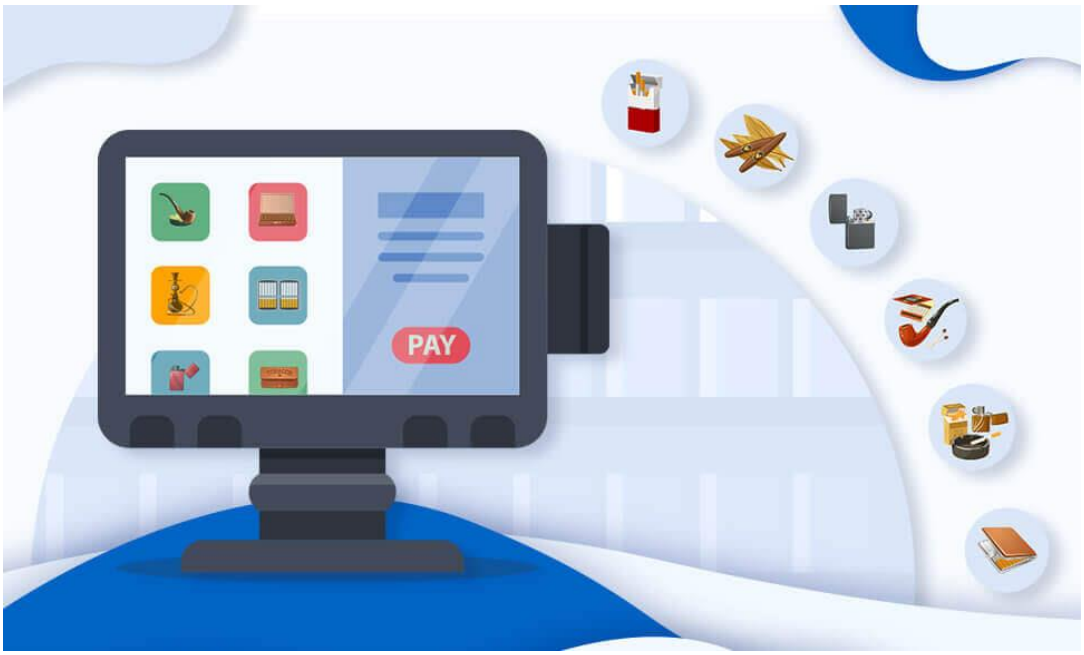
POS System

- **What Is POS ?**

  A POS (Point of Sale) is a system that is used for your business that allows your business to accept payments from customers and keep track of sale

- **What does POS system do ?**
  - A customer decides to buy your product or service
  - Your POS system calculates that price of the item
  - Your customer pays



The Case

In our case the client asked for a system to manage his store the system must contains cashiering system which is a group of small systems all groups together to form one big system helps him .those small systems or services are as following :

- **POS System :** to track selling process and make it (faster) and record on the system and also pricing catalog merged to this system to help him remember the prices of the goods and print recite
- **Stock System :** to keep the warehouse organized and goods countable which will make it more easier for him to know which goods are not available or about to sold out and the goods which he have a good stock of it
- **Bar Code System :** with the help of the POS system he can give all the goods at his store a unique bar code to know

which good is sold and when and of course the price will be on the bar code her we managed to make the selling process faster which needed by the client

- **Analysis System :** the client asked for a system can track his profit percentage along some periods(weeks , months
- **Log in System :** Different accounts for the owner and the workers with different specifications.

