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The Implementation of Supply Chain Management and Big Data to Accelerate Stock Order in Mega Drug Store

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ABSTRACT

This study discusses the application of big data analysis in the reservation process on ordering the drug stocks at Mega drug store. Data collection was done by using big data analysis with survey method. The aim is to obtain the suppliers' information as well as the nearest and quickest access from Mega drug store so that it can speed up the process of ordering the drug stock. In addition to coordinating the drug stocks, the owners also want some progress in their business. Big data analysis can be defined as an application that implements data mining, statistical analysis, prediction analysis, and others. Analysis using big data provides the effect to improve business performance because it can improve the services to customers, sell new products, increase sales, and open a new branch. This research was conducted to explore the use of big data analysis in its influence on supply chain management. Among distributed 300 questionnaires, only 247 respondents responded, with a percentage of 82.33%. 35.4% of the respondents indicated that they were never involved in the acquisition, control, storage and stock management of health medicines commodities. When asked about the scope of the supply chain where they were often involved, 43.9% of respondents indicated that they felt involved with forecasting, 69.5% with procurement, 22% with inventory control, 4.9% with distribution, 45.1% with drug management information system and 34.1% with monitoring and evaluation.

1. Introduction

In managing drug stocks at Mega drug store, the store needs a system that can ensure the supply of the drug in guaranteed quality, on time drugs delivery and the right amount in accordance with the reservation. If there are obstacles in delivery process such as delays when delivering the drugs, the drugs will expire, or the quality of the products will decreased[1]. Errors on wrong orders can lower the drug stocks which is insufficient to distribute to customers or excessive stock in the warehouse can create quality loss of the drug[2]. In addition to coordinating the drug stocks, the owners of course, also want progress in their business.

2. Literature Review

Based on our literature review, we can only identify a few studies published on this subject. [3] defined big data as "data sets which size is beyond the ability of typical database software can capture, store, manage and analyze"[3]. Big data analysis and data mining technology can be used to create an in-depth analysis into the historical life cycle data, to determine the knowledge, and then optimize the work[4]–[6]. For a long time, supply chain management use statistics and operations to optimize the stocking and request proposals s[3]. Analysis of businesses using information systems support has a strong relationship with supply chain performance[7]. However, the development of big data is bringing new opportunities that can be used to define big data analysis on supply chain management [8][10][11]. The pharmacists in Nigeria study supply chain management to increase awareness of the drug supply in Nigeria so as to prevent the spread of disease[9][12].

3. Research Methodology

In order to maximize the order time to be quicker than usual, big data with questionnaire survey and division was used to get random data from the customers who had purchased the drugs in Mega drug store. The customers answered the questionnaire while waiting for their drug to be prepared. In processing big data, the data from the questionnaire and the report of the highest purchased drug transaction data can inform the drug that is rapidly ordered and it can be used to immediately order the drug which stock is low in order to regenerate the stock to continue to run and supply it sooner[13], [14]. The combination of supply chain management and big data allows us to make observations to see the most complete information about the drug supplier or the nearest and quickest access from Mega drug store [15]. When Mega wishes to book the stock quickly, it already has patterns that can assist in speeding up the stock order even though there are obstacles such as suppliers which are out of stock.

4. Results and Discussion

Of the 300 questionnaires distributed, only 247 respondents responded, with a percentage of 82.33%. 46.3% of them were male while 52.9% were women. 53.7% of the respondents were 21-30 years old and 36.6% were 31-40 years old. 8.5% of the respondents were 41-40 years of age and 1.2% of them were over 50. 29.3% of the respondents responded that they did not understand the terms of the supply chain management. The other 20.7% responded that they did not know the guidelines applicable for national drug distribution. Only 14.6% of the respondents knew or have a copy of these guidelines. When asked about their awareness of the new policy, 53.7% stated that they were not aware of this policy and only 22% of them were.

However, 35.4% of the respondents indicated that they were never involved in the acquisition, control, storage and stock management of health medicines commodities. When asked about the scope of the supply chain where they were often involved, 43.9% indicated that they felt involved with forecasting, 69.5% in procurement, 22% in inventory control, 4.9% in distribution, 45.1% in management information system drugs and 34.1% in monitoring and evaluation. Only 15.9% of the respondents indicated that the supply chain had managed to operate well in their environment where 53.8% of them were community pharmacists. 84.1% indicated that the pharmacists in Mega were not yet ready to handle all aspects related to the drugs supply chain because they did not have sufficient relevant experience, the degree of experience required to assist them in carrying out the ins and outs of the health commodities supply chain management. 69.5% of the respondents indicated that they were often lack of vital medical supplies and essential drugs in their place. These percentages show that they often run out of stock, of which 85.2% were hospital pharmacists. 5% of the respondents indicated that they often lack vital medical supplies and essential drugs in their place. From the data above, the researcher obtained some demographic charts as follows:

