

# **TECHNOLOGICAL INTEGRATION OF INVENTORY AND BILLING SYSYTEM AT USF STARBUCKS**

**Final Project Report**

**ISM 6124 - Adv Systems Analysis/Design**

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**Major in**

**BUSINESS ANALYTICS AND INFORMATION SYSTEMS**

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## **1. Introduction**

An Information system has been developed for integrating the web application for employee at the counter of Starbucks uses with the inventory database. This gives the employee real time data on the inventory levels if the product should be billed or not. This system is designed and developed for the Starbucks outlets at the University of South Florida.

## **2. Purpose and Scope**

- Often time while the customer is placing an order the item requested might not be in stock and the person will again have to have a quick chat with the customer apologizing and asking for a better suited replacement.
- If item is not present within the coffee shop, the system recommends the nearby coffee shop within the university (we can push the online orders to pick up from the other coffee shops nearby)
- This is the same case with the online orders as well.
- Such issues result in giving more/less than what the customer has actually paid for, leaving a bad customer experience.
- Monthly usage report of inventory of individual coffee shops will be generated and sent to inventory manager.
- Identification of popular products and making sure they are present in the inventory.
- Inventory planning withing the group of coffee shops (USF)
- In future there is a scope beyond the coffee shops for all the food chains in the USF.

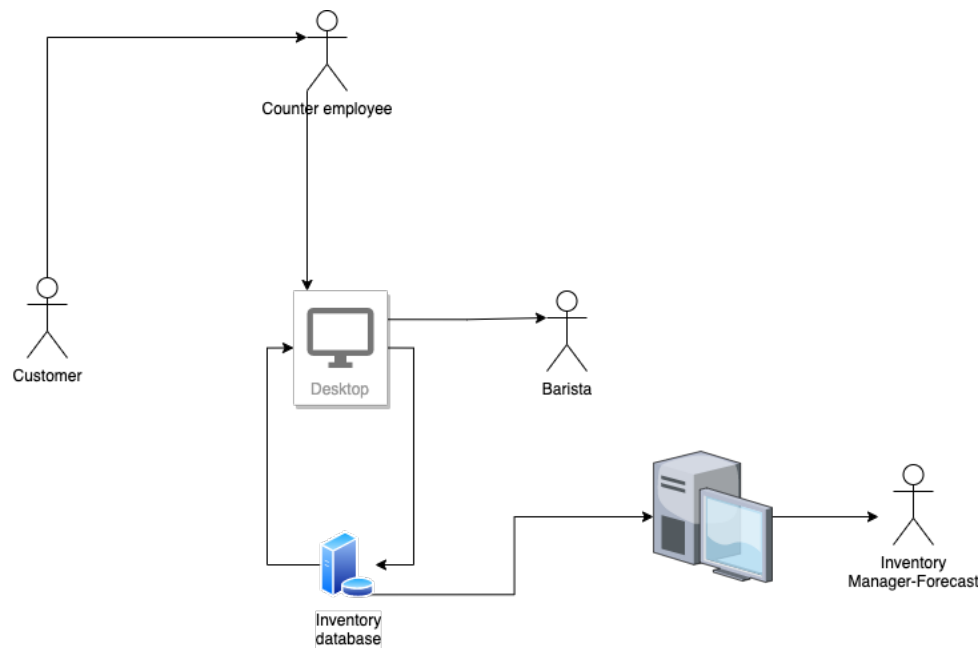
### **3.Project Executive Summary**

As mentioned above the scope of the project is limited to one of the outlets of Starbucks. The present system makes the customer interaction with the Starbucks smoother, saves times for both the customer and the Starbucks, further it gives the scope for the inventory manager to forecast demand for the upcoming month. Also, the costs are better managed by using this system as inventory can be forecasted well in advance. Also, the system helps in identifying the right number of staff in the coffee shop.

### **4.Management Overview**

The following are the objectives of building this information system:

- To build an information system that would integrate with the current stock available at the store and reflect in the billing systems.
- The value add of such system is that it would keep the baristas, staff and the managers informed of the status of availability, making it easy for the employees also helping the customer in hassle free purchase experience and improvising customer experience.



## 5. SWOT Analysis

### Strength:

Enhances customer interaction experience and improvising store performance and better cost management

### Weakness:

Staff needs to be trained to support the new IT system and costs involved in adopting the new system.

