

Challenges of Applying Data Mining in Knowledge Management towards Organization

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Abstract

In today's business organization, the use of technology become more wider and data mining is one of the method in order to make business processes run smoothly. Data mining is the exploration and analysis of large quantities of data in order to discover valid, potentially useful, and ultimately understandable patterns in data. However, there are also challenges or limitations that prevent the use of data mining application in organization. The purpose of this literature and article review is to identify challenges occur when applying data mining in knowledge management towards organization. This study is significance to individual as well as organization in order to aware the challenges when applying data mining so that the works in organization become more effective and productive.

Keywords: Data Mining, Knowledge Management, Data Mining Application, Challenges, Organization

1.0 INTRODUCTION

With the growth of database software use and the warehousing of data in quantities, data mining is becoming the tools as a way to extract interesting patterns or relationship between data. For example, by using the data mining software or application, it uncovers relationship between data that would be missed using more traditional methods. According to Neha Purohit, Sapna Purohit & Ritesh Kumar Purohit (2012), they stated that data can be change or turn into knowledge but it depends on traditional methods because it relies on the manual analysis and interpretation. However, by applying data mining in organizations, there are also some challenges arise. As we know, nowadays most business transaction are more depends on technology. The more advance the technology that the organization have, the work of the staff will be more effective and efficiency. As for example, compared to using the traditional method, using the data mining are more effective. As we know, to handle the vast amount of data need to have high skills in term of controlling the data. This is because, once the data is missing, it is difficult to track back the data. So, the introduce of data mining is to help in handling the various amount of data. However, the use of data mining also has their own disadvantages.

Besides advantages of data mining, there are also some disadvantages that can occur from data mining since the growth of internet and technology become more advance. According to Jaseena K.U. and Julie M. David (2014), they state that the vast improvement of internet and technology has a crucial role in the increase of data creation and storage. Data

nowadays has growing exponentially, so the improved of large data sets is needed because the data need to be extract and analyse accurately in order to have required that best matches user interests. The purpose of this literature and article review is to identify challenges occur when applying data mining in knowledge management towards organization. This study is significance to individual as well as organization in order to aware the challenges when applying data mining so that the works in organization become more effective and productive.

2.0 LITERATURE REVIEW

Generally, data mining is defined as a process used to extract usable data from a larger set of any raw data. It implies analyzing data patterns in large batches of data using one or more software. Apart from that, data mining involves effective data collection and warehousing as well as computer processing. By using data mining, it allows us to understand what is relevant and then make good use of that information to assess likely outcomes, accelerate the pace of making informed decisions and many more. According to Wei-ChaoLin, Shih-WenKe and Chih-FongTsai (2017), in many business applications, the usage of data mining is necessarily used such as for effective decision making. As for example, techniques for data mining and knowledge discovery in data bases play an important role in many business applications and assist with the making of effective decisions.

Meanwhile data mining is also a tool to control or to manage a large amount of data. According to Yu, Haghghat & Fung (2015), since the emerging and advancement of technology, data mining is one of the tools in order to control huge amount of data such as to extract valuable amount of knowledge. As we know that data mining application is a statistics, databases and pattern recognition, so in order to address some issues regarding the information extraction in huge amount before, data mining is one of the tools. As a fact, many organization around the world has introduce the use of data mining because data mining can generate and collects vast amounts of data on system operation and many more. In research, many areas such as banking, medical as well as bioinformatics, their researchers has successfully applying data mining.

Data mining is the way to handle the vast amount of data effectively rather than using the traditional method. Through data mining, the extraction of large amount of data can help the organization to more focus on the most important information in their data warehouse (Folorunso & Ogunde (2006). It os true because data mining tools predict the future trends and behaviors, allow the business become proactive as well as knowledge-driven decision. Nowadays, most company already collect and refine massive quantities of data.

In order for company or organization to be more effective in certain things such as in decision-making, by implementing knowledge management can help them to become more productive. According to Greiner, Bohmann & Krcmar (2007), they have stated that knowledge management promises to help companies to be faster, more efficient, or more innovative than the competition as well as the term management implies that knowledge management deals with the interactions between the organization and the environment and the ability of the organization to react and act.

Managing knowledge is not easy. Managing knowledge can become the most challenging parts if we did not know how to handle or manage knowledge effectively. In order to avoid the challenges in managing knowledge, many organization nowadays has implement new technology in knowledge management to aid for creation, sharing, integration as well as distribution of knowledge (Silwattananusarn & KulthidaTuamsuk (2012). Relating to the topic, according to the author data mining is an essential part of knowledge management and data mining can be useful for knowledge management which are to share common knowledge of business intelligence (BI) context among data miners and to use data mining as a tool to extend human knowledge.