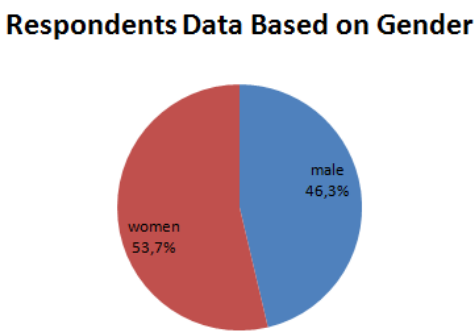

Figure 1. Respondents Data Based on Gender

This chart presents the sex ratio of respondents who filled out the questionnaire that had been distributed.

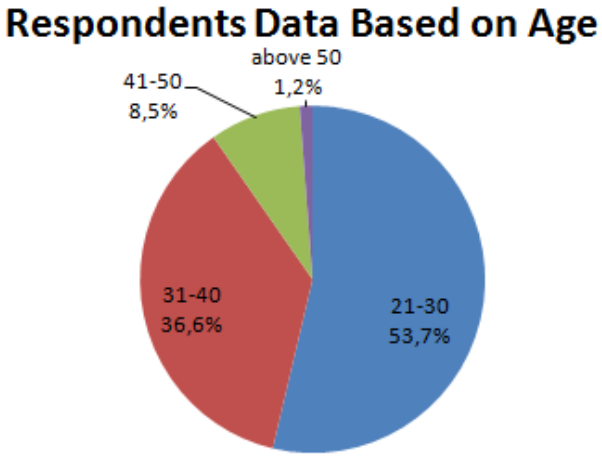

Figure 2. Respondents Data Based on Age

This diagram presents the age data of the respondents. The diagram above shows the number of respondents who came to the Mega drug store. The number of the respondents who were 21-30 years old were more than the respondents who were over 51 years old. This could be because younger people come to buy medicine for their sick parents.

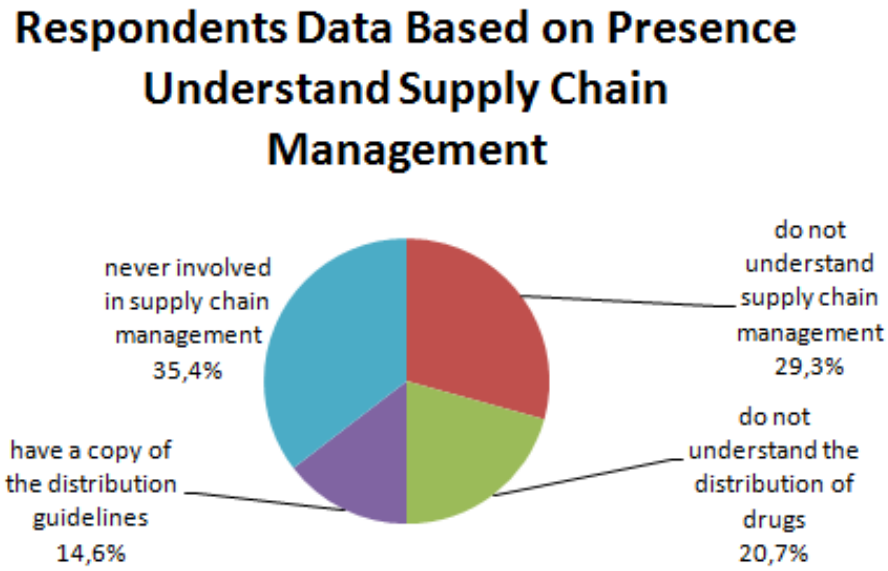

Figure 3. Respondents Data Based on Presence Understand Supply Chain Management

This diagram presents the data from the respondents' understanding of what supply chain management is. From the data above there were still a lot respondents who were not involved and did not understand the supply chain management.