### Opportunity:

Automating manual processes (inventory update) and scaling it up to other food chains starting with coffee shop

### Threat:

In case of the system failure then it would take lot of time in processing the orders manually ,but we can mitigate this issue by maintaining multiple backup systems

## 6. Requirement Engineering

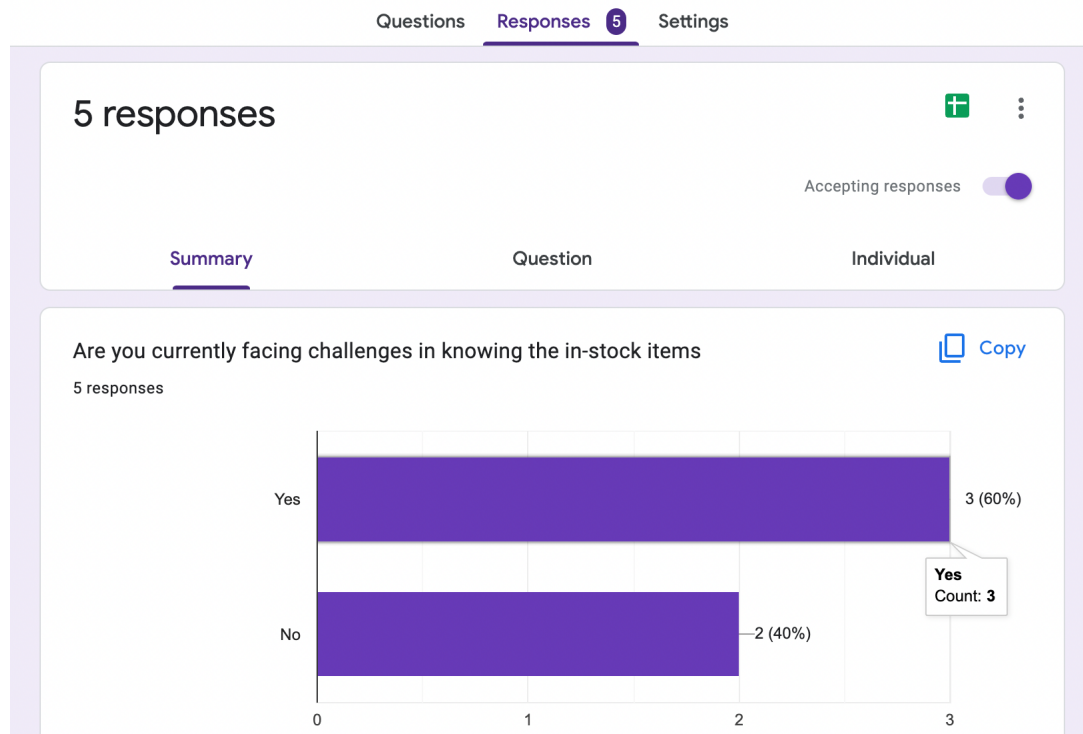
- **Collecting the requirements**

- We have sent a google survey link to the managers and the baristas at the location, to understand their requirements and challenges that they faced.
- In future we want to improvise this experience by collecting customer survey, similarly we want to improvise this for employees as well.

- **Google Survey Link**

- Link to the survey - <https://forms.gle/iy79U4KmSQD9mRJn9>

- **Responses**



If it's a yes, please elaborate on the challenges you are facing

3 responses

billing is done for out of stock items

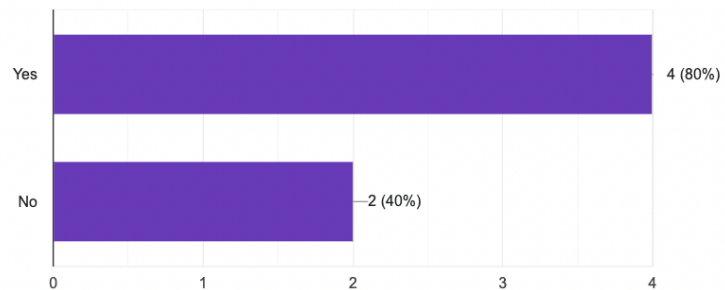
It's lot of manual work and it's hard to keep an update on what's in stock and not

There no system to know the availability of an item , we have to check it each time a customer asks for something.

Do you think you need a automated system or software for the day to day activities?

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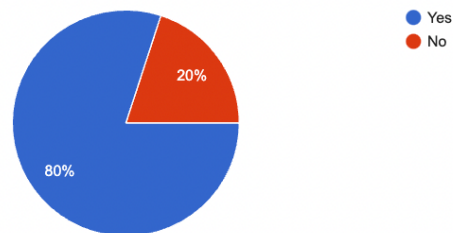
5 responses



Would you like if the status of the stock is updated on the billing system?