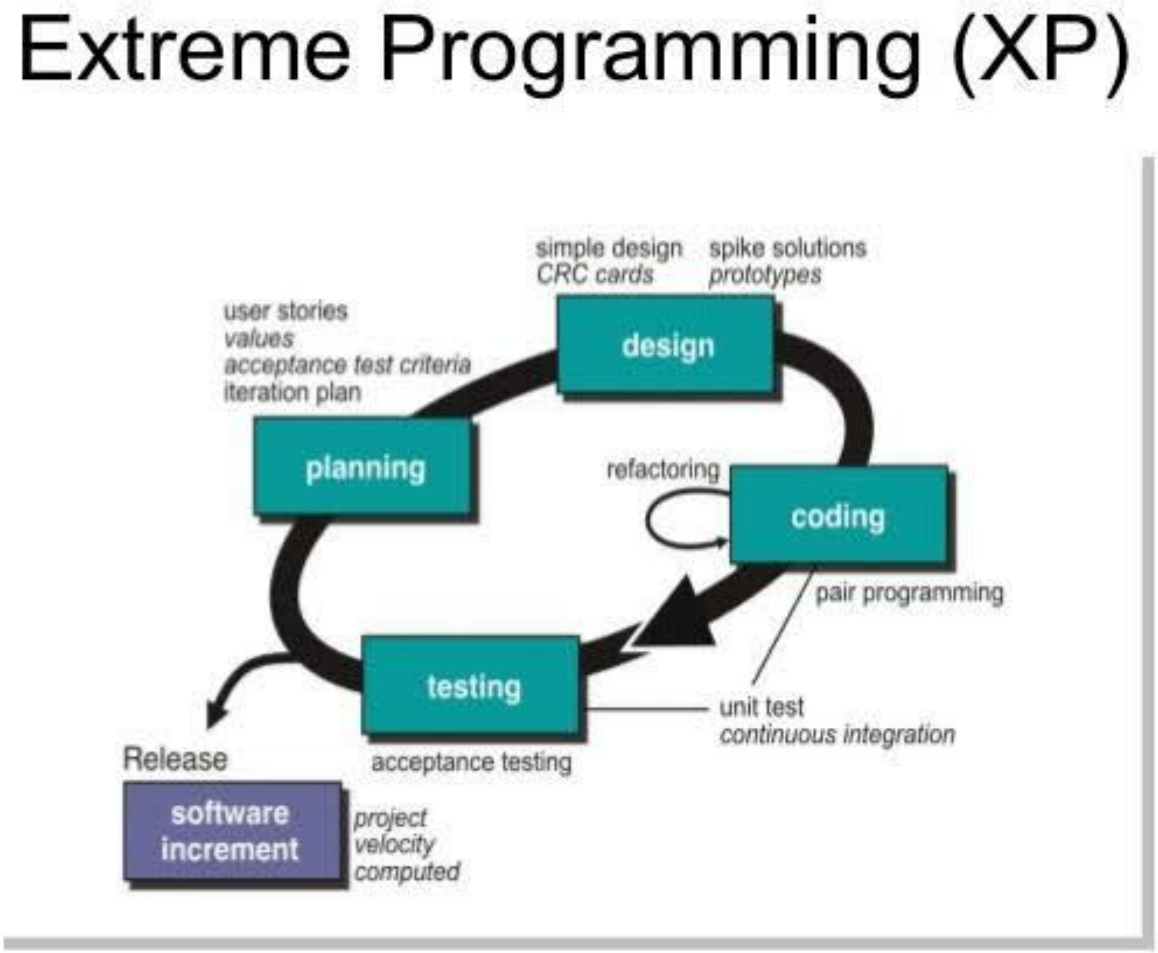
Model

Agile XP Model:

4 Framework must be define :-

1 – Planning
2 – Design
3 – Coding

4 – Testing



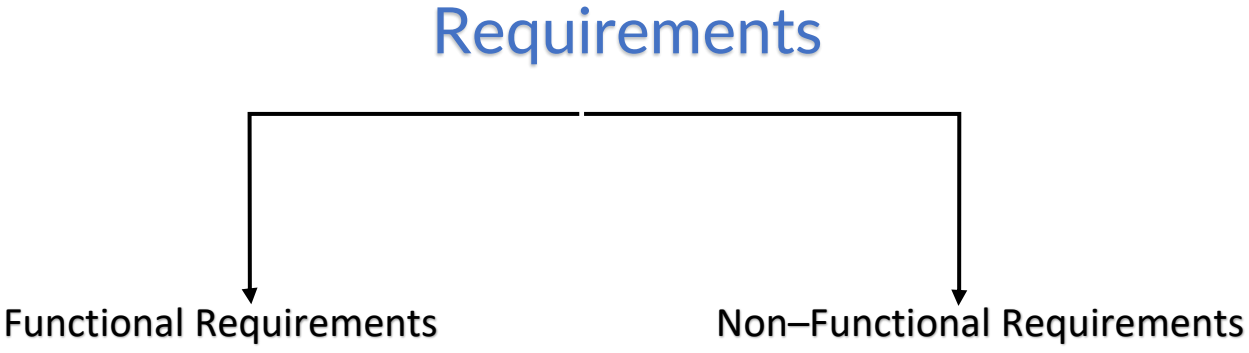
Why agile Model ?

1. where requirements and solutions evolve through collaboration between us , self-organizing, and cross-functional teams.

2. Requires customer feedback any time.

3. Iterative and Incremental development is at the heart of a cyclic software development process developed in response to the weaknesses of the waterfall model.

4. The main advantage of Extreme Programming is that this methodology allows software development companies to save costs and time required for project realization.



