Impact of Data-Mining and Data Warehousing on Business

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**Abstract**

This research report the overall role of data mining and data warehousing in the operations of business or businesses. In the current business environment, data mining and data warehousing are the key and major part of business operations. The concepts of data mining and data warehousing have made the businesses capable to meet all of their business targets, achieve their financial targets as well as bring improvement in the performance and operations. Furthermore, these concepts have been found useful by a number of businesses (even all) in the entire world for enhancement of target markets, segments and number of potential customers. This report and research further clarify that who and how the concepts of data mining and data warehousing are crucial for any type of business or organization. The paper is keenly focusing on the overall impact of these two concepts on business. For this purpose, the study and paper review the past studies, literature about business efficiency because of implementation of data mining and data warehousing concepts. The report also analyzes how these concepts can improve the business operations of LAH incorporation. In other words, the paper analyzes that how LAH and its business can get benefit from the implementation of the concepts as well as how it can help the company to improve its business operations and perform better. Additionally, to the study, some of the critical issues or problems regarding the implementation of data mining and data warehousing are also analyzed and discussed.

**Data Mining**

Data Mining is the critical process in which the hidden data and information are gotten from the piles of the database and used for the analysis purpose(s). In short, it is the process of extracting the data from both large and small database for some specialized purpose or work.

The concept of Data Mining is used in a number of applications like product and service analysis, understanding marketing research and customers’ preferences, analysis of demand and supply, investment analysis, return analysis, budget settlement, e-commerce, communication, and many other applications. The concept and operations of data mining are based on analytical skills and mathematical algorithm that is used to drive the expected and desired results and outcomes from the huge database collection (Doug, 2019).

Data mining involves the process of analyzing and exploration of larger blocks of data and information to gather meaningful and useful trends and patterns. The results can be further used for the purpose of risk management, marketing purposes, detection of frauds and many other uses.

The process of data mining is usually broken into five major steps or stages. These steps are;

* Firstly the organization gather all data and load it to their data warehouse for the desired purpose.
* In the next step, the organization or business should store their data in a secure place like the Cloud or In-House Server.
* The next step is the management of the team and professionals who will be involved in the process. In this step, the business analyst determines how the team(s) and professionals access the data as well as how will organize it.
* Then the specific software sorts the data on the basis of results or outcomes of the user(s).
* The final steps are the end user present the data and results in an easy to share formats like table or graph.

**Data Warehousing**

Data Warehousing is the collection of all corporate information and data gathered from all operating systems as well as other external data sources. Data Warehouse is developed with the purpose of generating or developing critical business decisions through allowing data analysis, data consolidations and reporting at altered aggregate levels (Bose, 2018). Extraction, loading a transformation are the ways through which the data is populated into a data warehouse.

Data warehousing integrates stores of data as well as all logical, conceptual and physical models and prototypes to support the goals and objectives of the business or organization as well as meets the needs and expectations of the end user(s). Development of Data Warehousing needs structuring data targets and sources, then catching all the facts of transforming in metadata fountain or repository (Zaki, 2018).

The process of Data Warehousing conglomerates and combines the collected information from different sources in a single detailed or comprehensive database. For instance, data warehouse gathers all information about customers of a business from the mailing lists, website and other sources of the businesses (Bose, 2018). Confidential information like details of a company’s employees or other financial information may also be considered in the data warehousing. Business users such information for analyzing their target and potential customers. Data warehousing has also the relation with data mining which is meant to look for useful and meaningful data patterns in a large data volumes and develop new and strong strategies and tactics for generating higher revenues, making higher profits as well as to make more sales than existing sales volume of business (Dawood, 2019).

In addition, data warehousing matters a lot in business operations, companies with having strong and effective data warehousing systems thinks a way ahead than others in terms of marketing analysis, product analysis, pricing, and promotion analysis, product development, production analysis, and historical analysis as well as customer satisfaction (Dawood, 2019). Sometimes, data warehousing can be found an expensive process to design and implement but it adds a lot to the efficiency of business operations in many terms.

