Software Engineering- Assignment 1.1
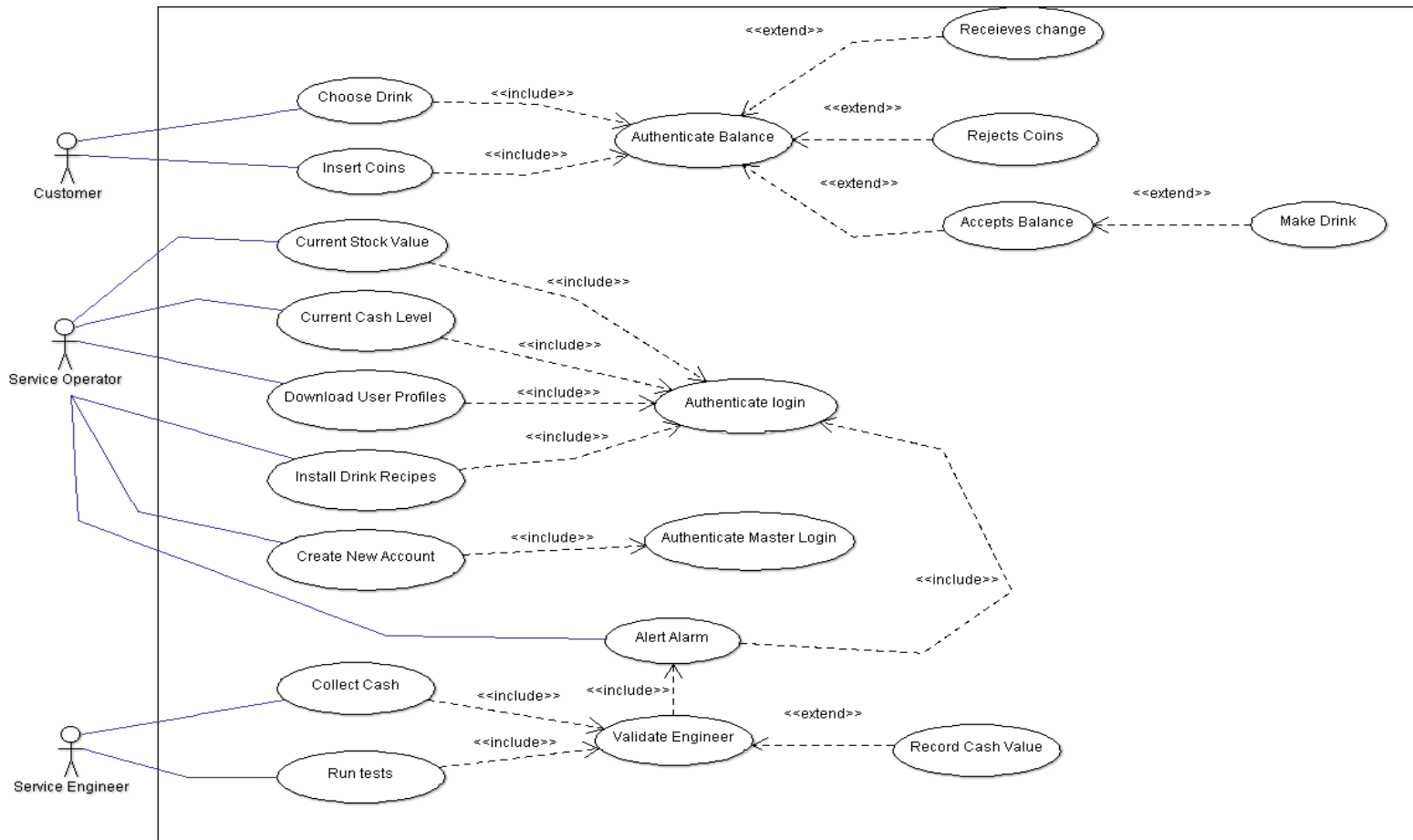## (Thomas Coupe, 201241037)

Use Case Diagram – Drinks Machine

Use Case Descriptions – Drinks Machine

ID	UC1
Name	Choose Drink
Description	Customer chooses drink from the machine
Pre-conditions	Drinks machine is in service
Event flow	1) User selects a drink from the drinks machine. 2) If drink is already selected exit use case
Post-conditions	Stock level and cash level updated.
Includes	"Use case 3 – Authenticate Balance"
Extensions	N/A
Triggers	User Requested to choose a drink from the machine.

