Study of Real Time Database Management System (RTDBMS) on Inventory system

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Abstract – **The need of the database management system is increasing on organization especially product based company, tracking the in and out of the product to preventing unbilled product. The RFID technology been applied to make more secure and more reliable.**

I. Introduction

Nowadays, the need of the world is now more in securing the information and also the reliability of the system. The database management system also must be real time, checking the most valuable asset of the organization such as inventory, equipment and also the staff. By ensuring the asset, big money has been invested due of the quick technology on every day, also increment of world population, and the staff also growing bigger. So the real time database management system needed to apply in every single organization to stand as same level as other organization.

There have been many application of the real time database management system such as for logistic system [1] and also for power system of SCADA system [2]. By this system, we can control all the organization system for improvement of the human resources and also non human resources.

II. Literature Review

A. *Inventory Control System*

The system that tracking the entire inventory to control the stock so there will not out of stock. This inventory control system are same as the warehouse operation system. This system is to prevent any stolen inventory or misplace the inventory without any permission. Each of the inventory been placed an RFID tag to track every movement of the inventory.

B. *Radio Frequency Identification (RFID)*

The Radio Frequency Identification (RFID) is one of the wireless data communication that provide more secured data transfer but also saving more complicated wiring. The system also reducing many of space because of the RFID tag can be small as a 5cm^2 and thin as 1mm. the system just only need a RFID tag, RFID reader, and the personal computer. The RFID reader is needed to read the detail of the tag and store the data on the computer. The computer will check the status of the inventory at the database management system and store the new status of the inventory. Figure 1 show the sample of the standard RFID tag that patched on the box of the product.

Fig.1. A sample of RFID tag

The RFID also come on two types of system, which is active tag and also passive tag. The Table 4 show the difference of two types of RFID tag.

Table 1 Difference of the tag

Criteria	Active Tag	Passive Tag
Battery	Yes	No
Lifetime	<5years	<20 years
Size	Big	Small
Distance	Long Range	Small Range

C. *Database Management System*

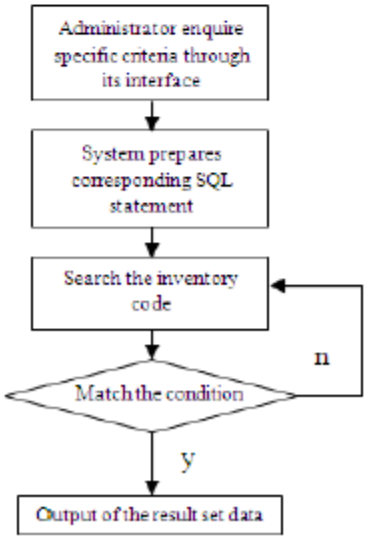

Fig.2. A generic operation flow for information retrieval through a DBMS

The database management system also needs some software to make it capable to do its job. The most software that used for the database is MySQL [3]. However for the capacity of the database which is for huge organization, we need the software for the Microsoft Corporation which is Microsoft SQL Server [4]. Its can access and enquiry more database and able to work more efficiently rather than MySQL. The figure 2 shows the flow chart of the operation on the system.

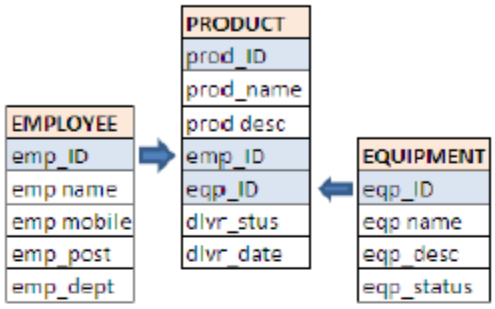

Fig.3. The database management system query

Figure 3 above show the listing of each database on the system. When any product been taken by any of staff, the data will be store on the database management system, the administrator will be alerted on the status and all the detail on the product taken will be viewed. Any suspicious action will be alerted and the security guard will take the responsibility.