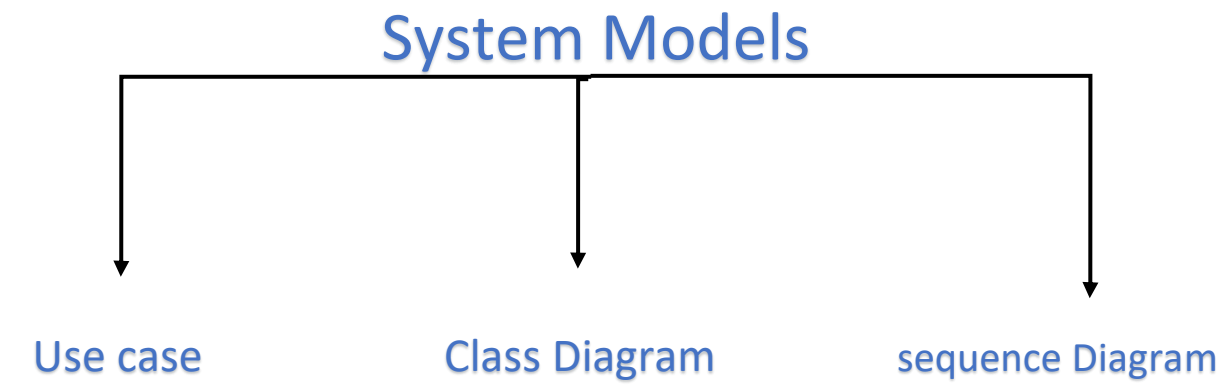
5. Functional Requirements:

- **Modify accounts : admin add and block accounts**
- **Log in : Admin and each employee has an account , They log in into account and verified by Database**
- **Add items : Admin store items in the stock with (id – name – price – count)**
- **Delete items : Admin delete items from stock**
- **Update items : Change the price of item**
- **Make order : by reading bar code from item**
- **Store order : after reading bar code this item count will be decreased from stock and increased in the sold count**
- **Void order : remove items from order**
- **Refund order : return order within 14 day**
- **Calculate sub total : count each item and multiply it by each price**
- **Calculate total tax : sum all sub totals**
- **Print receipt : included name of items, count and total price ,Id**
- **Payment : The customer pays cash**
- **Analysis and statistics report : Report on all revenues every month to know the most sold items and least sold items**

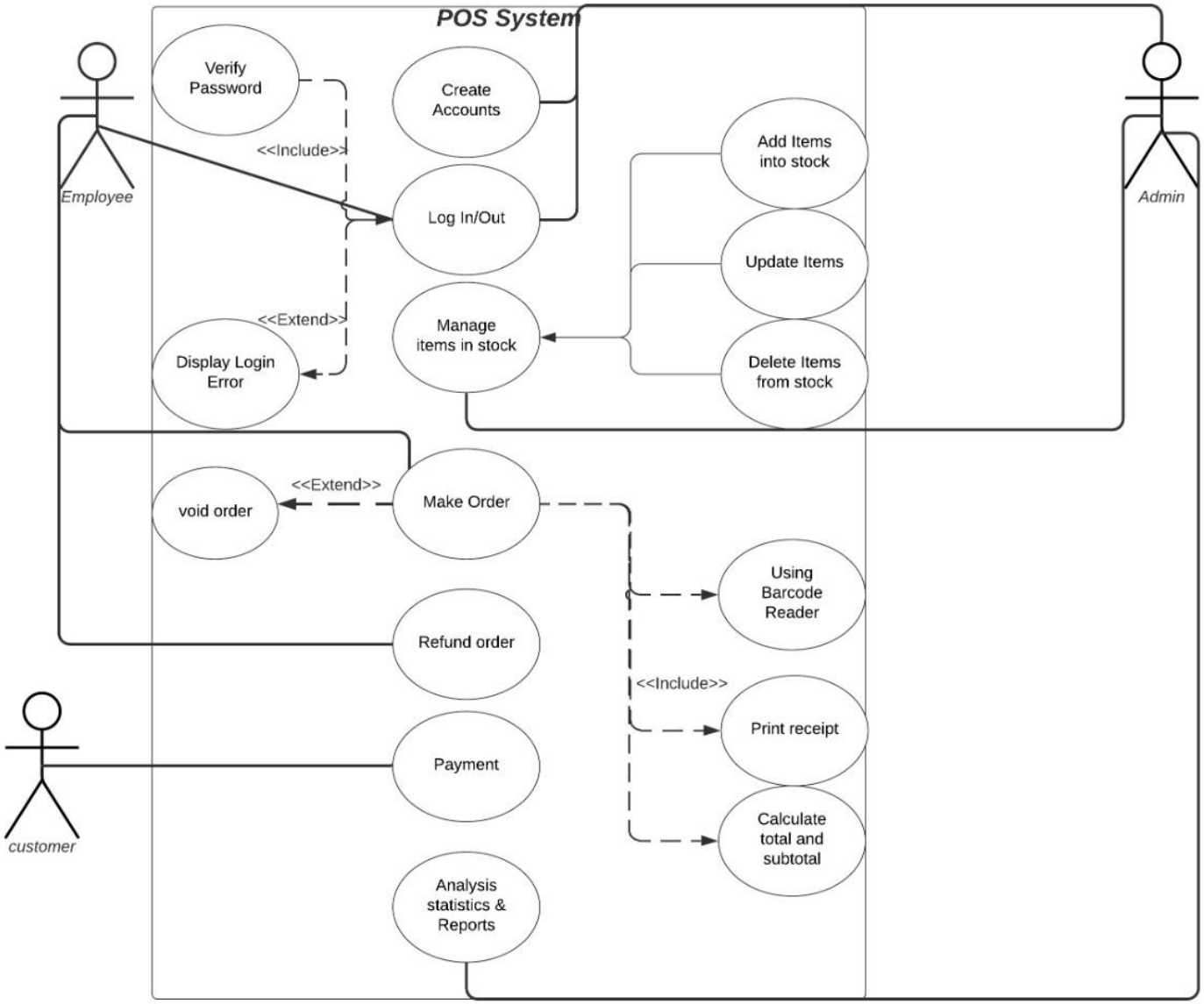
6. Non – Functional Requirements:

