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Factors Influencing the Effectiveness of Inventory Management in Manufacturing SMEs

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Abstract. Effectiveness of inventory management is a vital part in the manufacturing organization to be more competitive. The previous studies have indicated that there are several factors influencing the effectiveness of inventory management in the organization but there is lack of researchers who carried out the research in the manufacturing small medium enterprise in Johor. Therefore, the purpose of this research is to identify the problem of inventory management faced by the manufacturing small medium enterprise and also to determine the factors that will influence the effectiveness of inventory management. In completing this research, 80 employees were selected randomly from the manufacturing small medium enterprise in Batu Pahat, Johor and they were requested to complete questionnaires. The result have shown that the problems of inventory management faced by manufacturing organization were underproduction, overproduction, stock out situation, delays in the delivery of raw materials and discrepancy of records. The factors, documentation/store records, planning, knowledge of employees/staff skill have shown to significantly influence the effectiveness of inventory management while the funds have shown slightly significant influence on the inventory management in manufacturing small medium enterprises. This quantitative study is important to the manufacturing organization in Malaysia because it provides the guidelines to the employers of manufacturing small medium enterprises in Batu Pahat, Johor.

1. Introduction

The most common problem faced by the manufacturing SMEs in Malaysia is poor inventory management that would affect the performance of organization [1]. Ngubane et al. [2] also stated that it was found that lack of inventory management skills have prohibited the manufacturing SMEs to be powerful competitors in the manufacturing industries. This problem occurs due to several factors. One of them is poor documentation or store records. As Boyer [3] has claimed, the processing time of manual documentation and posting records are long and there are high chances to misplace the figures or to wrongly record the information. As a result, the accurateness of the inventory record will be affected and cause discrepancy of the records. According to Raman, DeHoratius, & Ton [4], inaccurate inventory record has reduced ten percent of an organization’s profits. The common causes that lead to inaccuracy of company inventory records are the shrinkage of inventory, errors in inventory transaction and keeping the inventory in the wrong place. The shrinkage of physical inventory means the physical inventory has been stolen, damaged, expired and spoilt, and the
researchers have proven that the rate of physical inventory shrinkage is 0.6 percent for the employers of manufacturing organizations. Thus, this study intends to identify the problems of inventory management and to determine which factors influence the effectiveness of inventory management of manufacturing SMEs located in Batu Pahat, Johor.

In the most recent era, the inventory management practices implemented by the organizations have transformed drastically [5]. Aro-Gordon and Gupte [6] have defined inventory management as “a blueprint of the inventory management system and includes the physical infrastructure, the planning and control structure, the management information architecture as well as the organisational embedding of the inventory system” (p.345). Based on the scenario stated by Esther [7], the poor practices of inventory management will cause not enough raw materials for production line and distribution cycle productivity is disrupted. Thus, the organization will be in the disadvantageous position to compete in the manufacturing SMEs. Poor inventory management can create a serious impact on the capacity of productivity in an organization. From the perspective of Esther [7], assets, equity, office equipment, work-in-progress inventory and general operation equipment are also claimed as the inventories that the organization needs to maintain well other than raw materials and finished products.

2. Literature Review

Inventory management is an important part in making all the decisions in handling the inventory in an organization such as activities to be carried out, policies of inventory management, and procedures in handling the inventory in order to ensure enough quantity of each item is kept in the warehouse at all times. Besides, the organization puts a lot of effort in controlling the inventory expenses through inventory management [8]. Esther [7] claimed that effective inventory management system will reduce the level of difficulties of operations which can lead to the success of an organization such as executing, administrating and scheduling of distribution and shipping network. Thus, improving the inventory management of an organization will greatly enhance the quality of the outcome of business performance. In other words, the goal of inventory management is to make sure of the availability of the resources in an organization.