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5 responses

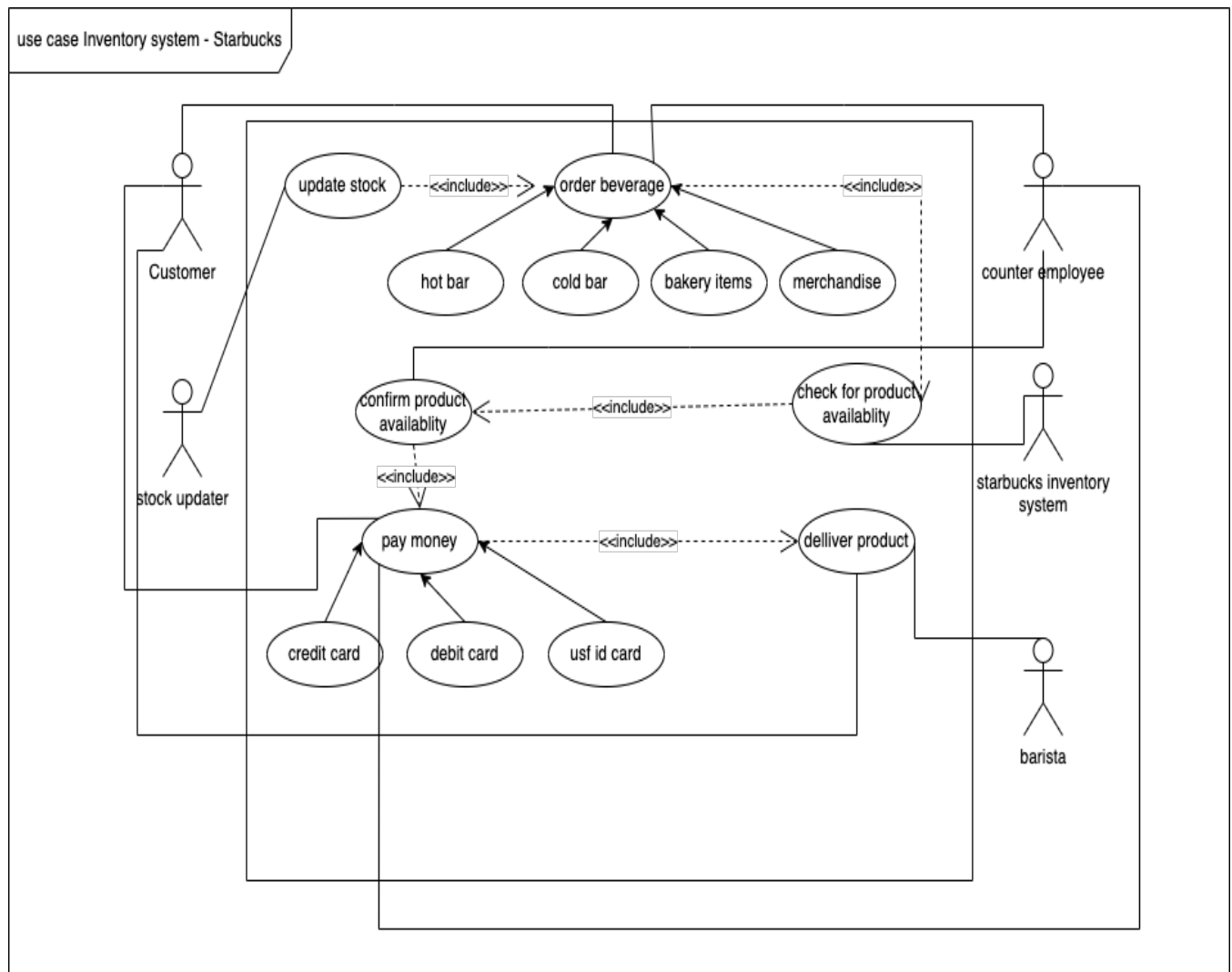


## 7. System Design

- We have designed Use case diagrams, Activity diagram, Class diagram, Sequence diagram, and deployment diagram for all the actors and activities involved in designing such software system.

- We have also defined the risk diagram that helps us choose the methodology for developing such system architecture at a later stage.

