Requirements Document

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Contents

Essential description

Small shops require a simple application to support the owner or manager. A small shop (ex a food shop) occupies 50-200 square meters, sells 500-2000 different item types, has one or a few cash registers EZShop is a software application to:

- manage sales
- manage inventory
- manage customers
- support accounting

Stakeholders

Stakeholder name	Description
Company	the company that produces and sells the application
Developer	Who develops the application, and all the future relises
Maintainer	Who updates the application whenever a new release is ready
Administrator	Who manages the users
Store Manager	Buyers of the application, owners of the store
Cashier	An employee who totals purchases and collects payment from customers
Warehouse worker	employee responsible of receiving and processing incoming stock and materials, picking and filling orders from stock
Customer	Buyers of products
Supplier	Who delivers products to the store
Product	Item to be sold
Cash	money in the form of coins or banknotes
Payment card	a card that entitles a person to make purchases
Payment terminal	the system to manage payment with a credit card
Fidelity Card	A card which rewards customers that make regular purchases
Internet Service Provider	organization that provides internet service

Context Diagram and interfaces

Context Diagram
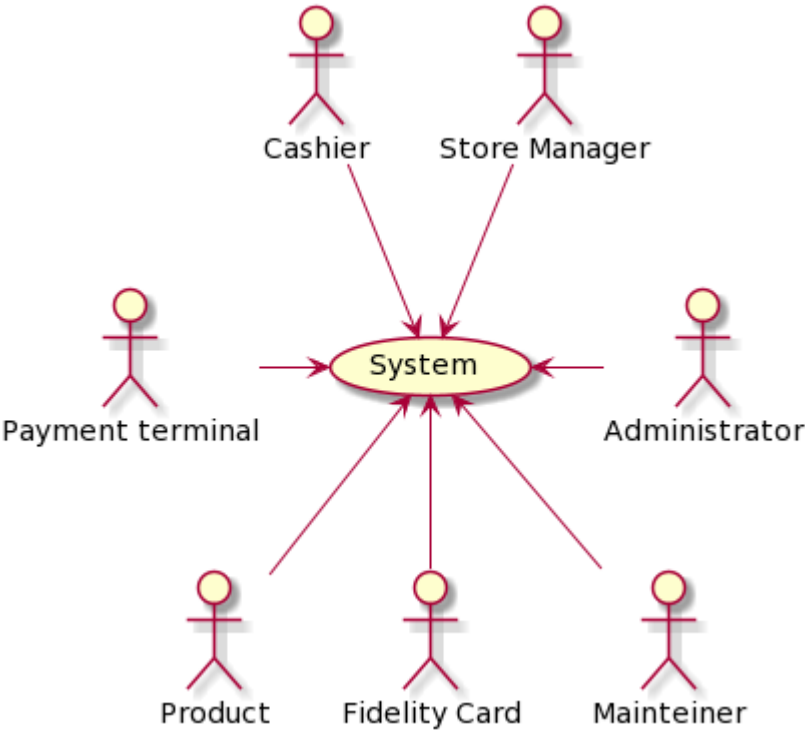
Interfaces

Actor	Logical Interface	Physical Interface
Cashier	GUI	touchscreen
Store Manager	GUI	keyboard, mouse, PC
Administrator	GUI	keyboard, mouse, PC
Mainteiner	GUI	keyboard, mouse, PC
Product	barcode	barcode reader
Payment terminal	web services	ethernet cable
Fidelity Card	barcode	barcode reader
internet	web protocols	modem/router

Stories and personas

John

John is the store manager of a small shop. He works 5 days a week (from Tuesday to Saturday), from 8.00 Am to 6.00 Pm.

Story 1

Every morning John opens the shop, and goes to his office. Since he needs to check the inventory and the catalogue, he logs into the application to keep track of the products of the store, so that he can contact suppliers for delivering orders.

Story 2

Once a week, on Friday afternoon, John needs to manage the store's accounting to keep track of the incoming, using the PC.

Story 3

On wednesday a young lady appeared in the shop. She, after asking to cashier that wants to be registered with a fidelity card, is sent to John's office. Here John inserts the customer data into the application and gives the card to the customer so she can proceed to purchase some goods.

Story 4

On saturday usually a new stock of products is delivered to John's shops. John before leaving the office would like to update the previous order in the inventory.