**Data Mining versus Data Warehousing**

 There is a number of components which distinguishes the role of data mining and data warehousing and their different impacts on the business and operation. Some key differences and benefits are;

1. Data warehousing helps business in storing user data or information while data mining helps business in taking both major and minor decisions (Haroon, 2018).
2. Data warehousing is usually started at the beginning stage of any project or process while data mining is done as per demand or request.
3. The availability of data depends on the supported load of the warehouse while data mining does not bring any issue or problem like this.
4. There are a number of analytical algorithms available for mining the data if the professional has deep knowledge about the data and use of the tools (Haroon, 2018).

By looking at the different benefits which data mining and data warehousing provide to a business, the following comparing table clarifies the thoughts.

|  |  |
| --- | --- |
| Data Warehousing | Data Mining  |
| Faster and quicker access to the data | Quicker processing of the data |
| Improved system performance and operations | Enhanced throughput |
| Easy and relaxed data handling | Easy and convenient to produce a report for analysis  |
| Data Integrity | Analytics of the data |

In details, the difference between Data Mining and Data Warehousing is data warehousing stores the data from several databases and provide the data for different purposes at any time. All of the data has been cleaned after it has been received from multiple sources because of its format and structure differences. After this process, the data has been assimilated to shape and form commonly available and integral available data store.

The process of data mining is done on the currently available data to generate results for decision making. It is done to gather the scenario as well as to get the knowledge and facts about the business. The states after data mining provide a clean and clear picture of the trends and facts and figures.

**Literature Review**

There is a number of studies, analyses and researches have been done about the impact of data mining and data warehousing on business or business operations and efficiency. These researches and studies have been done for several years. These studies have focused on a number of aspect regarding the point of impact of data mining and data warehousing on business. Most of the researches show that businesses have enjoyed a number of benefits from the concepts of data mining and data warehousing (Ramesh, 2016). Those benefits include all the hints for business efficiency and performance and operations improvement. From a number of years even decades, the concepts of data mining and data warehousing have helped the businesses to perform better than without having such concepts as well as to empower all of operations and procedures of the business (Inmon, 1996). These concepts further help businesses in introducing new strategies and tactics to perform better business operations and give insights to the businesses to know that facts about your customers like and dislikes, their needs and expectations as well as their buying behaviors.

A recent study states that the using the concept of data warehousing made businesses and companies able to gain higher customers satisfaction. As the customers’ satisfaction is an extremely important things for every business or company if they want to get succeed in long term, the data about customers and their feedbacks is very important to be kept at hand. Data warehousing is the way which provide the source to keep all these information and data for any decision(s). Data warehousing helps businesses and companies to keep an eye on the trends, market and industry and take all the decisions perfectly and accordingly (Inmon, 1996). As well as it helps to make changes in the existing strategies and tactics (if necessary) to enhance customers satisfaction and grow your business effectively and earn higher revenues and profits. In this way the concept of data warehousing has huge impact on the performance of business (Ramesh, 2016).

Another research shows that in the present competitive business environment, no business can run its operations without having proper and highly effective information system and business intelligence as well as strong market and industry research. But the system is required to be designed in a way which makes available all the data at the required time for any purpose while the data should be fine, accurate, realistic, actionable and implementable for the required purpose, so that the business would be able to perform efficiently and in a better way (Ramesh, 2016).

These concepts (data mining and data warehousing) further enables the business to improve the skills and capabilities of each staff members and engaged in every new and advance technology and patterns. Additionally, data mining and data warehousing do not only have better impacts on businesses while these concepts play a huge role in making other sectors efficient. The sectors include but not only, health care, security, government, non-profit organizations, and many other sectors (Inmon, 1996).

A study shows that data warehousing is an association of data which is developed for the purpose to support the key decision-making process of organization or business. Further, the core benefit of data warehousing id the provision of a very clear and concise picture of the organization os business at a particular time which can be used for effective decision making which will further lead to the success of the business or organization.