According to Esther [7] and Othman [9], the previous researchers have pointed out the usual problems of inventory management faced by the organization are underproduction, overproduction, stock out situation, delay in delivery of raw materials and discrepancy of inventory. Waters [10] defined the underproduction as when the production rate is lower than the market demand and each unit of the fully manufactured products that arrives at the warehouse is transferred to the customers immediately and such, there is low or no safety stocks in the warehouse. Underproduction may cause the stock out situation if the safety stocks are unable to meet the market demands. Therefore, the customer satisfaction may be affected and this leads to loss of sales. Muller [11] has defined overproduction as when the organization has manufactured the inventory more than the requirement or needed quantity and as a result, wastes money, storage space, efforts, and resources and so on. Waters [10] also claimed that overproduction is when the production rate is greater than market demand and the bulk of inventory is kept in the warehouse. When the inventories are kept in the warehouse this implies there are a big sum of cash tied down with the inventory. In simple words, excessive inventory in the warehouse will constrain the resources of an organization. The Toyota Company also pointed out that overproduction is one of the wastes that occur frequently in the organization. Waters [10] added that overproduction will give the high level of finished goods accumulated in the storage while ineffective procurement gives to a high level of raw materials kept in the warehouse, resulting in pervasive waste within the organization.

Stock out situation is the most common problem faced by the majority of organizations as expressed by Mazanai [12] and it greatly impacts to the level of customer’s expectation and leads to the low performance of the organization. As Waters [10] stated, some of the customers will not be willing to wait for the back-orders to arrive when there is shortage of stocks, resulting in the loss of sales of organization. According to Kamau and Kagiri [13], keeping the right quantity of inventory in
an organization is the most challenging problem, but the organizations have tried to avoid accumulated inventory because unnecessary purchased or manufactured inventory may raise the overall facility cost. Esther [7] also clarified that the stock out situation will cause production delays, idle workers, idle equipment and unexpected supply order in the warehouse or retail production and this results in the loss of sales and customer dissatisfaction. On the other hand, Waters [10] has clarified the causes of delay in the delivery of raw materials. The time needed for a provider to receive and process the order, and arrange the delivery sometimes is too long. The organization may receive the materials within a few hours from local providers and a few days from the foreign providers. Sometimes, a few months is required to receive imported raw materials with a complicated distribution method. Thus, the postponement in the delivery of raw materials will disrupt the production operation.

Muller [11] indicated that discrepancy is the greatest problem with annual inventory records. Stocktaking is used to determine the actual quantity of inventory kept in the storage and the record of inventory [10]. According to Waters [10], the discrepancy of important inventory should not be more than 0.2% while other inventory discrepancies is not allowed to be more than 1% in inventory levels. According to Kamau and Kagiri [13] it has also been proven that the discrepancy of inventory will give impact to the competitiveness, and also the profitability of the organization. Waters [10] indicated the common scenario is inventory records differ with the actual quantity on hand and this leads to insufficient raw materials for production line.

The previous researchers have stated that the factors that will influence the effectiveness of inventory management are inventory control planning, documentation/store records, knowledge and skills of employees, and funding. Therefore, these four factors were selected in order to achieve the objective of this research. The effectiveness of inventory management is to augment operations of the organization to make sure the flow of resources, services and products are running smoothly [14]. One of the critical elements in maintaining effective inventory management is planning. Planning is stated by Jonsson & Mattsson [15] as the method which is used to control and manage the inventory such as forecast the market demand, make the plan for maintaining the safety quantity of materials, setting reorder point and manage the stock level in an organization. Without the coordination of sellers in inventory planning, the probability of failure in predicting the inventory requirement in the future market demands will rise [16].

