SENG 426

Software Quality Engineering

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Requirements Specification

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Task I: User Stories of Features

The roles that exist are shown below from lowest to highest privilege:

- Site Visitor: A user that can only view publicly available information,and register to become a Neptune Bank customer.
- Customer: A user that add a payee account, transfer money, hold different accounts (Loan, savings, credit cards, and checking), check the transactions related to their accounts, check their account statements within a date range, sort their transactions, can debit/credit money from/into his/her accounts and change their password and non-sensitive details.
- Staff: lookup customers' accounts and perform transactions on their behalf.
- Manger: Can do anything a staff member can do, approve loans, and can post/update news/notices on the main website.
- Admin: Can do anything a staff member or a manager can do, can add/edit/delete customer, staff, and manager accounts, and view the log of the main operations performed by staff/manager/admin.

  This does mean that many staff use cases are relevant to a manager, and both staff and manager use cases are relevant to an admin. To avoid duplication many use cases are only added once but all relevant users are identified.

Site Visitor

As a site visitor I want to create an account so that I have access to customer services and become a customer of Neptune bank.
Feature: Making an account

Scenario: User creates a new account
Given I am not a user
And I have navigated to the home page
When I enter my email address
And enter my first name
And enter my last name
And create a password with more than four characters
And confirm my details
Then I am a customer with a new account
And have access to customer features

Scenario: User creates a new account
Given I am not a user
And I have navigated to the home page

When I make a new account
And do not enter first or last name or a secure password
Then the input box(es) should be red

As a site visitor or a customer I want to view bank notices for certain branches or for the bank itself so that I am aware of changes and promotions that might entice me.
Feature: View bank notices

Scenario: View notices
Given I am a site visitor or customer user
When I view a notice
Then the news/notice is displayed
And I can scroll between news/notices to view past notices

As a site visitor I want to learn about Neptune bank because I want to decide if I should become a customer.
Feature: Learn more about the bank

Scenario: Find out about us
Given I am a site visitor or customer user
When I have navigated to the about us page
Then the banks services are displayed
And current branches are displayed
And the history of the bank is also described

As a site visitor I want to obtain the names and contact information for Neptune bank staff so that I can inquire about any questions that might arise before I decide to become or not become a customer.
Feature: Contact us

Scenario: Find bank contact information
Given I am a site visitor or customer user
When I have navigated to the contact us page
Then the bank executives are displayed
And their contact information is given
And their email address is given

Customer

As a customer I want to upload ID proof in the format of a PDF so that a manager can verify my account and approve its creation in order for me to use it.

Feature: Upload ID Proof

Scenario: Existing customer needs to upload ID proof
Given I am an existing customer
When I go to upload ID proof
And upload a valid file
Then I should be notified that an ID proof has been added to my account

As a customer add a payee so that I can easily transfer to the payee and identify each payee with a name and a description.
Feature: Adding payee

Scenario: Existing customer adds another existing customer as payee
Given I am an existing customer
And payee being added is an existing customer
When I go to create a payee
And enter an existing customer's information correctly
Then I should be notified with a success message of an added payee
And I should be redirected to payee list
And payee should appear in payee list

Scenario: Existing customer adds non-existent customer as payee
Given I am an existing customer
And payee being added is not an existing customer
When I go to create a payee
And enter a payee's information
Then I should be notified with an error message to register customer in question

As a customer I want to transfer money to another person so that I can pay them the money they are owed.
Feature: Transfer amount to beneficiary added by customer (e-transfer)

Scenario: Customer with a balance of $500 transfers $250 to payee
Given I am an existing customer with an active account
And payee being paid is an existing customer with an active account
When I go to transfer money to payee
And enter a transfer amount of $250
And select the payee from my list of payee
And select account that contains a balance of $500
Then I should be notified with a successful transaction message

And I should be redirected to transactions page
And transaction with all transaction information should appear in the list

As a customer I want a savings account and a credit account so that I can earn more rewards using my credit account but still keep all my accounts at one bank.
Feature: Customer can have different accounts (Loan, savings, credit cards, and checking)