Marta

Marta is a young 22 yold software engineering student, *very good in math*, working part-time as cashier in the store. During the morning she follows university lectures, after that, in the afternoon, she works at the store form 2.00 Pm to 7.30 Pm. At the end of the working day, since usually is the last employee in the shop, she closes the store.

Story 1

Marta as always is sitting in her working place at POS, while reading the customer's products for the checkout. After some products have been read correctly, one is not read by the barcode because it's scratched. So Marta has to insert it in the cash register manually using the digits on the product, as fast as possible, because others customers are waiting in queue.

Story 2

Marta is interrupted by a customer while she was doing the checkout for him. The customer says that he forgotten the wallet at home, apologizing for that he helps Marta to put aside the products then he leaves the store. Marta after moving the products to put them back on the shelves, deletes the shopping list from the checkout and starts a new one for the next customers.

Story 3

A clumsy customer, after counting the change for a few moments, realize that doesn't have enough money to pay his bill in cash so he tells it to cashier Marta. She proceeds to change the payment method and enables the credit card terminal to complete the purchase. After successful payment the customer greets her and leaves the store.

Story 4

Marta, tired for the long day at university, makes a mistake and scans a product two times in a row. She realize it watching the display of the POS indicating the total quantity of the last scanned product. To solve the

inconvinient the cashier has to remove from the checkout by deleting the duplicate so she can keep scanning
the barcode of others products.

Story 5

Mark, a loyal customer and a close friend of Marta, shows up at the POS with few products to pay. Marta that
knows well Mark ask him immediatly his fidelity card and scan it with the barcode reader. Then Mark ask for a
discout. Marta shows him his fidelity points balance and tells him that can have a 10€ discount. Mark acept it
and proceeds to pay the store bill.

Functional and non functional requirements

Functional Requirements

ID	Description
FR1	**handle sale transaction**
FR1.1	open sale transaction
FR1.2	close sale transaction with success
FR1.3	cancel sale transaction
FR1.4	modify current transaction
FR1.5	handle payment
FR1.5.1	handle cash payment
FR1.5.2	handle payment terminal data
FR1.5.2.1	receive data
FR1.5.2.2	send data
FR2	**read product barcode**
FR2.1	retrieve product name
FR2.2	retrieve product price
FR3	**read fidelity card barcode**
FR3.1	retrive customer account
FR3.1.1	read points
FR3.1.2	apply discount
FR3.1.3	update points
FR3.2	link barcode to customer account
FR4	**manage user authentication**

ID	Description
FR4.1	create account
FR4.2	delete account
FR4.3	modify account
FR4.4	log in
FR4.5	log out
FR5	**manage products inventory and catalogue**
FR5.1	add product
FR5.1.1	add quantity
FR5.1.2	add purchase and selling price
FR5.2	delete product
FR5.3	update quantity
FR5.4	update product price
FR5.5	check quantity
FR5.6	search product
FR5.7	create products list
FR5.8	delete products list
FR5.9	add product to the list
FR5.10	remove product from the list
FR6	**handle suppliers order**
FR6.1	insert an order
FR6.2	delete an order
FR6.3	show orders
FR6.4	search an order
FR6.5	change order status
FR7	**support accounting**
FR7.1	add a sold product
FR7.1.1	add a date and id
FR7.2	add a purchased product
FR7.2.1	add a date and id
FR7.3	search in accounting

| ID	Description	
FR7.3.1	show income for a time period	
FR7.3.2	show outgoings for a time period	
FR7.3.3	show profit for a time period	
FR7.3.4	show income for a given product	
FR7.3.5	show outgoings for a given product	
FR7.3.6	show profit for a given product	
FR8	**manage updates**	