- **Maintainability : to maintain the software system if needed**

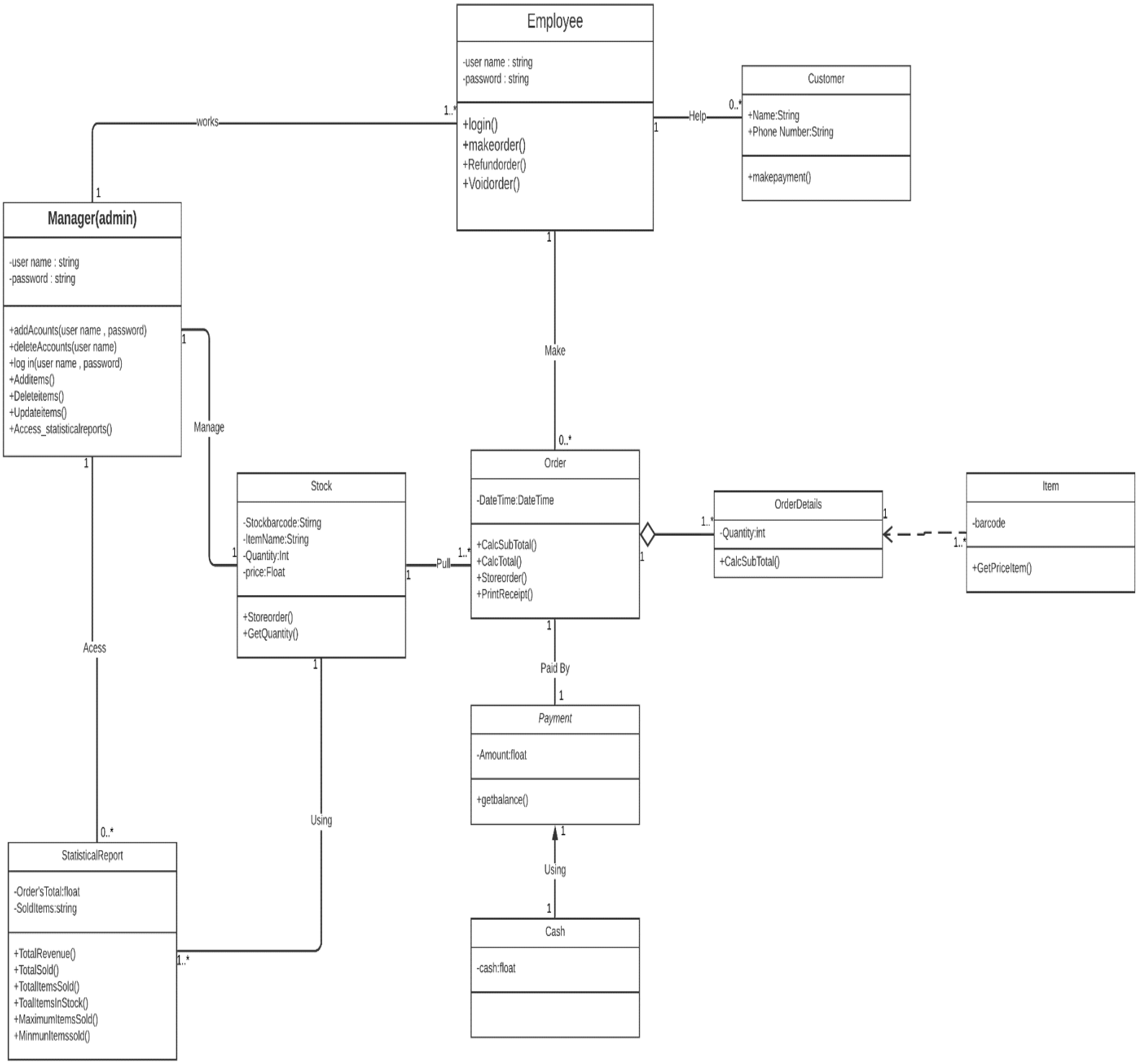
- **Easy to use**
- **Color blindness : " Friendly " it hard to tell the difference between red & green and blue & yellow**
- **Java language : Java is a high – level , class – based , object – oriented language that is designed to have as few implementation dependencies as possible**
- **Database : MySQL**
- **Efficiency : POS system must work at peak performance and time response < 5 seconds & space 1500 Kb**
- **Usability : is a measure of how well a specific user in a specific context can use a software to achieve a defined goal effectively**