Scenario: Existing customer requests for savings, checking, credit, and loan accounts
Given I am an existing customer
When I I request for multiple different account
And enter valid account information
Then I should be notified with a success message of an added account
And I should be redirected to accounts list
And added account should appear in list with unique account ID

As a customer I want to view an account statement because I want a monthly summary of the transactions that occurred that month.
Feature: Customers can check their account statements within a date range

Scenario: Existing customer checks their accounts statement within a date range
Given I am an existing customer with at least one active account
When I request to filter my account statements by date
And choose a range of valid dates
Then the account statements should be correctly filtered between chosen dates

As a customer I want to view my transactions based on amount, date, or transaction type so that I can keep track of the purchases I have made and come back to my history if I need to verify a transaction.
Feature: Customers can sort their transactions based on certain variables

Scenario: Existing customer navigates to transactions tab to check transactions
Given I am an existing customer with one or more transactions
When I request to filter my transactions statements by available variables
Then the list of transactions becomes sorted according to that variable

As a customer I want to credit or use the balance I currently have in my account so that I can make purchases using my money.
Feature: Customers debit/credit money to/from their accounts

Scenario: Existing customer credits $10 from their savings to their credit
Given I am an existing customer with an active saving account
And I have an active credit account
And I have at least $10 in my savings account
When I transfer the amount to the specified account ID from savings
Then I am informed of a successful transaction
And my account balances are updated successfully
And the transaction appear in my transaction history correctly

As a customer I want to change the password I use to login so that I can maintain my accounts security or because I forgot my password.
Feature: Customer can change their password

Scenario: Existing customer navigates to change their password under account tab
Given I am an existing customer with an account
When I enter my existing password and new password correctly
And I enter a matching new password confirmation
Then I am informed of a successful password change
And I can sign in with my new password
And my old password does not work for my account anymore

Scenario: Existing customer forgot their password
Given I am an existing customer with an account
When I and at the login page
And forgot my password
Then I am able to change my password by sending a password reset link to my email address
And I can sign in with my new password
And my old password does not work for my account anymore

As a customer I want to change my email address on file with the bank because I have changed the address I use for my emails.
Feature: Customer can change their email address

Scenario: Existing customer navigates to change their email under account tab
Given I am an existing customer with an account
When I enter my updated email address correctly
And the entered email is valid
Then I am notified of a successful setting change
And I can sign in with my updated email

And my old email does not work for my account anymore

Staff

As an admin, manager, or staff I want to search for my customer to change their details because their personal information is in need of updating to ensure we can contact them in the correct way.
Feature: Update customer details

Scenario: customer wants to change account details at the branch
Given I am an manger, admin, or staff
When I locate the clients account
And edit the clients details
Then change any details visible
And am notified of an updated customer

As an admin, manager, or staff I want to search for my customer and view their details in order to provide them information to answer their questions or ensure information is up to date.
Feature: View customer details

Scenario: customer wants to know account details at the branch
Given I am a manager, admin, or staff
When I locate the clients account
And view the clients details
Then the account is displayed in full screen
And I can navigate back to the customers or edit the customer

As an admin, manager, or staff I want to search for my customer and delete/close their accounts because they may want to move banks or are no longer in need of our banking services.
Feature: Delete customer

Scenario: customer wants to close their account at the branch
Given I am a manager, admin, or staff
When I locate the clients account
And delete the customer
Then I must verify the deletion
And am notified of a deleted user

As an admin, manager, or staff I want to search for my customer by first name, last name, phone number, or email address so that we can perform transactions on their behalf and update their account information.
Feature: Search for customer

Scenario: customer wants to edit their customer details at the branch
Given I am a manager, admin, or staff
When I locate the customer by searching their details
Then I am presented with possibilities

As an admin, manager, or staff I want to search for my customers account to change it's details because the account may no longer serve their needs as well as another account could or their balance must be changed to reflect a transaction.
Feature: Update account details