ID	UC2
Name	Insert Coins
Description	User inserts coins into the machine for a drink
Pre-conditions	Drinks machine is in service
Event flow	1) User inserts coins into the machine 2) If user inserts a higher amount than required, include Use case 4 "Receives Change"
Post-conditions	Unknown coin value has been inserted into the machine
Includes	"Use case 3 – Authenticate Balance"
Extensions	N/A
Triggers	User inserts coins into the Drinks machine

ID	UC3
Name	Authenticate Balance
Description	User has inserted coins into the machine and the value is authenticated to see if the value inserted is enough.
Pre-conditions	User has inserted coins into the machine
Event flow	1) If balance is correct include Use case 6 "Accepts balance" 2) If balance is too much include Use Case 4 "Receives change" 3) If coins inserted are faulty include Use case 5 "Reject coins"
Post-conditions	Balance inserted has been authenticated
Includes	"Use case 1 – Choose Drink" "Use case 2 – Insert Coins"
Extensions	"Use case 4 – Receives Change" "Use case 5 – Rejects Coins" "Use case 6 – Accepts Balance"
Triggers	User has inserted coins and has selected a drink from the machine.

ID	UC4
Name	Receives Change
Description	If coin value inserted is too much the customer will receive change.
Pre-conditions	Coin balance has been authenticated
Event flow	1) User inserts coins into the machine

	2) If the coin value inserted is higher than required return change
Post-conditions	Coin balance is correct, customer received change
Includes	N/A
Extensions	"Use Case 3 - Authenticate Balance"
Triggers	User has inserted a higher coin value than required and change is returned.

ID	UC5
Name	Rejects Coins
Description	Machine rejects coins inserted by the user
Pre-conditions	Coin balance has been authenticated
Event flow	1) User inserts coins 2) If coins are faulty or wrong currency reject coins
Post-conditions	Coins rejected, either balance is not enough or coins are faulty / wrong currency.
Includes	N/A
Extensions	"Use Case 3 - Authenticate Balance"
Triggers	Customer of drinks machine may have inserted faulty coins or not enough coins to buy a drink.

ID	UC6
Name	Accepts Balance
Description	Coins inserted are valid and are enough to buy a drink. The machine accepts the balance
Pre-conditions	Coin balance has been authenticated
Event flow	1) User inserts coins into the machine 2) If coins are correct balance is accepted 3) Machine makes drink requested
Post-conditions	Coin balance has been accepted. Enough coin value for the machine to make a drink.
Includes	N/A
Extensions	"Use Case 3 - Authenticate Balance" "Use Case 7 – Makes Drink"
Triggers	User inserts coins into the machine to buy a drink.

ID	UC7
Name	Makes Drink

Description	The machine makes a drink once the balance has been accepted and a drink has been chosen.
Pre-conditions	Coin balance has been accepted
Event flow	1) Ensure coin balance is accepted 2) If coin balance is accepted proceed to make drink requested
Post-conditions	Drinks machine makes drink chosen by the user
Includes	N/A
Extensions	"Use Case 6 – Accepts Balance"
Triggers	Balance has been accepted by the drinks machine.

