

CPSC 471: Project Proposal

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Introduction

Definitions: Inventory mismanagement will refer to the inability of a store to accurately track and maintain stock levels of product. This will lead to overstocking, shortages, or the delayed fulfillment of orders

Problem Summary: The frequent delays and inefficiency in tracking inventory and orders in a computer component store can cause severe operation issues and increased customer dissatisfaction for unfilled or delayed orders.

Solution Summary: A web based database that functions as a way to clearly and concisely monitor inventory, track supplier delivery, customer orders and order payment/fulfillment to address any underlying inefficiencies.

Motivation: Efficient inventory management is crucial for timely delivery and customer satisfaction in a computer component store. This keeps the store operational and customers happy.

Problem Definition

History of the Problem: Inventory mismanagement has always been a point of issue in not only the computer component sector but in retail and wholesale as a whole, with businesses mainly struggling to balance supply and demand. This problem can be exacerbated in the computer component sector as new hardware is constantly being updated and released to consumers on a frequent basis, which results in a surge of demand. Therefore it is integral for a business to keep precise track of their inventory.

Why is the problem interesting: Effective inventory management directly impacts profits and customer satisfaction through the effective balance of supply and demand. Solving this problem will make it easier to view any existing problems and improve the supply chain efficiency of a store.

When and why the problem occurs: Problems can occur with supplier delays, incorrect inventory stock, failure to accurately supply customer order, all of which are problems that arise from either manual paper-pen inventory management or a poorly designed digital database system.

Current Solutions: Some small businesses may use simple spreadsheets, but these lack usability as they may be difficult to interpret and use for employees as they lack a GUI for easy data integration and inventory updates. In addition, physical copies cause storage problems as they take up a lot of space, and can take a lot of time to find the spreadsheets when stored. An alternative may be an existing inventory management software such as one provided by Oracle, but this could be outside of the budget of small businesses as the entry level software starts at ~\$3000 a month [1] and can be even more expensive than that.

Similar Systems: Once again a similar system is the ERP system provided by Oracle but these are very expensive and may be too complex for a small or medium sized computer hardware store to maintain and pay for.

Our Improvement over Current Solutions: Our solution will be more cost effective compared to existing ERP systems allowing it to be more accessible to smaller businesses. It will also be more user friendly for employees to use compared to a basic spreadsheet to track inventory. And since it will be digital, all of the negatives of using a pen and paper method to track inventory will be gone (lose/damage paper, can easily be altered, etc).

Proposed Solution

What this project achieves: Streamline inventory and order management by updating inventory as it changes (supplier deliveries, customers buying products). Allows for real time inventory monitoring, supplier delivery tracking, and simple pattern analysis.

Project will produce: A centralized database for managing inventory, orders and suppliers. A user-friendly web interface. Simple analytical tools to identify inefficiencies in order to find points of improvement. Customer order tracking.

Feature Description:

- **Centralized database:** links supplier, staff (employees and managers) and customers through a database of products supplied by suppliers to stores which are then bought by customers. Surplus items or direct customer orders can be checked. Availability of an item can be updated as well.
- **Simple analytical tools:** popular items based on what customer buy frequently (checks orders) and give suggestion to manager to increase order from supplier to ensure stock, employees service tracking (# of orders),
- **User friendly interface:** easy for employees to update stock, easy for customer to search for products, admin page to easily add or remove employees, under product shows stores that have the product, # availability at each store.

Motivation

Why you need our solution: Our solution addresses the unique needs of small to medium sized computer component stores by balancing cost-effectiveness with functionality and usability. Current systems are either too simplistic (spreadsheets) or excessively expensive (Oracle). By offering a simple yet effective database solution, our project will help to ensure inventory is tracked in real time, minimize delays and shortages, which will provide better customer experience

Why our project is unique: Unlike generic databases/solutions, our system will be specifically tailored for use in computer hardware stores by taking into account hardware generations, multiple suppliers for a single type of hardware, etc. It will also focus on ease of use for customers and employees, cost accessibility, and integration of key features such as supply tracking, inventory monitoring, item lookup, and customer order management. Our simple yet user friendly interface and analytical tools will further enhance its utility for the store.

Project Contributions : Project aims to give a more tailored database in computer hardware retail, adjusted for how rapidly things can change in the market. It also aims to bridge the gap between overly simplistic spreadsheets and too expensive existing database systems that will allow for more streamlined operation that is accessible to smaller brick and mortar stores.

Conclusion

Problem Summary: Inventory mismanagement leads to operational inefficiencies, customer dissatisfaction, and financial loss. Current solutions are either too inadequate or too expensive and inaccessible for small businesses. This results in the need of a tailored yet cost effective approach to inventory management and order management.

Motivation Summary: Efficient inventory management is key for timely operation of a store and maintaining customer satisfaction which keeps everyone happy. Our solution addresses gaps in current systems by providing a user friendly and affordable and robust alternative.

Proposed Solution Summary: Our proposed solution offers a centralized database with real time inventory tracking, supplier and customer order monitoring, and simple analytical tools to help in daily operations. It will be supported by a user-friendly web interface that is easy for people to work with and is tailored to the needs of small and medium sized stores.

Estimated timeline:

February 1 - February 14 - Initial pen and paper database design (entity, attributes and relationships), flesh out key features. We will also introduce hierarchy and inheritance to create an EER diagram.

February 15 - February 28 - Begin developing central database structure and core functionality.

March 1 - March 14 - implementation of the user interface and start testing basic workflows (inventory management and order processing).

March 15 - March 28 - develop and integrate simple analytical tools, refine user experience, and begin system error testing.

March 29 - April 3 - Final testing and preparation for demo of final product.

References

[1]<https://www3.technologyevaluation.com/solutions/48734/oracle-wms-cloud#:~:text=Oracle%20WMS%20Cloud%20Pricing,millions%20with%20on%2Dpremise%20WMS.>