7. Use Case



8. Class Diagram :


Employee
-user name : string
-password : string
+login()
+makeorder()
+Refundorder()
+Voidorder()
works
1..*
1
Help
0..*
Customer
+Name:String
+Phone Number:String
+makepayment()
Manager(admin)
-user name : string
-password : string
+addAcounts(user name , password)
+deleteAccounts(user name)
+log in(user name , password)
+Additems()
+Deleteitems()
+Updateitems()
+Access_statisticalreports()
Manage
Make
0..*
Order
-DateTime:DateTime
+CalcSubTotal()
+CalcTotal()
+Storeorder()
+PrintReceipt()
Stock
-Stockbarcode:Stirng
-ItemName:String
-Quantity:Int
-price:Float
+Storeorder()
+GetQuantity()
Pull
1..*
OrderDetails
-Quantity:int
+CalcSubTotal()
Item
-barcode
+GetPriceItem()
Acess
Paid By
Payment
-Amount:float
+getbalance()
Using
Cash
-cash:float
StatisticalReport
-Order'sTotal:float
-SoldItems:string
+TotalRevenue()
+TotalSold()
+TotalItemsSold()
+ToalItemsInStock()
+MaximumItemsSold()
+Minmumitemssold()

Class id	Class Name	Subsystem id	Description
1	Manger	**None**	Add and Block accounts , manage the stock , access to the statistical report
2	Employee	**None**	Log in into the system , Make , void and refund order
3	Customer	**None**	Pay cash to the employee
4	Stock	**None**	Store order and get quantity
5	Order	**None**	Calculate total tax , store order , get receipt
6	Order Details	**None**	Calculate sub total
7	item	**None**	To know item price
8	Statistical Report	**None**	Include total (revenue – sold – items sold – maximum and minimum item sold)
9	Payment	**None**	To get balance
10	Cash	**9**	Customer pays cash to the employee

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9. :Sequence Diagram

-: Two sequence Diagram

10. " Sequence Diagram " 1

- **Actors : Admin**
- **Object : Interface and System**

1 – Admin request system to create an account and choose the account type (Admin or employee)

2 – System request user name and password to create new account then Admin enter them

3 – System store user name and password in database

4 – Admin need to login , System request user name and password to verfiy them from database “ if username and password is wrong “ system will display error message

5 – System show to admin 3 actions “ Manage Stock , Manage accounts and show statistical report “ and admin choose one