Non Functional Requirements

ID	Type (efficiency, reliability, ..)	Description	Refers to
NFR1	usability	a cashier should be capable to use the POS GUI in less than 2 hours	FR1
NFR2	usability	a manager should be able to manage accounts in less than 2 hours	FR4
NFR3	usability	a manager should be able to manage inventory and catalogue in less than 2 hours	FR5
NFR4	usability	a manager should be able to manage orders GUI in less than 1 hour	FR6
NFR5	usability	a manager should be able to manage accounting GUI in less than 1 hour	FR7
NFR6	usability	a manager should be able to learn to update system in less than 10 minute	FR8
NFR7	efficency	a transaction manages at most 300 products	FR1
NFR8	efficency	a barcode and his information must be read in <= 200ms	FR2
NFR9	efficency	a fidelity card must be read in <= 200ms	FR3
NFR10	efficency	a user must be able to login in <= 10s	FR4.4
NFR11	efficency	a user must be able to logout in <= 3s	FR4.5
NFR12	efficency	operations on inventory must be done in <= 100ms	FR5
NFR13	efficency	the inventory and the catalogue must contains a range of 500 to 2000 products	FR5
NFR14	efficency	operations on orders table must be done in <= 100ms	FR6
NFR15	efficency	accounting must be computed in <= 1s	FR7

ID	Type (efficiency, reliability, ..)	Description	Refers to
NFR16	efficency	system update must be computed in <= 1 hour	FR8
NFR17	efficency	system update must be <= 50 MB	FR8
NFR18	Security	server stores salted hashes of passwords	FR4
NFR19	Security	cashier passwords must be 8 alphanumeric caracters long	FR4
NFR20	Security	manager passwords must be 16 alphanumeric caracters long	FR4
NFR21	reliability	operations on the inventory fails at most 1 time per year	FR5
NFR22	reliability	profits and outcomes errors must be <= 1 per year	FR7
NFR23	reliability	update errors must be <= 1 per year	FR8
DOM1	domain	currency is Euro	FR1

Use case diagram and use cases

Use case diagram
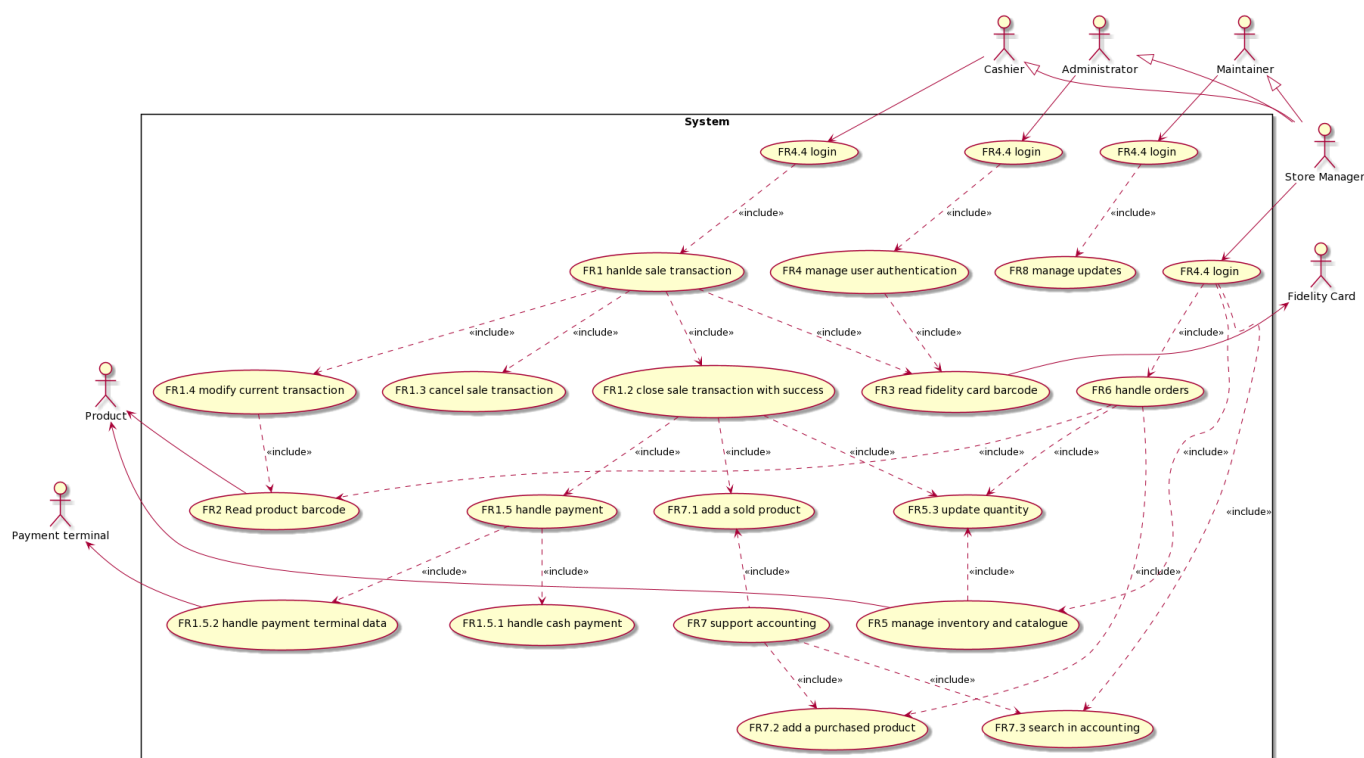
Manage a transaction, UC1