ID	UC8
Name	Current Stock value
Description	The service operator can see all levels of stock
Pre-conditions	Drinks machine is in service
Event flow	1) Service operator requests to check stock value 2) Include Use case 14 "Authenticate login" 3) If login is valid proceed
Post-conditions	Service operator requires authentication
Includes	"Use Case 14 – Authenticate Login"
Extensions	N/A
Triggers	Service operator requests to view the current stock value

ID	UC9
Name	Current Cash level
Description	Service operator can view the cash levels within the drinks machine
Pre-conditions	Drinks machine is in service
Event flow	1) Service operator requests to check current cash level 2) Include Use case 14 "Authenticate login" 3) If login is valid proceed
Post-conditions	Service operator requires authentication
Includes	"Use Case 14 – Authenticate Login"
Extensions	N/A

Triggers	Service operator requests to view the current cash levels in the machine

ID	UC10
Name	Download User profiles
Description	Service operator can download user profiles onto the computer system of the drinks machine.
Pre-conditions	Drinks machine is in service
Event flow	1) Service operator requests to download user profiles 2) Include Use case 14 "Authenticate login" 3) If login is valid proceed
Post-conditions	Service operator requires authentication
Includes	"Use Case 14 – Authenticate Login"
Extensions	N/A
Triggers	Service operator requests to download user profiles onto the drinks machine.

ID	UC11
Name	Install Drink recipes
Description	New drinks recipes can be downloaded by the service operator.
Pre-conditions	Drinks machine is in service
Event flow	1) Service operator requests to install new drink recipes 2) Include Use case 14 "Authenticate login" 3) If login is valid proceed
Post-conditions	Service operator requires authentication
Includes	"Use Case 14 – Authenticate Login"
Extensions	N/A
Triggers	Service operator requests to install new drinks recipes onto the drinks machine.

ID	UC12
Name	Create New account
Description	New accounts can be created on the drinks machine
Pre-conditions	Drinks machine is in service

Event flow	1) Service operator requests to create a new account on the machine 2) Include Use case 15 "Authenticate master login" 3) If login is valid proceed
Post-conditions	Service operators master login requires authentication
Includes	"Use Case 15 – Authenticate Master Login"
Extensions	N/A
Triggers	Service operator requests to create a new account on the drinks machine.

ID	UC13
Name	Alert Alarm
Description	Alarm is alerted to authenticate user login of the service engineer and can be alerted by the service operator.
Pre-conditions	Drinks machine is in service
Event flow	1) If Service operator alerted alarm authenticate login. 2) If Service engineer attempts to perform a task alert alarm 3) Authenticate service engineer's login.
Post-conditions	Service operator requires authentication
Includes	"Use Case 14 – Authenticate Login"
Extensions	N/A
Triggers	Service operator either alerted alarm or service engineers login requires authentication

ID	UC14
Name	Authenticate Login
Description	Login is authenticated to ensure only the service operator can access details about the drinks machine
Pre-conditions	Service operator attempts to perform a task on the drinks machine
Event flow	1) Authenticate login 2) If login is incorrect exit system 3) If login is correct proceed
Post-conditions	Service operators login is authenticated
Includes	"Use Case 8 – Current stock value"

	"Use Case 9 – Current Cash level" "Use Case 10 – Download user profiles" "Use Case 11 – Install Drinks recipes" "Use Case 13 – Alert alarm"
Extensions	N/A
Triggers	Service operator has attempted to perform a task on the machine and requires authentication.

ID	UC15
Name	Authenticate Master login
Description	Master login must be authenticated to create a new account on the drinks machine
Pre-conditions	Service operator attempts to create new accounts on the drinks machine
Event flow	1) Service operator attempts to create a new account 2) Authenticate master login 3) If login is incorrect exit system 4) If login is authenticated allow permission.
Post-conditions	Master login is authenticated.
Includes	"Use case 12 – Create New account"
Extensions	N/A
Triggers	Service operator has requested to create a new account on the drinks machine.