Another study emphasizes that business intelligence is the technique of describing a full set of methods and tools which transform data into useful and meaningful information which is used for business improvement and efficiency, so data mining and data warehousing concepts strengthen the tool of business intelligence (Eiad, 2013). Beyond that, data mining and data warehousing are the concepts which help the business to design highly systematic techniques which highly efficient and useful so that they might be found the most useful for any business improvement purpose. In the current competitive business world, no business or organization can run its business operations without having s strong business intelligence practices and deep market research. So the concepts are used for the purpose to provide actionable and realistic as well as fully perfect statistics to grow and perform in a way that leads to gain a competitive advantage in the industry as well as in the market place.

There are number of problems and issues incorporate with the concept of data mining, which have been found by many professionals as well as by the researchers. The core and highly critical problem is the amount of time which the data selection process takes as well as some crucial processing steps. The selection of data is a key action which is always required to be taken very carefully because it decides the effectives of business and its operations while these steps and data collection is mostly done through automatic resources (Edureka, 2014). So in this case, the researchers suggest that the organization or business needs to involve highly professional people or individuals in such activities instead of completely depending on automatic resources.

The concept of data warehousing has a huge role in making businesses to make strong and successful business decisions. This has been done by the provision of any kind of required data and information from the sources for taking any of the decision. In this way, the business becomes able to work on the identifications of its strengths, critical weaknesses, potential opportunities and crucial threats from the external environment. As well as work on the strengths to utilize all the potential opportunities to gain success as well as turn all of the threats into opportunities for future growth and success. Beyond that, it also enables the business to identify its weaknesses and work towards improving such areas and to convert their critical weaknesses to highly competitive strengths (Edureka, 2014).

Beyond above, information system (concepts of data mining and data warehousing) is used in many other industries like hospitals, public services, and health care industry. Based on a research in the public services industry, it has been found that all of the operations and processes would be more effective and strong if all players of the industry give focus towards the concepts of data mining and data warehousing. These concepts and their efficiency can improve the operations of overall industry. It can help because the concerned organization would have full data about the public as well as they would have way to analyze the data for any purpose they want. So they could contribute a lot to the society’s or community’s well-being. While in terms of health care industry, most of the bodies (even all) have adopted the use of information system to provide the most convenient and high quality services to the people and community (March. & Hevner, 2007). This has been found as an excellent steps of all players of health care industries by most of the researchers.

In terms of financial and management benefits, several businesses and companies have implement the practices of data mining and data warehousing. They have adopted the practices and still using them for the purpose to improve their business performance and make more revenues as well as to develop a highly effective and efficient management system inside the company (Watson. & Wixom, 2007).

**Impact of Efficient Application of Data Mining on LAH (IT Company)**

A recent research state that data mining can be found a useful concept for businesses to avoid the factors which lead to increase in miss happenings and critical mistakes that happen in the operations of many businesses around the world. These mistakes may misjudgments of customers’ preferences, wrong targeting, and selection of a non-potential segment or region to be targeted by the business or consideration of wrong stakeholders as key stakeholders (Business Impact, 2015). So these things may happen with LAH and its management. In this case, data mining is the crucial and highly beneficial concept which can be found useful for LAH to keep itself away from such wrong decisions or deeds (Dhingra. & Chaudhry, 2019). In addition, data mining can help in this case by providing fully perfect information for decision making at any time and about any matter. As well as it provides insights into the management of LAH that what could be the result if a wrong decision has been taken.

Proceeding forward, data mining can help LAH in forecasting its future sales based on past information. In the case of sales forecasting, data mining can help LAH to look at the time that when the customers make purchases and predict on that basis that when they might be purchasing in the future (Jyoti, 2019). In this way, LAH can develop relevant and appropriate strategies for the future to figure out the expected sales in the future. In this LAH will also look at the information of potential customers like a number of potential customers, their needs, want and expectations, their preferences, their buying behaviors, their lives standard and their likes and dislikes. Such information about customers can be gathered only if LAH has strong data mining as well as data warehousing systems.

