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ABSTRACT

The scope of modern business is growing at a very high rate with the continued growth and development of new technology. The growth of the business has relatively led to the increase of data flowing and out of an organization. The bulky data requires a proper storage arrangement and sorting to ensure its reliability to the organization. Data warehouses have stepped in to help in ample data storage and sorting [1]. The decision support system has been key in the way data warehouses are implemented and maintained. The decision support system has the role of digging the sense out of the stored data for informative and correct decisions to be made. Data warehousing focuses much on data organization and architecture; that is why it is a significant aspect of data mining

KEYWORDS

Data Warehousing, Decision Making, Decision Support Systems

1 The Four Stages of Data Warehousing

Data warehousing mainly involves four stages: first, Offline Operational Databases- Primarily the storage of data in an offline server. Second, Offline Datawarehouse- This is whereby data from operational databases are constantly reviewed and updated to meet the need and set goals of the data warehouse (Aftab et al., 2018). Third, Real-time Data Warehouse- The data warehouse updates every transaction in real-time. An example is when an order is made, and the transaction is done from an online outlet. Fourth, Integrated Data Warehouses- The data warehouse is simultaneously updated with each transaction and then returned to the operative system.

2 Why the use of Data Warehouse and decision support system?

The traditional forms of data storage and management had many loopholes. Data used to be stored in the form of hard copies, which were subject to very many risks, including minimal privacy, prone to theft and damages, etcetera. Due to such issues, the modern business intelligence concepts to come up with more sucre ways of data storage. Being the era of the Internet of Things, priority was given to how best to use technology to enhance data storage and management. The idea of data warehousing has been there since the 1980s, but its actualization saw the light in the 19th century due to the revolutionized digital way of doing things.

The key areas that data warehousing implementation has taken place are the marketing and finance platforms. The aspect that a data warehouse can draw data and information from both internal and external platforms explains its roles in the business world [3]. Data warehouses are used to analyze market trends and track business transactions most efficiently ever. Generally, in a data warehouse is sampling taking up are an aspect of management. An example, we can have a look at the use of data warehouse in the following scenario.

Datawarehouse is used in the health sector to help predict outcomes and give patients medical reports. From data warehouses, we get to understand the actual situation in a health facility, such as the number of patients admitted, and the medications needed at the facility.

Banking industries rely much on data warehousing to predict the client market and track the institution's financial transactions. It is also the tool used for resource allocations, especially on the customer service agents' desks.

The public sector uses data warehousing for intelligence collection. Government revenues such as taxes are tracked using data mining techniques [6]. The aspects ensure that the records are clear, thus giving a much easier way of record tracking.

The telecommunication industry integrates data warehousing in almost all its aspects. Starting from sales to data information storage and transmission, there is the extraction process involved. All this can be pointed back to data warehousing.

A simple explanation of some of the critical roles of data warehousing in the current technological world can be summed up in the functions.

Data extraction- whenever one needs any information or data, there must be a procedural way to do it. At this juncture, the data warehouse shall intervene and save the user from the tedious process of having to go through the whole data back [6]. While using a data warehouse, Operator only needs to key in the specific attributes of the type of data needed, and it will appear.

Data cleaning- many organizations, prefer regular cleaning of their information in their databases to avoid redundancy. It is

usually done through a data warehouse as it is easy to sort data from that point.

Data transformation- in the data warehouse, data is converted from legacy form to a less complicated form. Some of the big data come into warehouses in encrypted nature, which is hard for some users to read or understand [7]. Within the database, the data can be transformed from the coded language to a more easily understandable version. An example is the back code of an application stored in a coding language and can only be decrypted in a data warehouse to give a more straightforward explanation.

3 Benefits of Data Warehouse

Up to 90 percent of the current business organization have opted and adapted to data warehouses in their daily operations and management as it offers the below benefits.

3.1 Better Data

The consistency of data in a data warehouse is assured. A data warehouse can evaluate the reliance on incoming data and filter out what is not essential. Business intelligence tools are mainly used to analyze the data to ensure that only required data finds its way into the data warehouse.

3.2 Faster Decisions

Implementation of data warehouse in section three explained the process of setting up warehouses. The data warehouse architecture is consistent to the point that databases can be easily accessed and analyzed. It also provides the chance for complete data sets that can be used in decision-making. Faster Decisions

4 Decision Support System

It is the backbone of a data warehouse in that it helps data warehouse users to make an informed decision. When it comes to business, an action map must be drawn indication of the reason for one deciding to take a particular decision. The decision support system sifts through many data to give a comprehensive and fathomable explanation during decision making. In an organization setup, the system is commonly used by the planning department [4]. The department collects and analyses data to present to the manager, who is responsible for making decisions.