6 – if condition to take action

11. "Sequence Diagram "2

- **Actors : Employee and Cutomers**
- **Object : Interface and System**

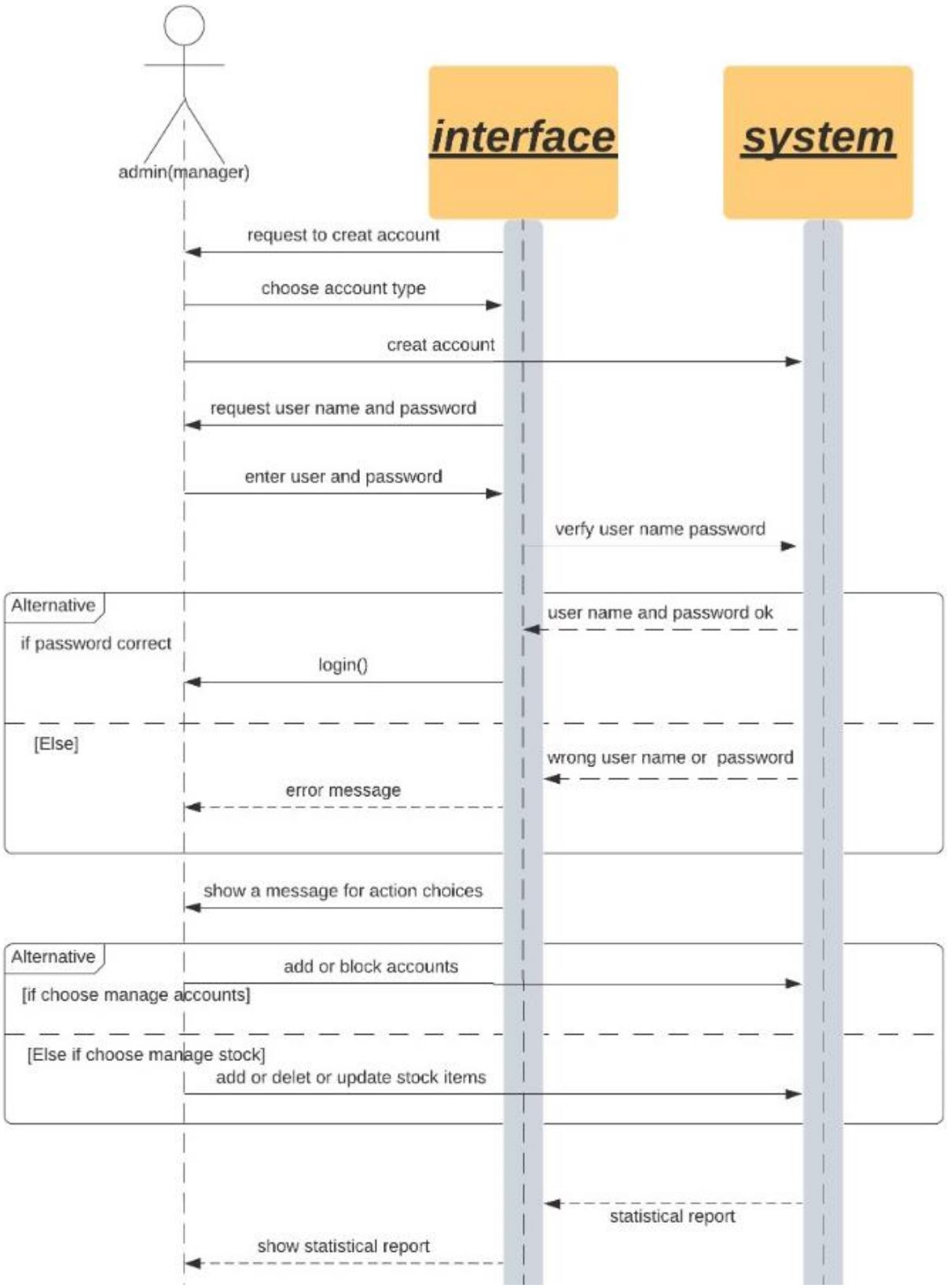
1 – employee need to login , system request username and password to verify them from database “ if username and password is wrong “ , system will display error message