Inventory record inaccuracy is one of the unsolved problems faced by the manufacturing organization and brings a powerful side effect on the performance of an organization, for example, rescheduling the operation of operation schedule, generating the loss of sales, delay penalty, suboptimal planning and extra expenses for using the transport vehicles [17]. As stated by Othman [9], most of the organizations recruit unqualified employees to deal with their inventory. Normally, these employees lack of familiarity, have insufficient training or lack of attention in their job. These situations will result in the disruption of the operation process of an organization, such as spending a lot of time on tracking down the stock which has been put in a wrong place or has an incorrect inventory record. Therefore, qualified employees and proper management of inventory are necessary in the performance of the manufacturing organization. Moreover, as Carter and Price [18] stated, the organization’s activities will be disrupted if there are not enough funds. Dobler, Burt and Lee [19] also mentioned that funds are the constraining element to the effectiveness of inventory management if the funds cannot be assigned properly to all organization’s activities.

3. Methodology

The quantitative research method was selected to collect the numerical data in this research. As stated by Welman, Kruger, & Mitchell [20], quantitative method is one of the descriptive survey designs which involve collecting data in order to answer the questions raised in the research. In this study, the quantitative research method was appropriate to be utilized to identify the problems of inventory management and to determine the factors that will influence the effectiveness of inventory management in the manufacturing SMEs. Random sampling was used for this research. The sample size for this research was determined by referring to Krejcie & Morgan’s [21] table. The target
A total of 80 respondents were selected randomly from the population. On the other hand, the questionnaire was made up by three sections. Section A of the questionnaire asked about the demography of the respondents. Section B identified the problem of inventory management faced by the organization. The frequency of problems of inventory management was measured by using a 5-point Likert scale which ranks from never to often. Section C was designed to identify the factors that influence the effectiveness of inventory management. Section C of the questionnaire asked about the problem of inventory management and adapted from the research done by Munyao et al. [22]. It was modified from the research which was created by Nzuza [23]. The collected data will be measured by the 5-point Likert scale which ranks from 5= strongly agree to 1= strongly disagree. The Cronbach’s Alpha for the questionnaire obtained in the pre-test with 30 employees in the manufacturing SMEs was 0.776, which was deemed as good, as declared by Sekaran [24]. The research questionnaire has been distributed to 80 respondents from manufacturing SMEs in Batu Pahat, Johor, but there were only 74 responses that have been collected successfully. The achieved response rate for this research was 92.50%. The quantitative data obtained from the questionnaires were analyzed using the Statistical Package of Social Science (SPSS) analysis software.

4. Findings and Discussions
4.1 Descriptive Analysis: Problems of Inventory Management in the Manufacturing SMEs
The first objective is to identify the problems of inventory management faced by the manufacturing SMEs in Batu Pahat, Johor. The results have indicated the problems of inventory management that are commonly faced in the manufacturing organization, which are underproduction, overproduction, stock out situation, delays in the delivery of materials and discrepancy of inventory records. The research result illustrates that the majority of respondents from manufacturing SMEs have faced these problems except for overproduction, which is similar with the result of Munyao et al [22]. Table 1 displays the problems of inventory management which have been ranked based on the mean score. The highest mean score (3.08) is the discrepancy of inventory records, which means the problem of discrepancy of inventory is the most common problem faced by the respondents. As Water [10] stated, the discrepancy of inventory records scenario always happens and the actual quantity of materials do not equivalent with the records and this causes the loss of worker productivity. According to previous researcher, the discrepancy of inventory is due to error in manual documentation, misplacement and misappropriation of inventory in their organization [25; 26]. The second common problem with mean score (2.68) is delays in delivery of raw materials from suppliers. The lowest mean score (1.99) is overproduction which means this type of problem is not that common towards the respondents. Thus, some of the organizations produce the products after receiving the sales order rather than keeping the finished goods in the warehouse.