Actors Involved	Cashier, Product, Payment Card, Fidelity Card
Precondition	the cashier should be logged in the POS

Actors Involved	Cashier, Product, Payment Card, Fidelity Card
Post condition	the purchased products are added to the sold products table, the quantity of the products is updated, transaction concluded correctly
Nominal Scenario	the cashier scans products chosen by customer and closes current transaction
Variants	since the customer doesn't have enough credit on Payment Card, cashier needs to cancel current transaction

Scenario 1.1

Scenario 1.1	transaction with cash payment
Precondition	the cashier should be logged in the POS
Post condition	the purchased products are added to the sold products table, the quantity of the products is updated, transaction concluded correctly
Step#	Description
1	the cashier scan a product with the barcode reader
2	a new sale transaction is opened
3	a new list is created
4	the barcode reader retrive the name of the product from the catalogue
5	the barcode reader retrive the price of the product from the catalogue
6	the retrived information are added to the list and displayed it in the POS screen
7	steps 1 and 4 to 6 are repeated until all products are scanned
8	the POS computes the total amount of the list and displayed it in the POS screen
9	the chashier selects the cash payment method with the POS GUI
10	the cashier insert the amount of money gived by the customer with the GUI
11	the system evaluate the change and show it it on the POS screen
12	the transaction is closed with success
13	for each product the quantity in the inventory is updated, a new record is inserted in the sold products table with the current date and a unique id
14	the list is deleted

Scenario 1.2

Scenario 1.2	transaction with Payment Terminal
Precondition	the cashier should be logged in the POS , web services must be operative, credit card accepted by terminal (enough credit and pin digited correctly)
Post condition	the purchased products are added to the sold products table, the quantity of the products is updated, transaction concluded correctly
Step#	Description
1	the cashier scan a product with the barcode reader
2	a new sale transaction is opened
3	a new list is created
4	the barcode reader retrive the name of the product from the catalogue
5	the barcode reader retrive the price of the product from the catalogue
6	the retrived information are added to the list and displayed it in the POS screen
7	steps 1 and 4 to 6 are repeated until all products are scanned
8	the POS computes the total amount of the list and displays it in the POS screen
9	POS sends amount at payment terminal
10	the chashier selects the credit card payment method with the POS GUI
11	the system receives a positive reply from payment terminal
12	the transaction is closed with success

Scenario 1.3

Scenario 1.3	The cashier changes payment method from credit card to cash
Precondition	the cashier should be logged in the POS, web services must be operative
Post condition	the purchased products are added to the sold products table, the quantity of the products is updated, transaction concluded correctly
Step#	Description
1	the cashier scan a product with the barcode reader
2	a new sale transaction is opened
3	a new list is created
4	the barcode reader retrive the name of the product from the catalogue
5	the barcode reader retrive the price of the product from the catalogue
6	the retrived information are added to the list and displayed it in the POS screen

Scenario 1.3	The cashier changes payment method from credit card to cash
7	steps 1 and 4 to 6 are repeated until all products are scanned
8	the POS computes the total amount of the list and displayed it in the POS screen
9	the chashier selects the credit card payment method with the POS GUI
10	the payment is refused by the terminal because there is not enough money in the credit card
11	the cashier cancel payment card method with the POS GUI
12	the cashier selects cash payment method with the POS GUI
13	the cashier insert the amount of money gived by the customer with the GUI
14	the system evaluate the change and show it it on the POS screen
15	the transaction is closed with success
16	for each product the quantity in the inventory is updated, a new record is inserted in the sold products table with the current date and a unique id
17	the list is deleted