5 Components of Decision Making

There are primarily three components of the Decision Support System (DSS) framework, namely.

5.1 The Model Management System

The model contains information data of the specific business organization. Managers use the information to develop a favorable decision as to its operation in the organization [5]. An example is in the case of a supermarket that has a model database for all its products and services. The decision support system will constantly review the market trend to see product and service prices variations. The reports retrieved from such information s are key guiding the managers in determining the set prices of the supermarket's commodities.

5.2 User Interface

These are the tool that enable the user to make conclusions of their research. Anything that can lead to informed decision-making is put under this component, be it audible, touchable, or visible.

5.3 Knowledge Base

The concept is based on or built on information from a known source. The source is assumed to take the lead in guiding the person involved to make the right decision. An example is the advertisements that are placed in newspapers or magazines. The advertisements outline the required qualifications, thus guiding the applicant on what should be done.

5.4 Communication Driven

The component mainly involves teamwork ideas and goals. A business organization brings together all the sharp minds of the staff to brainstorm on a particular matter. The decision reached or agreed upon has worked best for the most organization as two or more minds are better than one.

5.5 Document Driven

In this concept, decisions are arrived at by following a written outline or document. The information given can be structured or non-structured, so it is upon the people involved to decide how they will use it.

5.6 Data-Driven

The concept of decision support relies on the data stored on the internal and external sources of the organizations. It is mainly used to facilitate the daily running of a business organization.

6 The key benefits of Decision Support System

It increases the rate of speed and efficiency of the decision made. DSS tools are helpful when it comes to making a faster decision as they can quickly analyze big data to come up with the best-required information. The results of information acquired through the system have zero tolerance to malpractice; thus, the results are reliably efficient [9]

The promotion of training in an organization can also be achieved via a decision support system. The coming together of

different entities of the organizations means that several skills and information are going to be shared among the staff [8]. It creates ample time for the staff to interact and learn from each other, hence building their knowledge and skills.

It promotes synchronous management of the business organization. As we all know, business management is a quite tasking thus need the input of each staff to make it a success. A decision support system brings together all entities of an organization to achieve common goals and objectives.

The decision support system is again very key in improving interpersonal communication skills within and out workplace. Working as a team to make decisions ensures that each person can share and put forward their ideas. The situation is key to building interpersonal skills as staff gets to interact.

The process of a decision support system does not come as easy as so many of us would expect. There are several challenges associated with the process, thus the need to highlight some of them. The development and implementation of a DSS are costly. It is one of the factors that has hindered many small organizations from using it. The capital investment in the program is very demanding. Thus, it requires a reasonable budget to achieve the same. It should not discourage the growing organization as each process has to begin from small investments.

Overreliance on DSS can be risky for the management since it robs away the opportunity to decide independently. The best method to integrate the program is to ensure simultaneous involvement of both individual and teamwork inputs.

DSS is also capable of information overload. The program considers all aspects of data, and this can be a bit tasking. Once the program has brought all the aspects together, the end-user is left to choose from the multiple choices given.

Implementation of DSS can lead to a backlash from the lower-level employees. The Operator will find that many low-level employees are afraid of the new technology and thus, they will feel intimidated while being subjected to the program. The advice in such a scenario would be that we all try to embrace the new technology as one way of pushing ourselves to the following levels.

ACKNOWLEDGMENTS

Data warehousing and DSS is the path that all business organization should adopt. The market has become very competitive. Thus, all organizations ought to brace themselves for the tough competition that is evident across the globe. The client and customers have also raised the bar regarding expectation levels as they need the best product and service delivery. Data warehousing must be taken as the remedy to ample data storage and management [2]. The tedious process of sorting data and information has been covered in data warehousing, making it less complicated and non-time consuming. The DSS program has come in handy to help in informed decision-making. At this error, there should be no attempt to decide from the blues or with no prior research. It is advisable to conduct activity mapping on every investment an individual or organization must make [10]. It helps avoid future snarls where a project must stall due to poor decisions made at the beginning of the project. Management information systems integrated with data house and DSS works quite well in terms of management. It is the aspect that all organizations should look forward to adapting for the growth and development of their business organization.

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