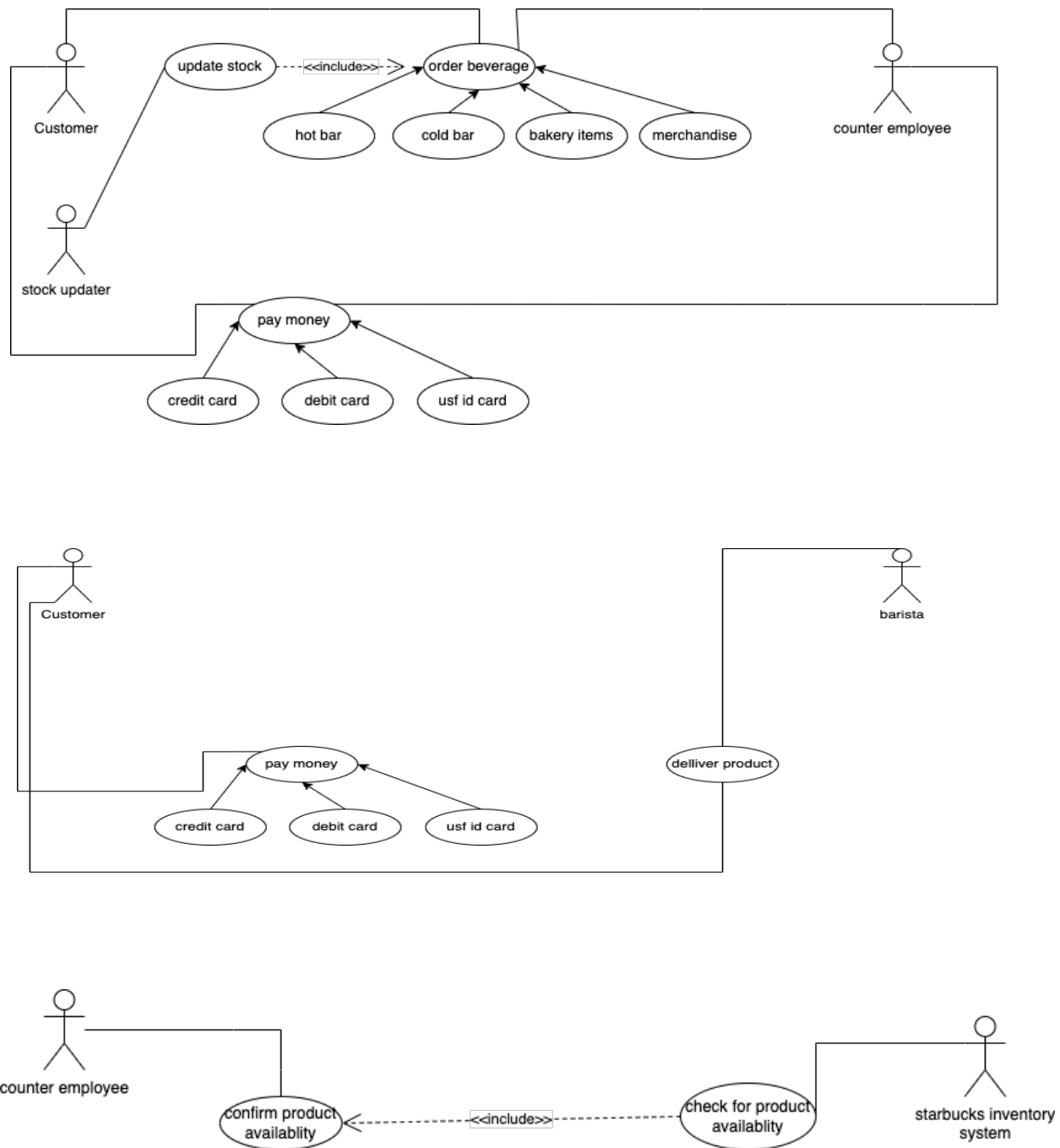
## 7.1 Use Case Diagram



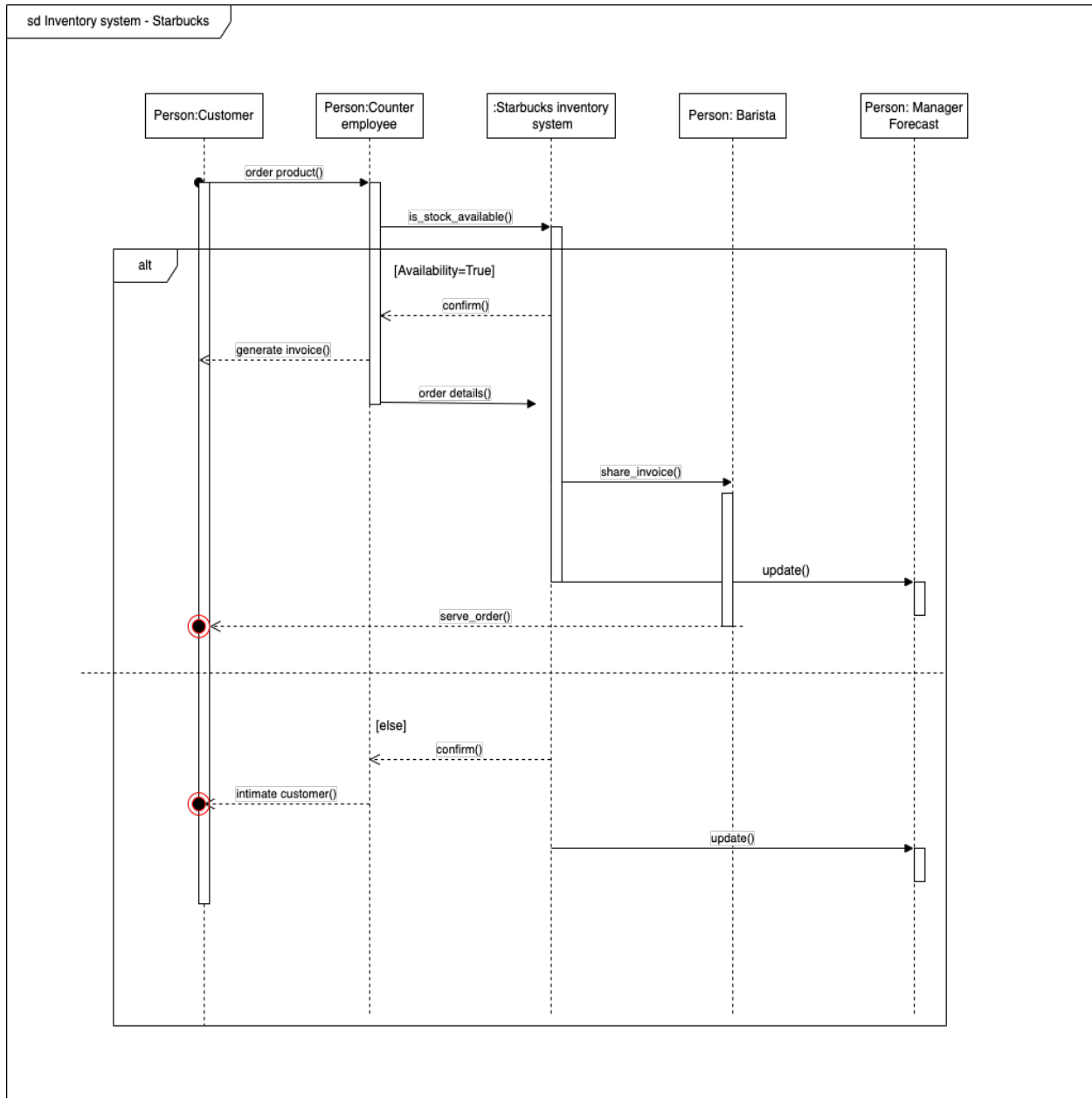
Various actors and use cases are depicted in the above figure. The interaction between the actors and use cases are depicted appropriately.