ID	UC16
Name	Collect Cash
Description	Service engineer can collect the cash from the machine
Pre-conditions	Drinks machine in service.
Event flow	1) Service engineer attempts to collect cash 2) Validate engineer Include Use case 18 3) Alert alarm 4) Authenticate login
Post-conditions	Service engineer is validated.
Includes	"Use Case 18 – Validate Engineer"
Extensions	N/A
Triggers	Service engineer has requested to collect cash from the drinks machine

ID	UC17
Name	Run Tests
Description	Service engineer can run tests on the drinks machine to ensure its functioning correctly
Pre-conditions	Drinks machine in service.
Event flow	1) Service engineer attempts to run tests 2) Validate engineer 3) Alert alarm 4) Authenticate login
Post-conditions	Service Engineer is validated.
Includes	"Use Case 18 – Validate Engineer"
Extensions	N/A
Triggers	Service engineer has requested to run tests on the drinks machine.

ID	UC18
Name	Validate Engineer
Description	Validating that it is the service engineer trying to perform tasks on the machine such as collecting cash.
Pre-conditions	Service engineer attempts to perform tasks on the machine
Event flow	1) Authenticate engineer 2) If engineer is authentic proceed 3) If engineer isn't valid exit system
Post-conditions	Service operator is notified and service engineer is validated.
Includes	"Use Case 13 – Alert Alarm" "Use Case 16 – Collect Cash" "Use Case 17 – Run Tests"
Extensions	N/A
Triggers	Service engineer has requested to perform a task on the machine and needs to be authenticated.

ID	UC19
Name	Record Cash value
Description	Service engineer can record the current cash levels within the drinks machine once validated.
Pre-conditions	Service engineer has been authenticated
Event flow	1) Ensure engineer is valid 2) If engineer is valid allow to record cash value

	3) If engineer isn't valid exit system
Post-conditions	Cash values of the drinks machine have been recorded.
Includes	N/A
Extensions	"Use Case 18 – Validate Engineer"
Triggers	Service engineer records current cash value of the machine.

Drinks machine – Non-functional requirements

Security

When a user tries to login as either the service operator or the service engineer, if they input the wrong login details 3 times in a row the system must alert the service operator to authenticate the user. The service operator is sent an automated email through the internet connection of the machine to verify if the login is valid or if the login is incorrect. If the login attempt is authentic allow the user another 3 attempts to log in. However, if the login attempt is not valid lock out the user from logging into the machine.

Performance

When the user of the drinks machine selects a drink from the machine, the machine should have a response time of 0.1 seconds. This means that the performance of the drinks machine is good enough for the machine to be used effectively by the user. If the system has a slow response time it makes navigating and using the system much harder for the user. If the response time of the machine is much longer than 0.1 seconds the service operator must be alerted to ensure that the machine runs as efficiently as possible.

Usability

The user interface of the drinks machine must be easy to navigate. For example, if the user accidently selects the wrong drink, the system must be able to allow the user to navigate easily through the interface such as going back to a previous point in the system. A good user interface should be easy to understand and easy to adapt to. The service operator or service engineer should test the interface and ensure that it is easy to navigate and use. This is a very important feature of the drinks machine as it is how the user interacts with the system.

Capacity

The drinks machine must have the highest capacity possible for storing the ingredients needed in order to make the drinks. With the system having a higher capacity it requires the service engineer to fill up the machine much less often. This is also very important as it means the users of the drinks machine can get more drinks out of the machine before it needs to be filled up again. The machine must keep a constant record of the current stock

levels, if the stock levels are getting low the service engineer must be notified to fill up the machine with ingredients.

Environmental

The Drinks machine must try to limit its electricity consumption to ensure electricity isn't being wasted. For example, any background tasks such as stock level monitoring or water heating must be limited to reduce the electricity usage. When the service operator uses the machine he must complete tests to ensure that there are no background processes running that don't need to be. For example, if there was a background process monitoring connectivity to the internet the process should be terminated until the drinks machine is in use by the user. Taking precautions such as this reduces the power consumption of the drinks machine while it's not being used, this saves money and is better for the environment.