Scenario: customer wants to deposit amount at the branch
Given I am an manger, admin, or staff
When I locate the clients account
Then the account balance can be modified
And I am notified of the updated account

Scenario: customer wants to change account type at the branch
Given I am an manger, admin, or staff
When I locate the clients account
Then the account details can be modified
And I am notified of the updated account

As an admin, manager, or staff I want to search for my customers' accounts and view their account details in order to provide them information to answer their questions and serve their banking needs.
Feature: View account details

Scenario: customer wants to know account details at the branch
Given I am a manager, admin, or staff
When I locate the clients account
And view the clients details
Then the account is displayed in full screen
And I can navigate back to the accounts or edit the account

As an admin, manager, or staff I want to search for my customer and delete/close their account because they may want to move their account to another bank or the account is no longer relevant to them.
Feature: Delete account

Scenario: customer wants to close their account at the branch
Given I am a manager, admin, or staff
When I locate the clients account
And delete the account
Then I must verify the deletion
And am notified of a deleted account

As an admin, manager, or staff I want to search for my customers' accounts by first name, last name, phone number, email address, or account number so that we can perform transactions on their behalf and update their account information.
Feature: Search for account

Scenario: customer wants to deposit into their account at the branch
Given I am a manager, admin, or staff
When I locate the clients account by searching their details
Then I am presented with possibilities

Manager

As an admin or a manager I want to provide customers and the public information regarding certain branches, promotions, and changes because I want them to be informed and have access to important notices.
Feature: Can post/update news/notices on the main website

Scenario: Manager creates a new news/notice on the main website
Given I am a manager or admin user
When I create a new notice
And I enter the title
And the date
And the content
Then I am notified of a new news is created
And I can see the new news/notice in order of creation

Scenario: Manager edits a news/notice on the main website
Given I am a manager or admin user
When I edit a notice

And I don't make the title blank
And I don't make the date blank
And I don't make the content blank
Then I am notified of a updated news
And I can see the news/notice in order of creation

Scenario: Manager deletes a news/notice on the main website
Given I am a manager or admin user
When I delete a notice
And I confirm the deletion
Then I am notified of a deleted news
And I can see the remaining news/notice

Scenario: Manager views a news/notice on the main website
Given I am a manager or admin user
When I view a notice
Then the news/notice is displayed in full screen
And the person who posted it
And the exact time/date it was posted should be displayed
And I can navigate back to the board or edit the news/notice

As an admin or a manager I want to approve a request so that my customer has access to their approved account and balance.
Feature: Approval of loans

Scenario: Approves loan/account
Given I am an manager or admin user
When I locate the approval request
And select activate
Then I should be notified with a success message
And the customer should be notified that their account was approved

As an admin or a manager I want to change the request or decline a customer's request so that I can approve an amount that matches what we are authorized to provide.
Feature: Edit/decline a request for a loan/account

Scenario: Edit loan/account request
Given I am an manager or admin user
When I locate the approval request
And modify any details

And save the changes
Then I should be notified with a account updated message
And the customer should be notified that their account request was modified

Scenario: Decline loan/account request
Given I am an manager or admin user
When I locate the approval request
And delete the request
Then I must verify the request deletion
And be notified of the account deletion
And the customer should be notified that their account request was declined

Admin

As an admin I want to add/edit/delete user accounts so that I can ensure non-authenticated users do not have access and authenticated users do have the correct access.
Feature: Admin user add/edit/delete capabilities.

Scenario: Add accounts
Given I am an admin user
When I add a new account
And provide the login, first name, last name, email, and authority for the new account.
Then I should be notified with a success message

Scenario: Add account with error
Given i am an admin user
When I add a new account
But fail to provide information into the fields provided.
Then I should not be able to create a new user and the incorrect field glows red.

Scenario: Edit accounts
Given I am an admin user
When I edit an account
Then I should be notified with a success message when done

Scenario: Edit account with error
Given i am an admin user
When I edit an account
But fail to provide or remove information from a field.
Then I should not be able to save the edited information and the incorrect field glows

red.