![Problems of Inventory Management](image_url)

**Figure 1: Problems of inventory management**
4.2 Factors That Influencing the Effectiveness of Inventory Management in SMEs Manufacturing

The second objective of the research is to determine the factors that influence the inventory management in manufacturing SMEs in Batu Pahat, Johor. In order to achieve the second research objective, 22 items have been tested to determine the factors that would influence the effectiveness of inventory management, which are planning, documentation/store records, knowledge of employee/staff skill and funding as shown in Figure 2. With regard to planning, the planning items such as low participation of inventory suppliers in the inventory plan, establishment of maximum and minimum inventory levels as well as determination of re-order level of stock are the most significant items that will influence the effectiveness of inventory management. According to Esther [7], some of the manufacturing organizations do not obey firmly the inventory policy in their organization. Thus, the organizations fail and some of them do not maintain minimum and maximum stock because they face financial problem and the storage cost for the product is high. In the research of Munyao et al [22], about half of the respondents were not efficient in making sure of the availability of inventory in their warehouse. Moreover, inventory planning and its forecasting imprecisely leading to the ineffectiveness of inventory management were also supported by a previous researcher, Takim [27].

![Average Mean Score for the Factors that Influencing the Effectiveness of Inventory Management in SMEs Manufacturing](image)

Figure 2: Average mean score for the factors that influencing the effectiveness of inventory management in SMEs manufacturing

Documentation/store records is one of the factors that affect the inventory management and the result was in accordance with the research done by a previous researcher, James Ng’ang’a [28]. The results have shown that the way of handling or monitoring the inventory and document would influence the effectiveness of inventory management. The indicator of the items of documentation/store records such as the computerized system influencing the effectiveness of inventory management has been affirmed by the respondents of this research. According to Jessop & Morrison [25], manual documentation and manual posting inventory record would need longer processing time to complete the task and there are high possibilities of information error. When the information error occurs, the poor inventory records and misappropriation of inventory would lead to discrepancy of inventory records.

Based on the research result, the factors - knowledge and skill of employee is considered as leading factor that would influence the effectiveness of inventory management in manufacturing SMEs, because the total average mean score is the highest among the four factors. The previous researcher, Nzuza [23] has acknowledged that poor staff training and poor communication among the employees would influence the effectiveness of inventory management. As stated by Esther [7] and also
Ferenčíková [8], the lack of free flow of information or communication among the employees would bring a great negative impact towards the organization especially communication between the sales representatives, production department and purchasing department. The information must be transparent to all the relevant employees to make sure the employees are always up to date. In addition, some of the organizations do not provide formal training to new employees and some recruit employees who have no relevant experience in managing the inventory. Therefore, the effectiveness of inventory management would be affected. Furthermore, the factor – funding is considered as a factor that would influence the effectiveness of inventory management even though the result is not as notable as other three factors. The previous researcher, Munyao et al [22] have pointed out that there are many SMEs that do not pay attention and are ineffective in updating their inventory budget and also in their preparation of the inventory budget in the organization. Thus, the organizations fail to carry out their usual activities due to insufficient funds. As Esther [7] stated, the small medium enterprises always face the inflation pressure because the small medium enterprise do not have much working capital when compared to large organizations. Therefore, fluctuation of raw material prices would destabilize their inventory and purchasing plan, forcing them to invest more money in the inventory. Thus, some of the organizations do not maintain the minimum and maximum inventory in their organization due to high holding cost and making it difficult to convert the inventory into cash. Hence, manufacturing SMEs have to improve their manufacturing operations including inventory [29] and boost their performance in order to face the increasing competition in the marketplace [30].

5. Conclusion
In conclusion, all the predetermined objectives of the research have been achieved. The findings of the research have identified the most common problem of inventory management faced by the manufacturing organization are underproduction, overproduction, stock out situation, delays in the delivery of raw materials and discrepancy of inventory. Besides, the factors that influence the effectiveness of inventory management are planning, documentation/store records, knowledge of employee/staff skill and funding. Therefore, the findings of the research have demonstrated the guideline for the manufacturing SMEs about the factors that influence the effectiveness of inventory management and this guideline acts as a guide for the employers to overcome the problem.

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