For LAH the best use of data mining is the segmentation of its target market. In this way, LAH can divide its target market(s) into different pieces or segment on the basis of age, gender, income level, buying behavior, preferences, occupation as well as geographic and demographics. This (segmentation) can be done in an efficient and successful way if LAH has all possible data about its markets and target customers. By looking at this factor, the impact of data mining can be found very huge and positive on businesses or companies like LAH.

Beyond above, the concept of data mining has a huge impact on the operation of LAH in terms of increasing profit, boosting current revenues, enhancement of existing operations and their efficiency and reduction of costs. These benefits can be exercised by the company because data mining and its advanced software have enabled thousands of businesses to gather data and analyze for their particular purposes accordingly.

There is a number of considerations which should be kept in mind while making a decision or developing practice. Most of the times, some decisions are required to be made promptly and on urgent basis because they are required for a specific purpose and a specific time, but sometimes decision makers fail to make such decision in the required deadline or time frame (Zeel, 2017). This mostly leads to failure in a certain aspect of business operation and the same case may be happened by LAH anytime.

So data mining is the concept that provides required data and information as needed at any time. So if the decision makers get the data at the exact time then they may not get failed to provide what has been asked.

**Impact of Efficient Application of Data Warehousing on LAH (IT Company)**

Confidentiality of data and information are highly crucial things for every kind of business or organization. They have to keep all un-sharable information fully confidential and secure in any situation and at any cost. So same importance for LAH and for this purpose (information security and confidentiality) data warehousing concept is extremely useful for LAH. As data warehousing stores the data in the server or cloud, it can be the one source that LAH always have to keep its data and important information fully secure. Beyond that, with the help of data warehousing, data or information can be kept secured by the organization (LAH) as well as management can get that data or information any time when they go towards making a business decision. The efficient application of data warehousing adds a lot to the success of every company or organization especially IT Companies (Dhingra. & Chaudhry, 2019). Data warehousing plays a huge role in business improvement as well as empowers the existing operations and performance.

In terms of LAH Company, the efficient application and implementation of data warehousing can contribute a lot to the performance improvement of the company. Some key and crucial contributions are;

**Enhanced Business Intelligence**

In the last few months (a year) there was an issue which has been faced by the managers and directors of LAH Company. The issue was that they had very limited information while they were taking theirs about the implementation of new IT practices. So the efficient application of data warehousing can free up managers and directors or other decision makers from limited data and information and they would have all the information, facts and statistics while making any decision(s) (Ahmed, 2004). So if the management and decision makers have all the information available for decisions making then they could make any successful and effective business decision at any time they have to. So, in this case, the efficient application of data warehousing can help LAH in performance improvement.

**Enhanced Query and System performance**

Data warehousing is the concept which is majorly designed with a strong focus on the retrieval of data for analysis. So in case of the efficient processes of data warehousing, can help in the development of the enhanced and increased system and query performance. As well as the efficient application of data warehousing allows the LAH Company to have fully timely access to the data for decision-making purposes.

**Improved Data Quality and Consistency**

Enhanced and improved data quality and consistency of data are the key consideration while analyzing the performance of any organization, company or business. Data warehousing and its implication can help LAH to enhance the quality of the available data. This is possible if the LAH has all the data in the data warehouse. So if the company has all the data at hand then they can look at weak areas and can work to eliminate these weaknesses and improve the quality of the data and keep it consistent (Ranjan. & Bhatnagar, 2011).

**High Return on Investment**

Return on investment refers to the level of increase in the revenues of an investment or level of decrease in the overall expenses of a project or plan in the process of implementation. So if you or the company has all the data available which can be used to determine the expected revenues or level of expenses, then the company or decision-makers would be able to make fully perfect and relevant decisions accordingly. This will help the organization to enhance the level of revenues to the possible highest level and decrease or reduce the expenses level (Anandarajan. Anandarajan. & Srinivasan, 2012). Expenses level can be reduced by the development of strategies which will help LAH to eliminate all extra costs and expenses. In short, the increase in Return on Investment leads to overall business improvement of LAH.