Scenario: delete accounts
Given I am an admin user
When I delete an account
Then I should be notified with a success message when done

As an admin I want to view operations conducted on my site to maintain the security of my users and that my employees are conducting the right actions.
Feature: View operation log.

Scenario: View operation log
Given I am an admin user
When navigate to the operations page
Then I can see a log of all the operations that occurred
And the performing user is displayed
And the timestamp is displayed

Currency Converter

As a customer I want to convert from one currency to another currency so I can make transactions using other currency.
Feature: Converting currency using the calculator

Scenario: Converting from currency A to currency B
Given I am a customer and I am on the foriegn exchange calculator page
When I provide currency A
And the amount of currency A
And specify currency B
Then I am shown the correct conversion to currency B at the current exchange rate

Scenario: Inputting negative values
Given I am a customer and I am on the foriegn exchange calculator page
When I convert currency A to currency B with a non-negative value
When I provide currency A
And a negative amount of currency A
And specify currency B
Then I should not be shown any conversion and the input field should glow red

As a customer I want to view the current exchange rate between forigen currencies and CAD so that I am aware of the rate prior to using the converter.

Feature: View current exchange rates

Scenario: View current exchange rates
Given I am a customer
When I am on the foriegn exchange calculator
Then I am shown the current conversion rate between foreign currencies and CAD in a table

New Feature: Cryptocurrency Tracker

As a customer I want to view the current value of certain cryptocurrencies so that I can identify what currencies are worth the most.
Feature: Viewing the value of cryptocurrency

Scenario: Customer wants to navigate to the cryptocurrency page
Given I am a customer
When I press the crypto currency button on the nav bar
Then I should be navigated to the crypto currency page

Scenario: Customer wants the current cryptocurrency value
Given I am a customer on the cryptocurrency page
When I select a cryptocurrency to view
Then I should be shown the correct value of the cryptocurrency in CAD

As a customer I want to view the trend value of certain cryptocurrencies to better determine if I should buy it.
Feature: Viewing the trend of the cryptocurrency value

Scenario: User wants the view the cryptocurrency trend
Given I am a customer on the cryptocurrency page
When I select a cryptocurrency to view
And enter the date range within the last 60 days
Then a graph showing the correct date range should be displayed
And the graph will display the value trend of the respective cryptocurrency

As a customer I want to update the current value of a cryptocurrency so that I can have real time information if I decide to purchase the cryptocurrency.
Feature: Updating displayed cryptocurrency value

Scenario: User wants to refresh the displayed values on the crypto page
Given I am a customer on the cryptocurrency page

When I select a cryptocurrency to view
And I click the refresh button
Then the current cryptocurrency value is updated on the page
And “last updated” icon is refreshed to display the current time

Task II - Comparison of Story Points and Hours For Task Estimation

Hour Estimation:

Using hours, or more specifically man-hours, to estimate tasks is the most widely used method for measuring team work. It is defined simply as the amount of work that can be completed by one person within an hour. The quality or accuracy of this man hour is defined as;

$$Accuracy \; = \; Actual\ Time\ Spent \ / \ Estimated\ Time$$

Where a man-hour is considered to be of high quality or very accurate when the time spent on the task is equal to that of the actual time spent by the individual working on the task.

The big pro to using man-hours to estimate how long it will take to complete a task is that it is very easy to understand, and the metrics easy to calculate.

While there is a lot of upside using man-hours to estimate tasks also has its problems. The main con is that for more complex tasks it is not obvious how much time it will be estimated to complete. This is further complicated by the fact that different developers have different levels of experience and the varying experience will cause completion time to differ. Lastly people are often very optimistic about how long it will take to complete tasks, this is true even outside of software development and expands to our individual lives. Individuals will usually think of the best-case scenario as the typical time it will take to complete the task, forgoing any roadblocks or difficulties they might encounter along the way.