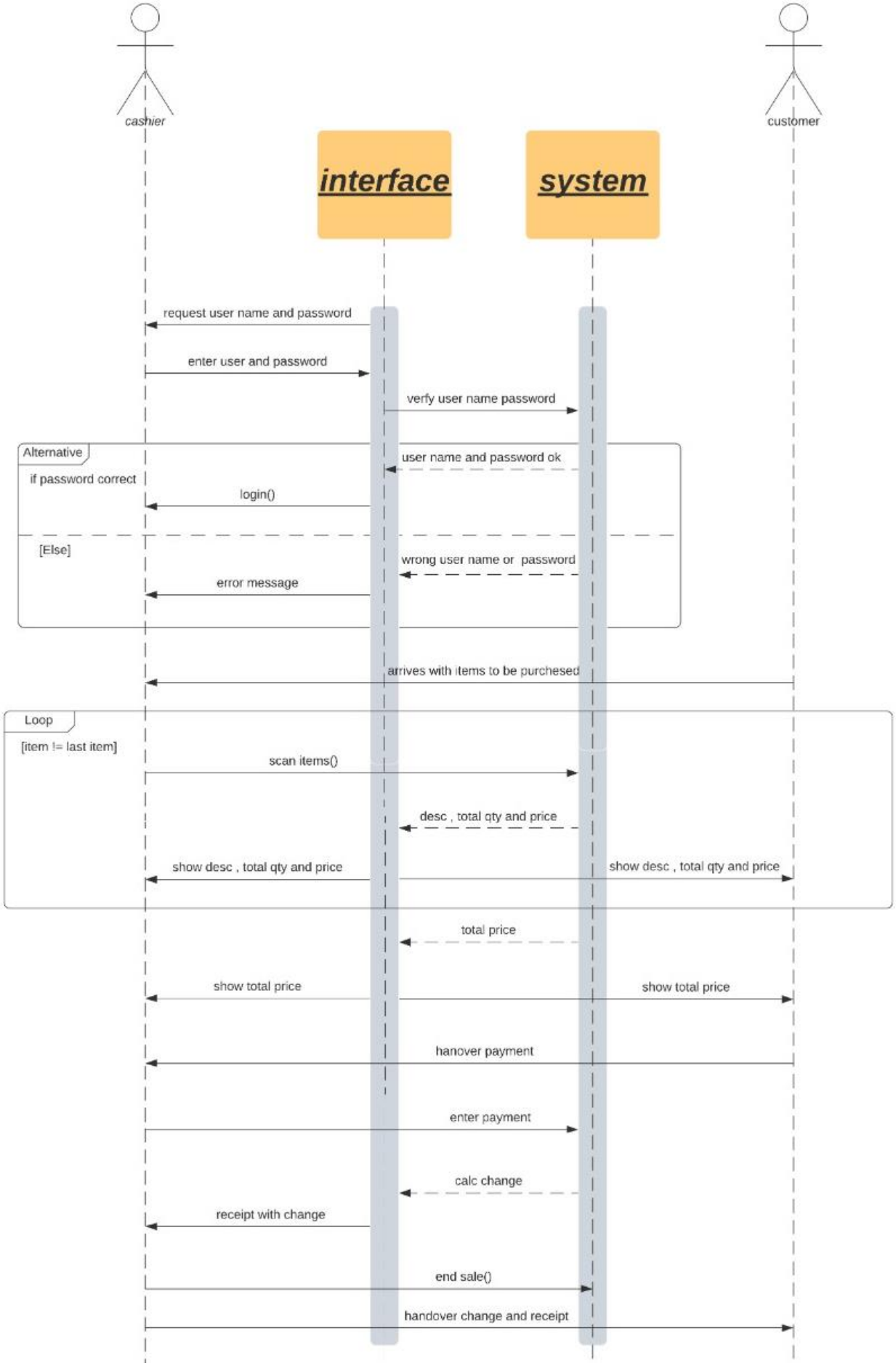
2 – customer arrives with items to purchesed

3 – employeee scan items by barcode reader

4 – system return item (description , total quantity , and price)

5 – interface disply item (description , total quantity and price)
6 – system calculate total price and interdace display to cutomer and emplyee
7 – customer pays cash and get the receipt included (price , items name)
8 – end sale


admin(manager)
interface
system
request to creat account
choose account type
creat account
request user name and password
enter user and password
verfy user name password
Alternative
if password correct
user name and password ok
login()
[Else]
wrong user name or password
error message
show a message for action choices
Alternative
[if choose manage accounts]
add or block accounts
[Else if choose manage stock]
add or delet or update stock items
statistical report
show statistical report


cashier
interface
system
customer
request user name and password
enter user and password
verfy user name password
Alternative
if password correct
user name and password ok
login()
[Else]
wrong user name or password
error message
arrives with items to be purchesed
Loop
[item != last item]
scan items()
desc , total qty and price
show desc , total qty and price
show desc , total qty and price
total price
show total price
show total price
hanover payment
enter payment
calc change
receipt with change
end sale()
handover change and receipt

10.Risk

Risk	Probability
It is impossible to recruit staff with the all required skills for the project	High
Faults in reusable software components have to be repaired before these components are reused. (2).	Moderate
Changes to requirements that require major design rework are proposed	low
The database used in the system cannot process as many transactions per second as expected	high
Hackers can infiltrate network and software weakness setups and steal valuable information, such as cash in our store	low
Didn’t put a password on every device	Moderate
Forget backing up our data	high

11.Test Case

Test id	Test case	Test steps	Test data	Expected result	Actual result	Status
001	Check create account successful	1-open POS software 2-choose create account 3-enter data	Username=ahmed Password=ahmed11	create Ahmed's account	As Expected	pass
002	Check create account failed	1-open POS software 2-choose create account 3-enter data	Username=ahmedاحمد Password=	Failed in creating a account	As Expected	pass
003	Check account Login with valid Data	1-open POS software 2-choose login 3-enter data	Username=ahmed Password=ahmed11	Log in successful	As Expected	pass