Then, in order to make company or organization to be more productive and effective, there are some tools and strategies from knowledge management in terms of how to improve knowledge creation, sharing and many more. According to Henao-Calad & Arango-Fonnegra (2007), they stated that knowledge management is an emerging discipline focused on the application of strategies, tools and technique to improve the creation, acquisition, accumulation, sharing, protection, distribution and exploitation of knowledge, intellectual capital and intangibles. Meanwhile, in another perspective, according Greiner, Bohmann & Krcmar (2007), knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. Thus, knowledge can also be defined as the skills that the employees or staff have in handling the knowledge. Knowledge can provide added value if it results in actions and decisions. knowledge is an organized combination of data, assimilated with a set of rules, procedures, and operations learnt through experience and practice (Bhatt, 2001).

3.0 METHODOLOGY

For this study, the combination of previous study or research has been done in order to gain information regarding the topic. The previous research usually has been searching in databases such as most of them are in Emerald, Science Direct, google scholar and related website regarding the topic. Besides, a literature review also has been made from books, scholarly articles as well as any sources relevant to a particular issue, area of research and theory. Literature review are designed to provide an overview of sources that has been explored while researching particular topic and to demonstrate to the readers on how the research fits within a larger field of study. There are several purposes of literature review which are describe the relationship of each work to the others, to avoid unnecessary duplication, to evaluate promising research methods as well as to relate findings to previous knowledge and suggest further research. Apart from that, all the information that has are available in literature review are related with the research that has been conduct as well as literature review are help to support the research. The data mining and knowledge management keywords are being use in order to find for suitable and related material for doing this study.

4.0 DISCUSSION

Since the advancement of internet and technology, so the use of application become more effective. According to Sang Jung Lee and Keng Siau (2001), the advancement as well as

the explosive growth of technology will help to develop an effective way in handling the data and databases. Through data mining, there are techniques in order to find for the valuable information in large volumes of data. In knowledge management organization, data mining will help in provide the effective searching of useful information. Besides the advantages of data mining, there are also challenges or disadvantages of applying data mining in knowledge management organization. Based on the literature review, there are five common issues of applying data mining in knowledge management organization which are technology, skills, inconsistent or missing data as well as privacy and data security.

4.1 Technology

In this context, technology refers to the capability of the organization to provide a better system or application that can give easier for the user to use it. For organization to have an effective knowledge management, technology is the common issue. According to Lawal, Odeniyi and Kayode (2015), due to the complacency of the people with the old system, the critical challenge of technology is the integration of information system applications with business processes. This is because the change of the system is inevitable. So, the organization must aware of the changes of technology such as the applications that reflect to the better knowledge management. In context of data mining, technology are the important elements in order to provide a better handling of data in the system.

It is important for the organization to have an up to date technology because from technology, organization can be more productive in terms of saving the space for storage. According to Bhatt (2001), they stated that technologies enable coordination between communities of practice by minimizing a number of human and physical constraints. For example, information technology enables the searching, storing, manipulating, and sharing of a huge amount of information per unit of time, by minimizing the limitations of time and space. So, if the system still using the old system or application, the usage of data mining in knowledge management are also will not be effective and could cause a lot of issues such as problems in searching and retrieving the data and many more.

Up to date technology also enable organization or individuals to avoid problems when using the data mining application. As we know, to use or install data mining application require a high-speed computer in order to avoid problems such as the application unable to run and many more. According to Sang Jung Lee and Keng Siau (2001), poor technology used in data mining leads to the poor handling the data. For example, as we know that in many database system, a lot of complex data such as hypertext, multimedia data as well as spatial data. If the data mining technique as well as the technology is powerful the data mining processes will be more effective as well as can avoid the problems regarding technology. So, it is clear that a lack of technology will cost challenges in applying data mining in organization.

4.2 Skills

By applying data mining in knowledge management towards organization, skills in handling or managing the data mining application is very important. This is because, by mishandling of the data mining will cause a lot of problem such as data missing and many more.

So, skills also can be considered as one of the challenges in applying data mining in knowledge management towards organization. According to Izabela A. Wowczko (2015), they employ data mining open source tools such as RapidMiner in order to easily accessible online vacancy data. They demonstrate various of techniques for using and managing the data mining. So, the skills or techniques need to be learn by the workers in organization in order to avoid problems such as ineffective ways of discovering knowledge through the vacancies of data.