Story Points Estimation:

Story points is another popular method for task estimation. Unlike man-hours this method uses what are called “story points” (a unit of measure) to estimate the overall effort to complete a task. These story points are assigned from 3 metrics, work complexity, risk/uncertainty, and the amount of work needed to complete the task. These story points are then assigned such that work can be better broken down into smaller pieces, the goal of this is to reduce the amount of uncertainty that surrounds the task. Lastly a part of story point estimation is a velocity metric that measures efficiency which is calculated by the average number of points completed per time period.

Unlike man-hours this task estimation method only has one big drawback. And that is people mistakenly use story points as a way of measuring productivity, instead of an estimation for tasks.

Story points have a couple of pros that are important to mention. Unlike man-hours, story points are beneficial because there is no correlation between the skills and experience of the individual doing the estimation. Story points are also flexible, since velocity is tracked (also a big plus) if velocity were to change there is no need for re-estimation of the tasks. Lastly a big benefit to using story points is that this task estimation is done on a high-level, this is very useful for more complex tasks.

Task III - Chosen Estimation Method

We will choose man-hours as our method of task estimation. We choose this method because of its simplicity and ease of use. As a reminder the man-hours task estimation is defined simply as the amount of work that can be completed by one person within an hour. The quality or accuracy of this man hour is defined as;

$$Accuracy = Actual\ Time\ Spent\ /\ Estimated\ Time$$

Task IV - Backlog Building

Title	**Type**	**Priority**	**Estimate**
Implement cryptocurrency refresh feature	Feature	High	4 hours
Calculate the currency conversion between any pair of main currencies using CAD as intermediary	Feature	High	8 hours
Calculate the currency conversion between a main currency and CAD	Feature	High	8 hours
Implement cryptocurrency page	Feature	High	8 hours
View the Current Buy/Sell exchange rates between foreign currencies and CAD as	Feature	High	8 hours

a table			
No input validation on fields while requesting a new customer account	Bug	High	1 hour
Transactions list date range filter functions incorrectly	Bug	High	8 hours
Admin accounts cannot post to news/updates	Bug/Feature	High	8 hours
Customer cannot access account statements	Bug/Feature	High	8 hours
Admin Accounts are logged out after activating a users account	Bug	Medium	4 hours
Cannot Delete original users	Bug	Medium	4 hours
Forgot Password Email does not send to email address entered	Bug	Medium	2 hours
Unable to view who posted on the news/updates page	Bug/Feature	Medium	8 hours
Admin accounts are unable to edit posts in news/updates	Bug/Feature	Medium	8 hours
Admin Accounts unable to delete posts in news/updates page	Bug/Feature	Medium	2
Password Strength Indicator is visible while password field is	Bug	Low	2 hours

blank			
Email ID of a Payee does not need to be in Email Format	Bug	Low	2 hours
“End date” can be before “start date” when sorting by date in Transactions	Bug	Low	4 hours
Navigating back from Document Upload results in authorization error	Bug	Low	8 hours
Username Error Message displays improperly on First Click on Hyperlinks on Sign in Modal	Bug	Low	8 hours
Deleting an Account Approval Request is unsuccessful/creates poor UX	Bug	Low	4 hours
Cannot sort Transactions by Transaction ID	Bug	Low	4 hours
Cannot sort Branches by Branch ID in “Our Branches Tab”	Bug	Low	4 hours
Cannot sort Accounts by Branch	Bug	Low	4 hours
Sorting by Account ID in “Accounts” tab results in error	Bug	Low	2 hours
After an Unsuccessful Login, closing the modal or going to a	Bug	Low	2 hours

separate tab and reopening, the error message remains visible			
Navigating back from Document Upload results in authorization error	Bug	Low	4 hours
Cannot sort Customer Details list by User ID	Bug/Feature	Low	2 hours
Poor file Validation on ID proof upload	Bug/Feature	Low	4 hours
Users cannot change their username	Bug/Feature	Low	2 hours
Implement cryptocurrency data display	Feature	Low	8 hours