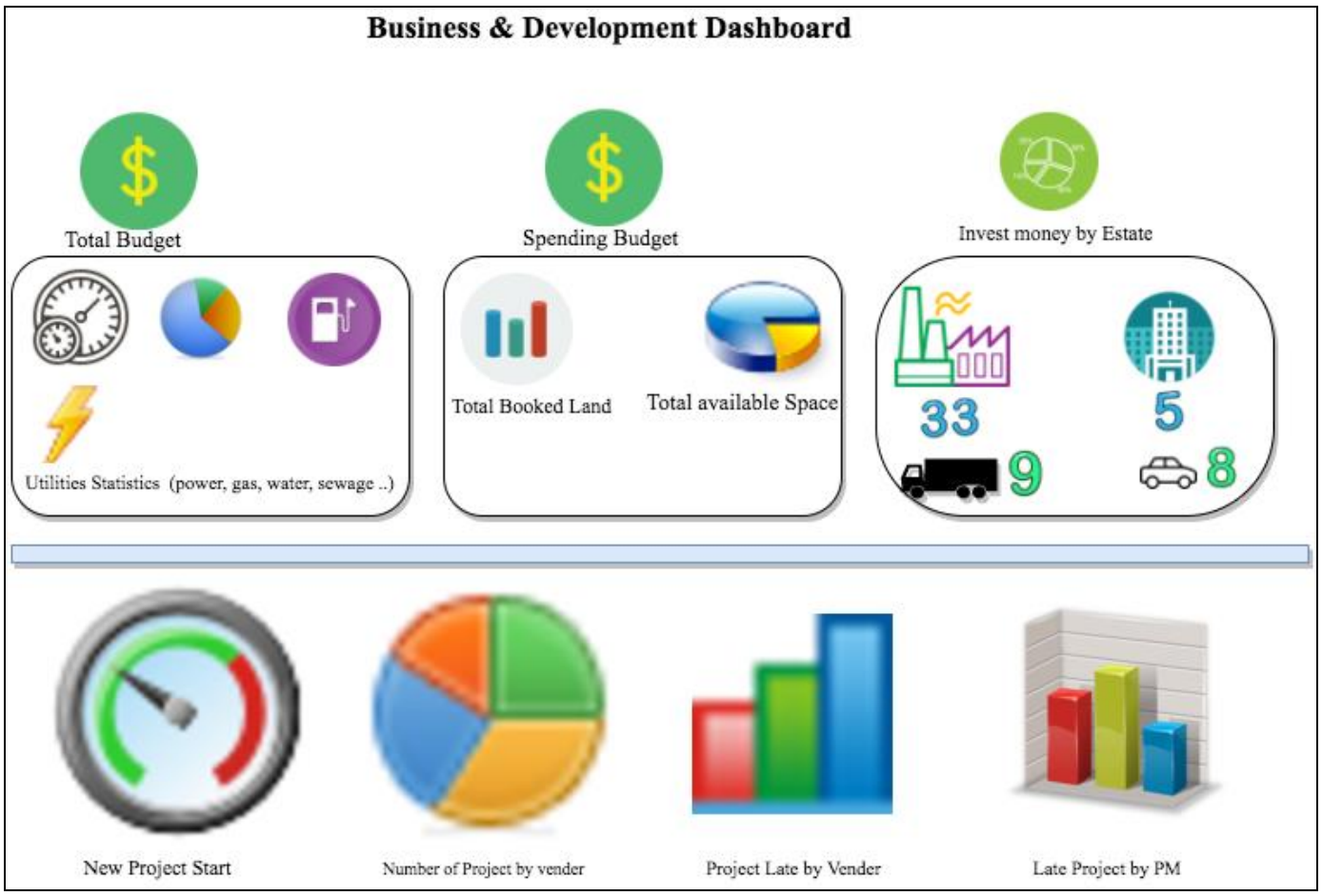

Fig 1: Business & Development Dashboard

9. Benefits of the Business Development Dashboard

- The dashboard gives clear picture about your customers behaviors and where they intersted and ready to invest. By using Internet of Things (IoT) devices, it will provide real-time figures of number of visitors, cars and tracks in each real estates
- By using Smart meters, it will provide real-time statistics of utilities usage in each estate besides the dashboard shows indicators for each utility capacity thus give long term infrastructure planning.
- The dashboard must provide measurement factors and tools, which would ease ROI forecasting, as well as calculation

Based on data shown in the dashboard, business departments must be able to change their strategies to maximise business benefits

- Dashboard should assist in customer clustering and segmentation
- Using online analysis tools, such as google analysis tools, to analyze PEIE website traffic information, as well as visitors' feedbacks.
- Using different Parallelization tools that help in extracting social media trends, comments, reactions and hashtags. Then exporting these data into dashboard.
- Investing in big data analysis system, which complies with worldwide business standards, based on ISIC codes. This would ease any future business opportunities local as well as international.
- Big data provides analytic real-time integration for PEIE can monitor land/office request in different industrial Estates and electricity usage each day in factories, number of cars/tracks, goods export& import and payment transactions.

10. Conclusion

Data mining is a necessary method that businesses and corporate institutions use to further develop their decision making. Furthermore, data mining results have allowed these companies to extract precise results that allow them to use to develop their strategies as a trading body. Effective data mining analysis allows them to undertake new opportunities based on real time and precise results that gives them a real idea of what is happening to then further on use this for careful decision making.

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