Scenario 1.4

Scenario 1.4	transaction with product inserted by mistake
Precondition	the cashier should be logged in the POS, a transaction should be opened, a product should be scanned by mistake
Post condition	the purchased products are added to the sold products table, the quantity of the products is updated, transaction concluded correctly
Step#	Description
1	the cashier realizes that he/she made a mistake
2	the cashier select the cancel product button from the POS GUI
3	the cashier scans again the product barcode
4	one occurence of the product is removed from the list
5	the cashier continues with the remaining products
6	the POS computes the total amount of the list and displayed it in the POS screen
7	the chashier selects the cash payment method with the POS GUI
8	the cashier insert the amount of money gived by the customer with the GUI
9	the system evaluate the change and show it it on the POS screen

Scenario 1.4	transaction with product inserted by mistake
10	the transaction is closed with success
11	for each product the quantity in the inventory is updated, a new record is inserted in the sold products table with the current date and a unique id
12	the list is deleted

Scenario 1.5

Scenario 1.5	transaction with fidelity card discount
Precondition	the cashier should be logged in the POS , web services must be operative, enough points on fidelity card
Post condition	the purchased products are added to the sold products table, the quantity of the products is updated, transaction concluded correctly
Step#	Description
1	the cashier scan a product with the barcode reader
2	a new sale transaction is opened
3	a new list is created
4	the barcode reader retrive the name of the product from the catalogue
5	the barcode reader retrive the price of the product from the catalogue
6	the retrived information are added to the list and displayed it in the POS screen
7	steps 1 and 4 to 6 are repeated until all products are scanned
8	the POS computes the total amount of the list and displayed it in the POS screen
9	the customer asks how many points are currently on the fidelity card
10	the chashier checks the points amount and the discount that can be applied
11	if discounts are possible, the chashier selects the fidelity card discount with the POS GUI
12	the points are deducted from the fidelity card
13	the chashier selects the payment method with the POS GUI
14	the payment is managed as in previous scenarios

Scenario 1.6 variant

Scenario 1.6	deleted transaction for not enough money
Precondition	the cashier should be logged in the POS, the list of scanned products is correct

Scenario 1.6	deleted transaction for not enough money
Post condition	the transaction is deleted, the inventory and the sold products table do not change

Step#	Description
1	the POS computes the total amount of the list and displays it in the POS screen
2	the chashier selcts the cash payment method with the POS GUI
3	the transaction is deleted because the customer doesn't have enough money
4	the list is deleted

Manage a new fidelity card, UC2

Actors Involved	Store Manager, Fidelity Card
Precondition	the store manager should be logged in the management system
Post condition	a new fidelity card is assigned to a customer
Nominal Scenario	the store manager collects customer data and gives him the card

Scenario 1.1

Scenario 1.1	new fidelity card for a customer
Precondition	the store manager already log in the system
Post condition	a new customer account is created, the customer recive a fidelity card

Step#	Description
1	the store manager create a new account
2	the customer data are inserted in the account
3	the store manager scans a brand new fidelity card with the barcode
4	the barcode is associated with the new accout
5	the customer recives the fidelity card

Manage product orders, UC3

Actors Involved	Store Manager
Precondition	the store manager should be logged in the management system
Post condition	products with small quantity have been reordered
Nominal Scenario	the store manager consults the list of products that are ending and places their order
Variants	The store Manager wants to cancel an order

Scenario 1.1

Scenario 1.1	the store manager wants to place an order
Precondition	the store manager should be log in the management system
Post conditon	A new order should be created for the supplier
Step#	Description
1	the store manager checks products quantity using the management system GUI
2	the store manager place an order using the management system GUI
3	the store manager repeats the step 1-2 untill all the finishing products have been ordered

Scenario 1.2

Scenario 1.1	the store manager wants consults an order status
Precondition	the store manager should be log in the management system
Post conditon	The manager should know the date he will receive his order
Step#	Description
1	the store manager search an order using the management system GUI
2	the store manager select among the results the order of his interest using the management System GUI
3	the store manage can have access to details of the order

Scenario 1.3

Scenario 1.1	the store manager wants to cancel an order
Precondition	the store manager should be log in the management system
Post conditon	An order should be remove from the orders' tables in the Database
Step#	Description
1	the store manager checks if an order is active using the management system GUI
2	the store manager delete an order using the management system GUI

