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IT-Based Cost and Inventory System for Small Industries

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Abstract: IT-based has emerged as one of the most in-demand method as the internet becomes an integral part of people's daily life. Small industries are looking for the simplest method of managing and monitoring product cost and inventory remotely, outside of a physical office and store. By proposing Mini IT-based cot and inventory system for small industry, the study aims to develop a system which has an ability to estimate product costs and assess the effects of significant material price increase on overall product costs. The proposed system also includes an inventory management process which is intended to help small industries manage their inventory efficiently, keep track of product stock, and respond wisely to changes in material availability. Users can input changes to material prices, and the system will automatically update the costs of the final product. This enables industries to assess the financial impact and make necessary modifications to pricing or sourcing strategies. The small IT-based cost and inventory system supports accurate and effective inventory management and cost analysis. It eliminates manual calculations, lowers the possibility of mistakes, and offers real-time access to product costs and product inventory.

Keywords: Costing, Inventory, Internet Based, Sensitivity, Analysis

1. Introduction

Information technology (IT) is the creation, processing, storage, secure transmission, and exchange of all forms of electronic data. IT includes the use of computers, networking, storage, and other physical devices. As opposed to technology utilized for personal or leisure purposes, IT is typically used in the context of corporate activities. Telecommunications and computer technology are both included in the business usage of IT [1].

IT is developing widely in industries where the number of businesses is always growing to meet consumer demand in certain specified locations. Growing demands normally is associated with growing inventory of product [2]. Depending on their convenience, many types of inventory management methods are offered, from hypermarket to mini market. Most industries are in neighborhoods, on streets, or in retail centers. In essence, every business offers a vast range of products and services, from the

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wholesaler or supplier to the final consumer [4]. To satisfy client demand, excellent inventory management was therefore essential to running a successful firm [5].

Many big industries use a variety of inventory management strategies to ensure that having enough goods or materials to meet demand without overstocking or having too much inventory [2]. Costly and sophisticated software usually used to help in managing the overall inventory. However, majority of small business cannot afford to buy and use the sophisticated software. Persistently, have to stay with the issues related to inconsistent tracking, warehouse efficiency, inaccurate data, and shifting demand together with all potential drawbacks of not having a good inventory management system [6]. Thus, this project is specifically dedicated to help the small businesses to manage their inventory using a simple yet applicable method. Mini IT-Based Cost and Inventory System makes it possible for small businesses to properly managing inventory in accordance with industry 4.0 by employing IT-based methods for ensuring the smooth flow of inventory and managing product costing to raise awareness of current material prices.

1.1 Problem statement

One of the crucial divisions that needs to be well managed to guarantee the smooth operation of everyday business operations is inventory [7]. However, because lack of computerized systems to run businesses, several industries still do not understand the significance of inventory management [8]. As a result, there is virtually little security for any data, documents, or anything linked to everyday business or inventories. For each good and each supplier, numerous records have been kept, taking up time and becoming useless for future references. Additionally, because of inadequate inventory management, industries have difficulty determining the daily sales volume for each item and the item's amount of accessible inventory [2].

1.2 Objective

i. To develop internet-based system with the capability to calculate product cost and monitor the inventory for small industries.
ii. To analyze the sensitivity of major material price increase to the overall product cost.

1. 3 Scope

i. The system is specifically for small industry that needed inventory system.
ii. The inventory will cover raw material and finished goods.
iii. The costing elements only labor, electricity, and packaging.
iv. The costing does not include advertisement, manager salary and director allowance.
v. The IT-based approach will be made using free web system.

1. 4 Significant of Study

There are numerous techniques for stock administration utilized by businesses with the reason to guarantee an adequate number of products or material to satisfy need without making overload or abundance stock. Inconsistent tracking, warehouse efficiency, inaccurate data, and shifting demand are all potential drawbacks of some methods. Mini IT-Based Cost and Inventory System permit small industries to have legitimate stock administration moving in accordance with industry 4.0 by utilizing IT-based expected to getting smooth progression of stock and overseeing item costing concerning expanding current material cost awareness.

2. Methodology

Methodology refers to a strategy for systematically resolving problems. Additionally, because studying is done in a systematic manner, it is easy to understand and learn [3]. The procedures and strategies used to plan, gather, and analyze data to provide data that can support the research are

included in this research approach. This methodology explains how to study the issue as well as the rationale behind the strategies and procedures employed. By outlining the research procedure performed, this methodology aims to assist the study method better.

2.1 Identifying data

The procedure entails identifying the crucial data points that must be gathered, saved, and tracked within the system. To ensure precise tracking and traceability, this entails classifying the various inventory items, such as goods, supplies, or equipment, and giving each one a special identity. Additionally, identifying data may include specifics about the controlled inventory, such as item descriptions, quantities, unit costs, and any other pertinent qualities. An inventory system can improve overall inventory management efficiency by streamlining operations, enabling better stock control, facilitating procurement processes, and providing vital insights for decision-making.