D. Query Optimization

Query optimization is the process of minimizing the time used in executing a given query expression [5,6]. Its components help to determine how queries are performed. With the uses of the technique, time for information searching will be reduced as redundant decision rules will be eliminated and restructured [7]. Figure 4 demonstrates an example with a tree expression when the user is going to retrieve the equipment information when that item of equipment is controlled by a specific member of staff.

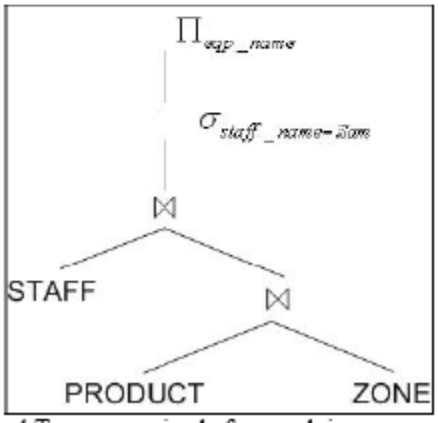

Fig. 4.Tree expression before applying query optimization component

When comparing this to the revised query statement as shown in Figure 5, it can be seen that the height of the tree has been decreased by one level, implying that the corresponding processing time will also be shortened in a level of time unit and the search area within the database will be decreased [8]. By doing this, the performance of data retrieval from the centralized database is enhanced.

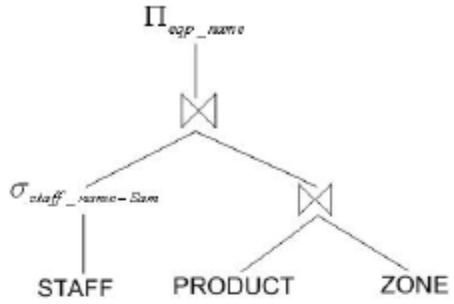

Fig. 5. A revised tree expression using query optimization technique

Warehouse operations are becoming more and more important in a supply chain network. The use of RFID has provided a number of advantages in the performance of daily logistics operations. However, a wide range of data is related to the warehouse, which is difficult to handle using pen and paper format. An effective database management system is essential to warehouses for managing all the information related to the company.

III. DATABASE MANAGEMENT SYSTEM

In order of making the database, we must list all the criteria to make easier for listing on the future. Figure 6 show the listed criteria before been attach to the MySQL software.

STAFF(REP NUM, NAME, ADDRESS, TEL_NO, POSITION, DEPT, E_MAIL)
INVENTORY(INV_NO, STATUS, INV_POSITION)
WORKORDER(WO_NO, STATUS_WO, STAFF_NUM)

Fig. 6 Data listed for database software.

After getting the list, the software will turn the data to the table. Figure 7 show the table of the database.

STAFF

STAFF NUM	NAME	ADDRESS	TEL_NO	POSITION	DEPT	E_MAIL
71	ALI	LOT 40,PPKKP	048985312	TA	TECH	ali@tech.com
74	KAMAL	LOT 41,PPKKP	048985321	PA	ADMIN	kamal@admin.com

INVENTORY

INV_NO	STATUS	INV_POSITION
8498613	NEW	ROOM A1
8971239	REPAIRED	ROOM A2

WORKORDER

WO_NO	INV_NO	STATUS_WO	STAFF_NUM
21312A	8498613	TRANSFER	74
87686T	8971239	REPAIR	71

Every minute, the system will track all the RFID tag at the inventory, so the database will update the present position of the inventory.All the data will be up-to-date to all front-end users, so the administrator will view all the inventory status. In order to let the staff to searching the inventory of the work order, the staff can easily find on the system. The location detail can make any staff work efficiently.

IV. Conclusion

The conclusion on this paper is the system can be more efficient when we can apply it through the internet and also in real time on our hand phone. The Java software maybe needed to install to the hand phone to make it functionally.

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