**Best Software(s) for Data Mining**

The process of data mining cannot be found as a simple while it is a critical and highly technical process which needs several expertise. The concerned person or professional must have full knowledge about the process of data mining and must be used with the most common software for data mining.

Beyond that, there is a number of software available which can be used for the purpose of data mining. But the most useful and highly efficient software which have been found well-working all the time are; Oracle Data Mining Software, Sisense data Mining, SAP Business Object, MS SharePoint, Dundas BI, Board data Mining Software, SPSS Modeler, Sales-force Analytic Cloud and number of other effective software. All of these mentioned software has different features and capabilities because of which they have been used by the companies and businesses of different natures. Like Sisense can be used by the companies or business which analyze their available data from several resources and develops highly applicable and useable reports which they share in their departments for making both small and large scale business decisions. While Oracle Data Mining software is used by high level and large scale companies who serve as the market leaders of their industries. They use this software for prediction of future growths and sales as well as success in the market and industry. The analysis of this software provides information to target fully fine and highly potential customers, target productive segments and markets and identify all selling opportunities in the marketplace (Madhuri, 2019).

**Companies Using Data Mining and Data Warehousing Concepts**

As found in the entire report and after the analysis of the impact of data mining and data warehousing on businesses, these concepts and their utilization has added and add a lot to the success of businesses. So there is a huge number of companies which use data mining and data warehousing concepts. They use these concepts for the purpose to improve inside management, operations, improve decision making, empower business strategies, gain loyal and higher number of customers and make higher revenues.

Some companies which use these concepts very highly and critically are;

* Amazon
* Google and CDC
* McDonald’s
* Netflix
* Starbucks
* Walmart
* Arby’s
* Delta
1. Amazon uses data mining concept through their App which is named as Amazon Price Check Mobile App. The company gathers pricing information and inelegance from its major competitors.
2. Google uses a new approach which is they use historical data from the CDC and then process it through data mining for decision-making purposes.
3. MacDonald's use large data analytics approach for the purpose to improve their existing operations and expand the business operation to new regions and markets by knowing the actual facts and figures about the markets or regions (Alexandra, 2017).
4. Data mining and Data warehousing have a key role in the business success of Netflix. They use these to store data and analyze to know that what makes movies and shows popular as well as they have huge success from utilizing these concepts.
5. It is enough risky to open a new branch or business block in new or existing place. Starbucks uses data mining and data warehousing concepts very hugely when they go towards any step regarding opening a new store or chain. By having all the information, the company opens new stores while they confidently guarantee an impressive and higher success rate.
6. Walmart uses data mining for the purpose of generating highly relevant and appropriate search results about their business concerns. They do this through their in-house designed platform which is known as Polaris (Alexandra, 2017).
7. Arby's is one of the leading fast food chains, which use data mining and data warehousing to help the company to determine the finest targets of their marketing and advertisements. They have very successful past experience regarding what advertisement the most effective, while ensuring the aspects of related costs and expenses (Barbosa, 2019).
8. Delta (an Airline company) uses these concepts to know the feedbacks of the customers' regarding different issues like flight delays, entertainment, and upgrades (Alexandra, 2017). In this way, they act according to each feedback of the customers especially to negative feedbacks which leads to improvement of their operations and customers’ satisfaction.

**Conclusion**

After the deep analyses of every aspect of the impact of data mining and data warehousing concepts on the business as well as the impact of efficient application of these concepts on LAH Company and its operations, it has been found that the impact is very fruitful, positive and huge. Furthermore, the impacts of the concepts are very positive which are; improvement of business management, decision making, organizational processes and practices, enhancement of customers’ satisfaction and increase earnings level. In short, data mining and data warehousing can add and have added a lot to the success and business improvement of LAH as well as they have been found effective and productive concepts for the success of any kind of business or company if implemented efficiently.

In addition, some successful companies have been listed which have enjoyed the benefits of using data mining and data warehousing concepts. The companies have been listed as an example for LAH that in these ways, the efficient application of data mining and warehousing can affect (positively) LAH too.

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