2.2 Data collection

To complete and maintain the inventory database, data collecting is a crucial step in the creation of an inventory system. Typically, the process involves gathering multiple sorts of data from numerous sources. Recording information regarding inventory items, such as product names, descriptions, categories, and unit costs, is part of this process. Data collection may also involve gathering supplier details like contact information, contract terms, and delivery schedules. An inventory system can offer a strong foundation for efficient inventory management, including inventory tracking, forecasting, and analysis for informed decision-making, by assuring thorough and accurate data collection.

2.3 Mathematical computational development

Utilizing Microsoft Excel's robust characteristics, mathematical computational development for inventory system development entails doing calculations, analyzing data, and producing insightful findings for effective inventory management. Data connected to inventory, including as quantities, prices, and financial indicators, can be applied to a variety of mathematical and computational tools provided by Excel. For instance, you can aggregate data, compute averages, and determine the minimum and maximum values of inventory quantities or prices using formulas and functions like SUM, AVERAGE, MIN, and MAX.

3. Results and Discussion

As the sensitivity analysis developed using appropriate mathematical computation, the product costing and database played a huge role. The information of all raw material cost was sum up together with the utility cost. The cost of utilities required for a product are also obtained from the database and listed to determine the total cost of a product. Each table of information in the system are linked to each other. The value of total cost will change when the value of raw material price is updated. Since the proposed system was created to be available over the web and allows for use without specific factory office location restrictions, the owner can amend or change the information if there is any change on the pricing of raw materials or the toppings of a pizza from anywhere and at any time.

3.1 Results

The data reveals the ingredient that is used the most may have an impact on the cost of the final product once the sensitivity to raw materials and toppings was effectively developed. Another sensitivity study was conducted for each product variety to increase its accuracy. The top three highest cost item were taken into consideration when analyzing the sensitivity of each product.

Sensitivity analysis each pizza flavor: most use item in each flavor

Chicken pizza Increment	Raw cheese price	Total pizza cost	Labor	Total pizza cost	Raw chicken price	Total pizza cost
-20%	RM 326.40	RM 4.40	RM 2,480.00	RM 4.53	RM 19.20	RM 4.60
-10%	RM 367.20	RM 4.53	RM 2,790.00	RM 4.60	RM 21.60	RM 4.63
0%	**RM 408.00**	**RM 4.67**	**RM 3,100.00**	**RM 4.67**	**RM 24.00**	**RM 4.67**
10%	RM 448.80	RM 4.81	RM 3,410.00	RM 4.74	RM 26.40	RM 4.71
20%	RM 489.60	RM 4.94	RM 3,720.00	RM 4.81	RM 28.80	RM 4.74
30%	RM 530.40	RM 5.08	RM 4,030.00	RM 4.88	RM 31.20	RM 4.78

Figure 1: Raw material sensitivity analysis of a product

Figure 1 shows the sensitivity analysis for the top highest item cost to produce chicken pizza which is cheese, labor, and chicken. These data, which were only a dummy data, show that the items cost more than others. Then, using an appropriate mathematical calculation method, their cost changes was calculated in accordance with the increment. Same method then is repeated to the other flavor to monitor the sensitivity.

3.3 Discussion

Figure 2 show the inventory system of the main product produced by the industry. There are five main products provided by the industry including Chicken, Beef, Cheezy, Seafood and Garlic pizza shown in the first table. The table also shows the dummy data as current inventory available in the store. At row 3 column B table, command *=NOW()* was used to defined the date of the data being updated.

	Chicken	Beef	Cheezy	Seafood	Garlic
6-Jul-23 CURRENT INVENTORY	39	16	27	23	12

Note: All data is in pieces of pizza.

	Chicken		Beef		Cheezy		Seafood		Garlic	
Date	In	Out	In	Out	In	Out	In	Out	In	Out
1/06/2023	14		14		11					
2/06/2023	16		20		12		14		12	
3/06/2023		12		12		12		11		11
4/06/2023					24		25		26	
5/06/2023	15	14		6						15
6/06/2023	20					8		5		
7/06/2023										
8/06/2023										

Figure 2: Inventory system of a main product

The second table in the figure represent in and out number of each product. The table somehow connected to the first table because the information in it depends on the all the information updated in the second table. The column 'In' represent the stock comes into the inventory and the column 'Out' represent the item comes out of the inventory. So, the current inventory table will always show the current value of the stock inside the inventory because automatic calculation command which is *=SUM(column in) – SUM(column out)* was used.

4. Conclusion

Mini IT-Based Cost and Inventory system are designed to help small industries owners and employees work less by computerizing all inventory-related tasks that can be completed at any time and from any location by anyone of any age. There might not be any more paperwork or inventory files

in physical form because it can be easily monitored or updated by a simple tap. This shows that the first objective to develop internet-based system with the capability to calculate product cost and monitor the inventory for small industries is achieved. The second part of this study managed to provide the sensitivity analysis of major material price increase to overall product price. This covers the second objective of the overall study.

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