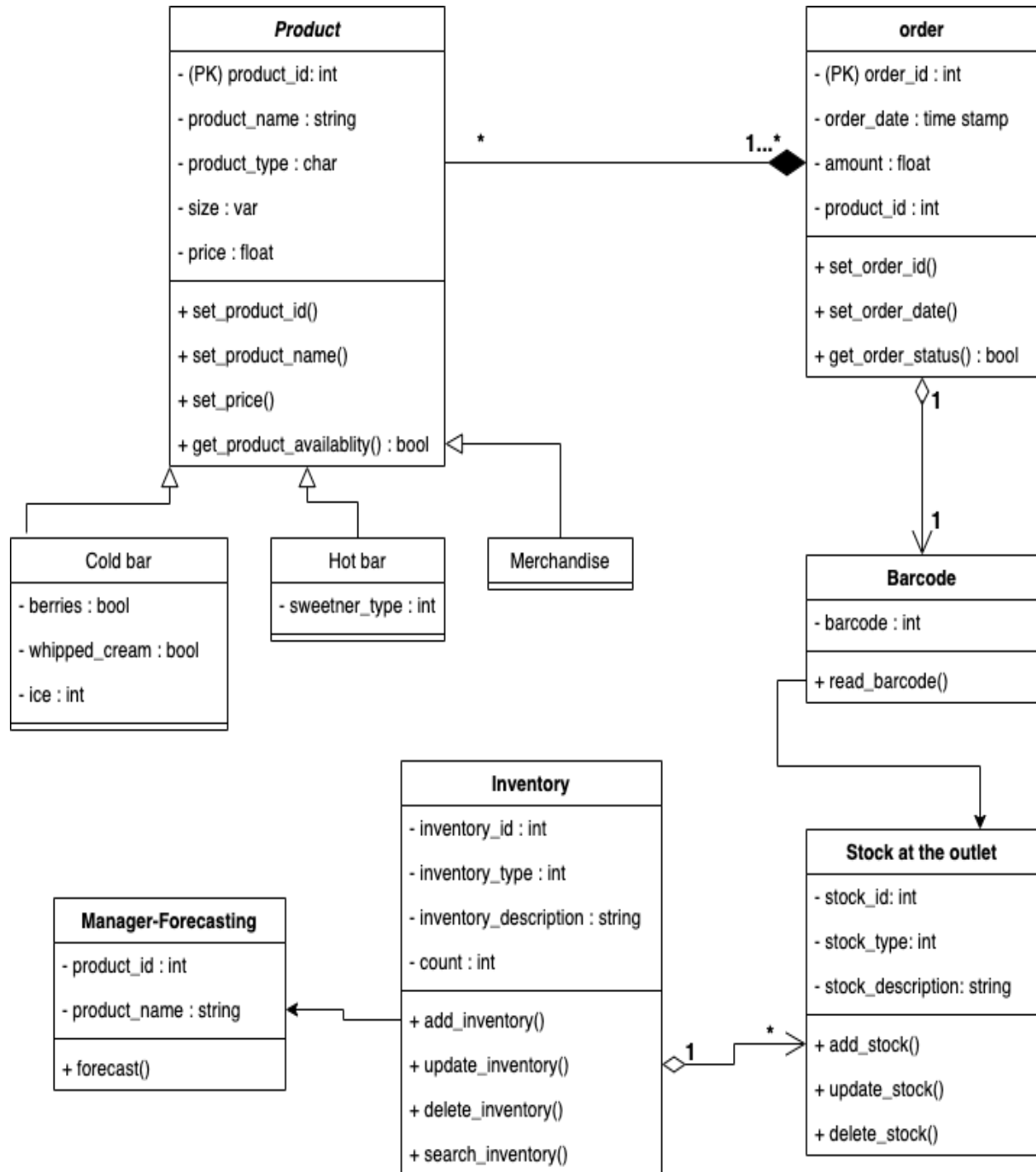
## 7.2 Individual Use Case Diagrams



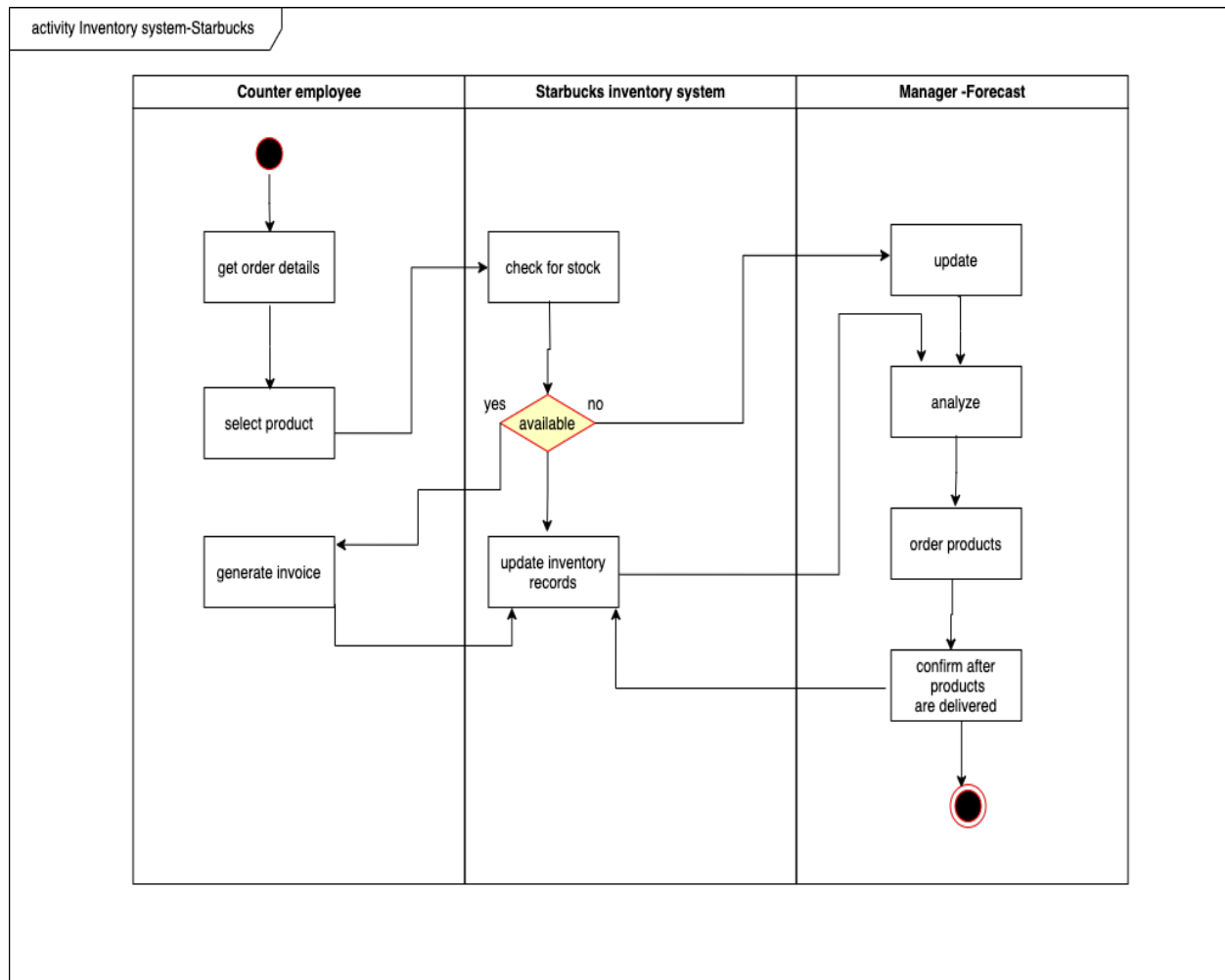
## 7.3 Sequence Diagram



## 7.4 Class Diagram

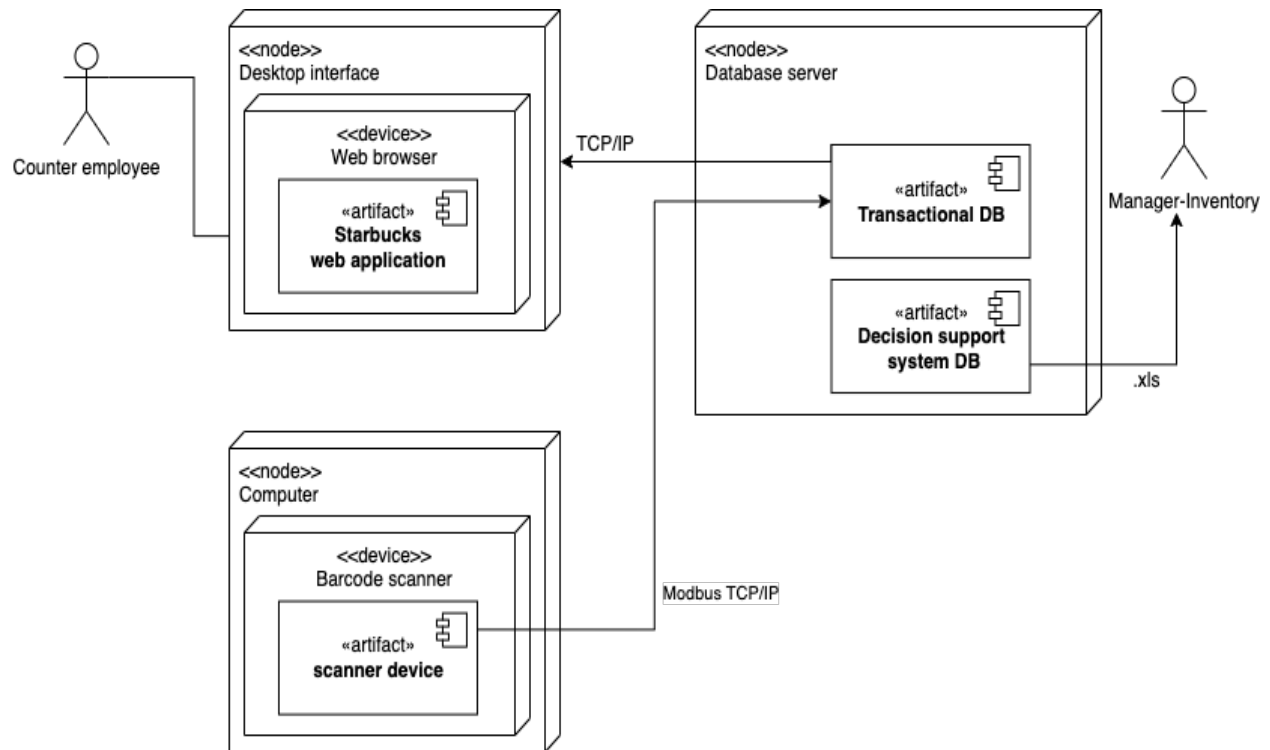


## 7.4 Activity Diagram



Three swim lanes have been created to keep the system simple. The information flow is a typical customer interaction with the Starbucks.

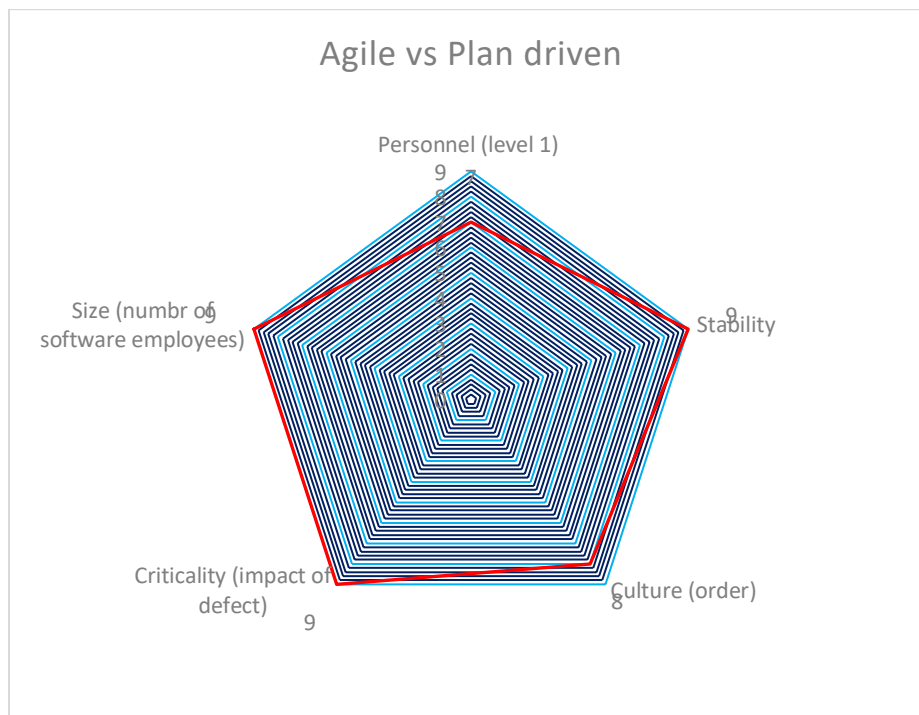
## 7.4 Deployment Diagram



The infrastructural modelling above represents three deployed nodes. One of them being desktop interface in which the Starbucks website runs, the second node is computer where the barcode scanner device is connected using Modbus TCP/IP internet connection. The third node is a Database server where there are two databases (Transactional and Decision support system) the customer