Scenario 1.4

Scenario 1.4	the manager receives a product delivery from the supplier
Precondition	the store manager, should be log in the management system

Scenario 1.4	the manager receives a product delivery from the supplier
Post conditon	The Order relative to the products received must change his status to completed from the System order list
Step#	Description
1	The store manager read a product barcode using the barcode reader
2	the store Manager add the product in the Inventory using add quantity System GUI
3	the store manager repeats steps 1-2 untill all the products are registered in the Inventory
4	the store manager search the order he just received from supplier using the management system GUI
5	the store manager changes the status of the order to completed using the management system GUI

User Authentication, UC4

Actors Involved	Administrator, Store Manager, Cashier
Precondition	User knows his credentials
Post condition	User has access to the System and the associated functionalities
Nominal Scenario	User uses his credentials

Scenario 1.1

Scenario 1.1	Administrator logs in, add new user
Precondition	Admin already logged in with his credentials
Post condition	New profile is added into the system
Step#	Description
1	Admin inserts User's datas and associated credentials
2	Admin choses Users's priviledges
3	Admin adds new User

Accounting status, UC5

Actors Involved	Store Manager
Precondition	the tables of purchased and sold products contain up to date information, the Store Manager already logged in

Actors Involved	Store Manager
Post condition	the system shows to the Store Manager the requested information
Nominal Scenario	the Store Manager applies some filters, the requested information are displayed on the management system GUI
Variants	the filters applied don't retrive any information, an advice appears on the management system GUI

Scenario 1.1

Scenario 1.1	the Store Manager wants to know today income for a specific product
Precondition	Store Manager already logged in, the tables of sold products contains up to date information
Post condition	today's income for the selected product is displayed
Step#	Description
1	the Store Manager select from the GUI menu the accounting option
2	the search form appears
3	the Store Manager insert product name in the search field select the filter 'by date', insert today's date and press the search button
4	a list of possible product is displayed in a dropdown field of the form
5	the Store Manager select a product
6	the Store Manager select the filter to be applied in a dropdown filed of the form
7	the Store Manager insert today's date
8	the Store Manager select the income check box
9	the Store Manager press the search button
10	today's income is displayed in the system management GUI

Scenario 1.2 - variant

Scenario 1.2	the Store Manager wants to know today income for a specific product, the product is not being sold today
Precondition	Store Manager already logged in, the tables of sold products contains up to date information, the form search already completed

| Scenario 1.2	the Store Manager wants to know today income for a specific product, the product is not being sold today
Post condition	the system doesn't find valid informations and shows a warning advice
Step#	Description
1	the Store Manager press the search button
2	a warning advice appears on the system management GUI

System update, UC6

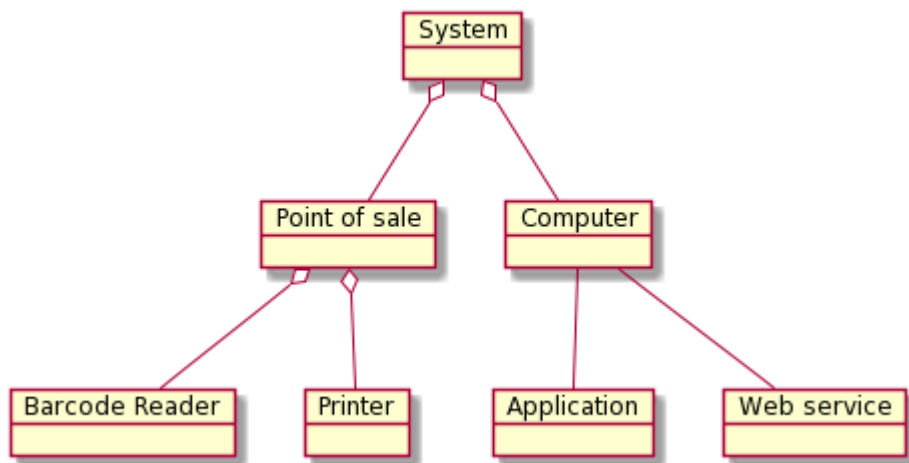| Actors Involved	Maintainer
Precondition	the system is not updated, the Maintainer is logged in the system, the system have an active internet connection
Post condition	the system is updated to the last version and ready to use in login page
Nominal Scenario	the Maintainer of the system checks for update