004	Check account Login with invalid Data	1-open POS software 2-choose login 3-enter data	Username=ahmed Password=ahmmmm	failed log in	As Expected	pass
005	Add items with valid data	1 – open pos system 2 – log in as admin 3 – add items	Id = 1 Name = cd Price = 2 $ Count = 10	Added successfully	As Expected	pass
006	Add items with invalid data	1 – open pos system 2 – log in as admin 3 – add items	Id = 1 Name = memory Price = 5 $ Count = 15	Added failed	As Expected	pass
007	Delete items	1 – open pos system 2 – log in as admin 3 – choose item 4 – delete item	User need to choose item	Deleted successfully	As Expected	pass

008	Update item	1 – open pos system 2 – log in as admin 3 – choose item 4 – update item	User need to choose item	Updated successfully	As Expected	pass
009	Make order with valid data	1 – open pos system 2 – log in as employee 3 – scan item	Scan item by barcode reader	Show price , name , count	As Expected	Pass
010	Make order with invalid data	1 – open pos system 2 – log in as employee 3 – scan item	Scan item by barcode reader	Item not exist	As Expected	Pass

011	Store order with valid data	1-open pos system 2 – log in as employee 3-make order	Make order using barcode reader	After reading bar code this item count will be decreased from stock and increased in the sold count	As Expected	Pass
012	Store order with invalid data	1-open pos system 2 – log in as employee 3-make order	Make order using barcode reader	Item not exist	As Expected	pass
013	Void order	1-open pos system 2 – log in as employee 3-make order 4- void order	while processing order customer decided to cancel an item purchase Action : Employee remove the items from this process	Item not exist	As Expected	pass

014	Refund order with valid data (less than 14 days)	1-open pos system 2 – log in as employee 3-make order 4-end order 5-Refund order	Refund order using receipt's ID	Id is founded	As Expected	pass
015	Refund order with invalid data (more than 14 days)	1-open pos system 2 – log in as employee 3-make order 4-end order 5-Refund order	Refund order using receipt's ID	Id is founded but after 14 days	As Expected	pass

016	Calculate sub total With valid data	1-open pos system 2 – log in as employee 3-make order	Make order using barcode reader	Show price for each item	As Expected	pass
017	Calculate sub total With invalid data	1-open pos system 2 – log in as employee 3-make order	Make order using barcode reader	Item not exist	As Expected	pass
018	Calculate total tax	1-open pos system 2 – log in as employee 3-make order	Make order using barcode reader	Show price for total items	As Expected	pass

019	Print receipt	1-open pos system 2 – log in as employee 3-make order 4-end order	After ending order print receipt	Show id, Price for each item, Price for total items, Date & time	As Expected	pass
020	Payment	1-open pos system 2 – log in as employee 3-make order 4-end order	After ending order customer handover cash	Save cash	As Expected	pass
021	Analysis and statistics report	1 – open pos system 2 – log in as admin 3-Analysis and statistics report	Admin needs to choose Analysis and statistics report	Show Total Revenue, Total sold, Total items sold, Total Items in stock, Max& Min Items sold	As Expected	pass

12.Test Techniques

Tests will be done by black box techniques

ID	Test Technique	Test Case
T1	Equivalence Partitioning	001:002 005:015
T2	Decision Table Testing	003:004 016:018 019
T3	Cause – effect graph	019

13.Time

T1 : Modify accounts : admin add and block accounts

T2: Log in : Admin and each employee has an account , They log in into account and verified by Database

T3: Add items : Admin store items in the stock with (id – name – price – count)

T4: Delete items : Admin delete items from stock

T5: Update items : Change the price of item

T6: Make order : by reading bar code from item

T7: Store order : after reading bar code this item count will be decreased from stock and increased in the sold count

T8: Void order : remove items from order

T9: Refund order : return order within 14 day

T10: Calculate sub total : count each item and multiply it by each price

T11: Calculate total tax : sum all sub totals

T12: Print receipt : included name of items, count and total price

T13: Payment : The customer pays cash

T14: Analysis and statistics report : Report on all revenues every month to know the most sold items and least sold items

Dependency

T1		2 DAYES
T2	T1	2 DAYES
T3	T2	1 WEEK
T4	T2	4 DAYES
T5	T2	4 DAYES
T6	T2	15 DAYES
T7	T6	4 DAYES
T8	T7	2 DAYES
T9	T7	2 DAYES
T10	T6 & T3	1 DAY
T11	T10	1 DAY
T12	T7 & T11	3 DAYES
T13	T12	4 DAYES
T14	T7 & T11 & T13	5 DAYES