receipts are directed to the transactional database and the forecasting data is directed towards the decision support database.

## 8. Selection of Software methodology

By evaluating the five factors of quality of employees, size of the organization, stability of the software environment, criticality of the project and culture of the organization the radar chart is plotted and it is found out that the project leans towards plan driven methodology.



## 9. Analysis

Based on store managers and baristas feedback we concluded that the system is very useful for maintaining best customer satisfaction and cost management.

## **10. Conclusion**

Based on our surveys we thought that there is lot of scope to enhance the system to multiple food chains along with the present coffee chains, that would save us lot of time and money for business owners.

## **11. Recommendations**

- We require hardware changes at the coffee shops to support this new user interface like iPad, barcode scanners etc.
- IT training is required for store managers and employees to implement the system.

## **12. Lessons learnt**

- We need to invest lot of time and effort to create use cases to support multiple food chains like coffee shops.
- It requires regular maintenance and enhancements to maintain good user experience.
- It involves lot of maintenance costs.

## **13. References**

- Balancing Agility and Discipline: A Guide for the Perplexed 1st Edition by Barry Boehm, Richard Turner, Grady Booch, Alistair Cockburn.
- Guide to data modelling William E. Burrows Copyright ©1999 William E. Burrows
- An Introduction to the Unified Modeling Language © Laurie Williams 2004