To use data mining application is very complicated. Users need to attend training or courses in order to master in using the data mining application. Certain techniques and skills must learn by the users in order to use it. According to T. Ramayah, Noornina Dahlan and Ruzi Panjang Adni (2008), skills and experience are very important in order to make sure that the quality of the current and future workforce in managing the data mining are well preserved. Many workers in organization hard to understand the techniques in managing data mining because they need to acquire necessarily skills and knowledge of data mining in order to strategically and effectively manage the data mining technology in organization.

In order to prevent this problem, there are certain techniques need to be master before using the data mining application. According to Wei-ChaoLin, Shih-WenKe & Chih-FongTsai, there are seven data mining techniques such as association, classification, clustering, forecasting, regression, sequence discovery as well as visualization. Those are the techniques that lead to the effective in the use of data mining application.

4.3 Inconsistent Data or Missing Data

Inconsistent data or missing data in data mining process are commonly occur. Inconsistent data or missing data could give a big impact, specifically could give many negative impacts towards organizations. For example, the more the data is collected, the higher the probability of the data will be missing due to the explosion of the computer software and high capacity of storage media. According to Marvin L. Brown and John F. Kros (2003), data inconsistency may occur due to several reasons such as procedural factors refer to error in data entry, refusal response refers to refuse to response for the questions and inapplicable response refer to data missing within a data set.

Apart from that, data need to be arrange or organized and use it properly. According to T. Ramayah, Noornina Dahlan & Ruzi Panjang Adni (2008), the important parts in data mining activities is to identify the quality of the data because quality data must be organized into an accessible and extendible data warehouse. For example, quality of the data is very crucial because without quality data, data mining loses its central function of providing managers with meaningful patterns and trends. In the other words, the dynamic nature of business data affects the quality of information retrieved. So, it is clear that from the author has stated above, inconsistent data and missing data the key factor that can lead to the challenges of applying data mining in the organization.

4.4 Privacy and Data Security

Since data mining involve with technology, the common challenges or issues that usually faced by organization is privacy and data security. This is because by negotiate with the technology, there has their own advantages and disadvantages. According to Lawal, Odeniyi and Kayode (2015), privacy in terms of data protection of individuals are commonly occur such as analysing people's profiles without consent also one of the issue or challenges in privacy and data security.

Meanwhile, to use data mining application, the administrator need to make sure that only authorize person only can access or retrieve the data. This is because all the data that has in the organization are vital and need to be control securely. According to Jaseena and Julie M. David (2014), in terms of security of data, the issues are commonly occurred is security violations by unintended unauthorized access or inappropriate access by privileged users. Those are will contribute to the loss of data. So, in order to make sure the effectiveness of the use of data mining application, some method in protecting data need to be done such as use the authentication methods.

Back in the years, there are some cases regarding the privacy and data security. Although in the big company such as Ford Motor Credit Company as well as Sony, cases regarding security are also occur. A lot of cases involving hackers accessed and stole data of customers that relate with persona and financial information available, credit card stolen and identity theft become a big problem. Apart from that, according to Sang Jung Lee and Keng Siau (2001), data mining is a risk to privacy and data security due to the fact when information or data may be viewed from many different angles at different abstraction degrees, it threatens the intention of preserving statistics secured and guarding against the intrusion on privateness. For example, it is quite easy to compose a profile of an individual such as personality, interest, spending habits and many more with data from various sources. So, that is why we cannot simply give our information or data especially our privacy data because it is not guaranteed secured if we use the application in order to run for something such as for storing data. From the author opinion above, it is clear that privacy and data security can lead to the challenges in applying data mining in the organization.

5.0 CONCLUSION

As conclusion, we know that by applying data mining in knowledge management towards organization are very important. This is because through data mining, the process such as decision-making process become more fast and effective. Apart from that, the work of the staff in the organization also become more effective and efficient. According to Marijana Zekić-Sušac & Adela Has (2015), most the data mining supports the knowledge management especially in business transaction in terms of marketing. For example, by using data mining, it discovers the association rules which means the method to discover which products are frequently purchased by the customer. From the statement, it will give the idea for the company of the products to know which products are usually purchased by the customer and from that they can make some improvement on certain products. As being mention before, by using data mining in knowledge management also can give disadvantages or also has their own

risks. In the future, in order to minimize the problems that has been mention before, drastic and serious action regarding the challenges in applying data mining must be take place so that the use of data mining especially in organization become wider.

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