Scenario 1.1

Scenario 1.1	system update
Precondition	the Maintainer already log in the system, the internet conncection is working
Post condition	system is updated
Step#	Description
1	the Maintainer open the update window and clicks on check for update button
2	the system contact the company's server to download the update installer
3	the system install automatically the updtate and restart itself

Glossary
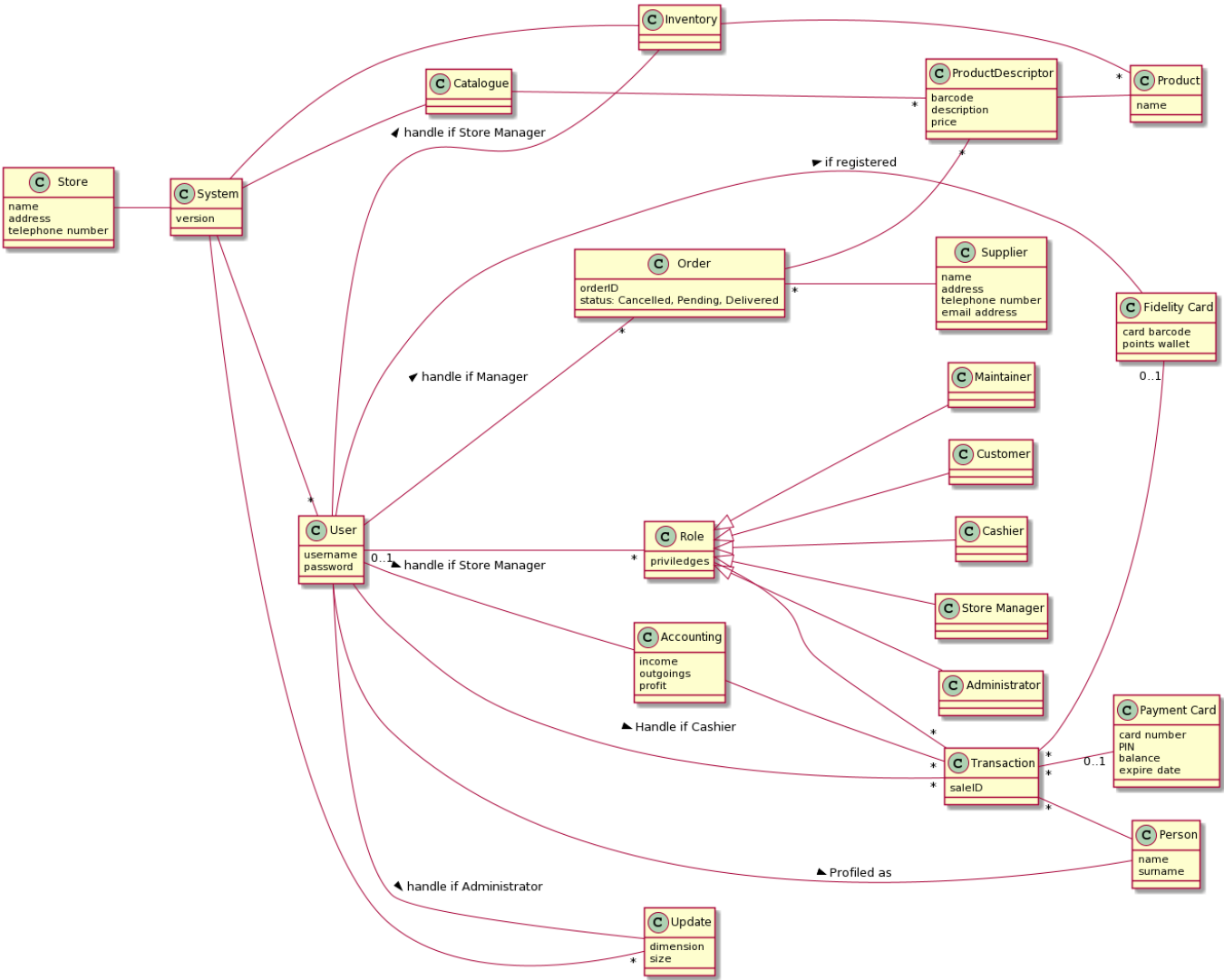
System Design

Deployment Diagram