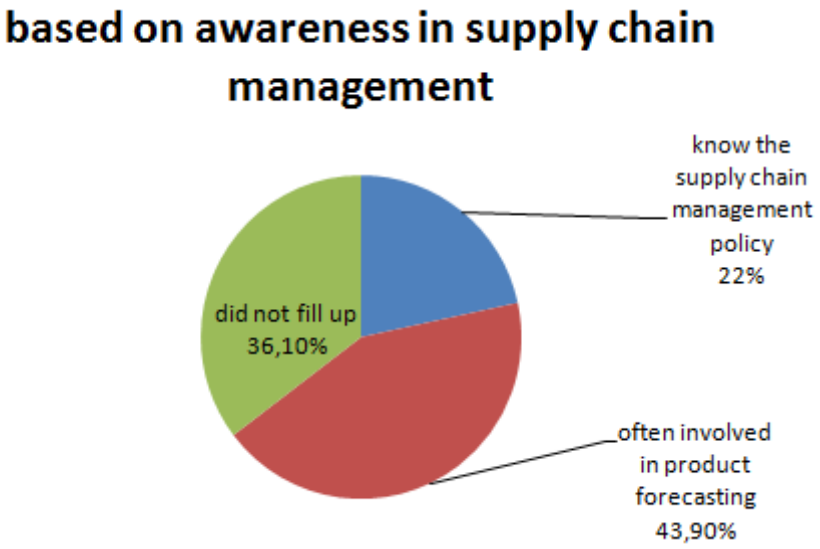

Figure 4. Respondents Data Based on Awareness of Supply Chain Management

This diagram represents the data based on awareness of the existing supply chain management surrounding their environment. Most of the respondents only knew their supply only by predicting and guessing without clearly knowing the procedure of stock reservations using supply chain management. Only some respondents knew the steps and procedures of supply chain management.

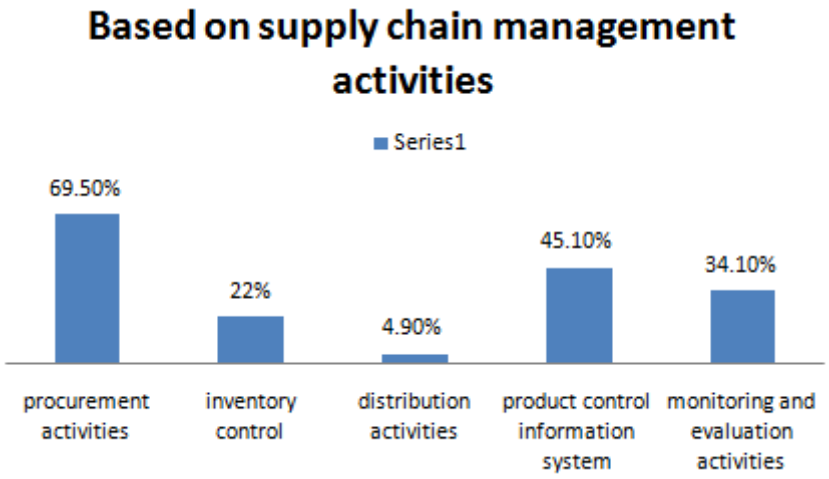

Figure 5. Respondents Data Based on Supply Chain Event Management

This graph presents the data of the respondents who had conducted activities within supply chain management. From the result, many conducted the procurement and used the control products information systems. Monitoring and evaluation of products has been associated with inventory control, although the percentage is lower.

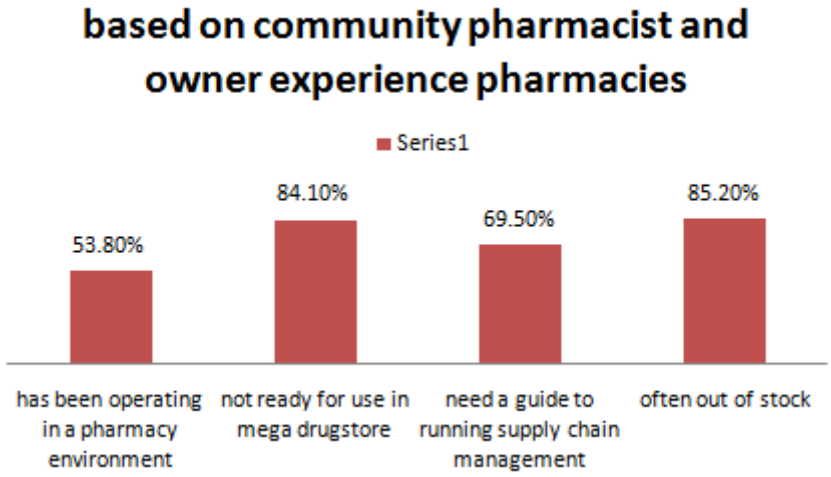

Figure 6. Respondents Data Based on Community Pharmacist and Pharmacies Owner Experience

This graph presents the data from the respondents based on the drugstore's owner/pharmacy experience and the pharmacist community about the use of supply chain management in Mega drug store. According to these respondents, Mega drug store often runs out of stock. According to the other respondents, supply chain management is still not suitable for its application. However, there were also some respondents who commented that the implementation of supply chain management had been well operated in Mega drug store even though the percentage was low.

5. Conclusion

By using big data and supply chain management concept, Mega drug store can get a new pattern in making a reservation of the drug when the drug stock is low. By calculating the number of the largest drug purchase, the drug which is often sold as well as the availability of drug stocks can be used to make a quick decision in ordering the drug stock based on the information from the big data. When ordering the drugs, it is possible to choose the fastest supplier in the estimated delivery time, distance, cost, and others that can affect the speed in ordering the drug stock.

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