

## Sprint 6 – Functional and Product Testing

### 1. Modeling and performing test cases

#### 1. Login test case

##### **Test case TC001: Login – Successful Login**

Description: Verify that a user can log in with valid credentials

Languages: English, Finnish, Japanese, Korean, Arabic, Spanish

Test Steps:

1. Choose language
2. Navigate to login page
3. Enter valid username and password
4. Click “login” button

Expected Result: User is logged in and homepage is displayed with selected language.

Actual Result: User is logged in and homepage is displayed with selected language.

✓ Test passed in all languages!

##### **Test case TC002: Login - Invalid Login**

Description: Verify that a user can't log in with incorrect credentials

Languages: English, Finnish, Japanese, Korean, Arabic, Spanish

Test Steps:

1. Choose language
2. Navigate to login page
3. Enter incorrect username and/or password
4. Click “login” button

Expected Result: Error message for invalid credentials

Actual Result: Error message for invalid credentials

✓ Tests passed in all languages!

## 2. Registering test case

### **Test case TC003: Register – Successful Register**

Description: Verify that a user can register with valid credentials

Languages: English, Finnish, Japanese, Korean, Arabic, Spanish

Test Steps:

1. Choose language
2. Navigate to registering page
3. Enter valid username, password, email, address, phone number, first name, and last name
4. Click “register” button

Expected Result: User registered successfully, bankaccount is created for user and navigated to main page.

Actual Result: User registered successfully, bankaccount is created for user and navigated to main page.

✓ Tests passed in all languages!

### **Test case TC004: Register – Unsuccessful Register**

Description: Verify that a user's attempt to register with already existing credential fails

Languages: English, Finnish, Japanese, Korean, Arabic, Spanish

Test Steps:

1. Choose language
2. Navigate to registering page
3. Enter already existing username
4. Enter valid password, email, address, phone number, first name, and last name
5. Click “register” button

Expected Result: "Username already exists."

Actual Result: "Username already exists."

### 3. Account balance & fund transfer test case

#### **Test case TC005: Check account balance**

Description: Verify that a user can view their account balance

Languages: English, Finnish, Japanese, Korean, Arabic, Spanish

Test Steps:

1. Choose language
2. Log in and navigate to “Main” page to view balance

Expected Result: Correct balance will be displayed to the user

Actual Result: Correct balance is displayed to the user

✓ Tests passed in all languages

#### **Test case TC006: Fund Transfer – Successful Transfer**

Description: Verify that a user can transfer funds to another account

Languages: English, Finnish, Japanese, Korean, Arabic, Spanish

**Test Steps:**

1. Choose language
2. Log in and navigate to “Main” page
3. Click on “New Payment”
4. Enter the transfer details and submit

Expected Result: Success message is displayed, transaction registered to history, notification will be generated, account balance will be refreshed.

Actual Result: Success message is displayed, transaction registered to history, notification will be generated, account balance will be refreshed.

✓ Tests passed in all languages!

**Test case TC007: Fund Transfer – Transfer failed**

Description: Verify that a fund transfer fails if the account has insufficient funds.

Languages: English, Finnish, Japanese, Korean, Arabic, Spanish

**Test Steps:**

1. Choose language
2. Log in and navigate to “Main” page
3. Click on “New Payment”
4. Enter the transaction details including a bigger amount than the current balance and submit.

Expected Result: Error message is displayed and pop-up window closes.

Actual Result: Error message is displayed and pop-up window closes.

✓ Tests passed in all languages!

#### 4. Notification test case

**Test case TC008: Delete notification**

Description: Verify that a user can delete a notification successfully

Languages: English, Finnish, Japanese, Korean, Arabic, Spanish

Test Steps:

1. Choose language
2. Log in/register
3. Open notification expander
4. Click on “Delete” button

Expected Result: Notification deleted successfully.

Actual Result: Notification deleted successfully.

✓ Tests passed in all languages

#### 5. Profile test case

**Test case TC009: Update User Profile information**

Description: Verify that a user can update their profile information

Languages: English, Finnish, Japanese, Korean, Arabic, Spanish

Test Steps:

1. Choose language
2. Log in and navigate to “Profile” page
3. Scroll down and click on "update" button
4. Update information and save changes

Expected Result: Profile information is updated.

Actual Result: Profile information is updated.

✓ Tests passed in all languages!

## 6. Logout from Account

### **Test case TC010: Logout**

Description: Verify that a user can log out from their account

Languages: English, Finnish, Japanese, Korean, Arabic, Spanish

Test Steps:

1. Choose language
2. Log in.
2. Click the “Logout” button on the navigation bar.

Expected Result: User is logged out and redirected to the login page and cannot access other pages anymore.

Actual Result: User is logged out and redirected to the login page and cannot access other pages anymore.

✓ Tests passed in all languages!


## 2. Product testing and error tracking:

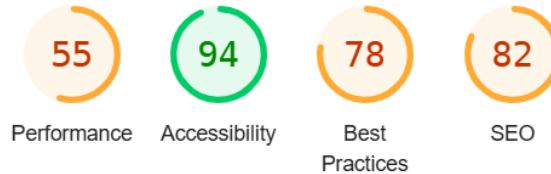
### 1. Data integrity checks and error handling in localized versions:


- Every part of the MVC-model structure implementation of the application has been successfully tested with JUnit tests.
- Most of the testing was done in earlier sprints, but due to functional changes, some of them had to be rewritten.
- Code coverage will be provided in the final report.

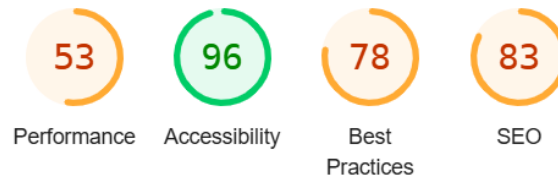
- JUnit tests have been created for every language bundle, and all of them passed successfully.
- During manual functional testing, we encountered problems with localized error messages. Issues were solved by creating new messages in language bundles and enhancing error handling across the application.
- In addition, functional testing also revealed other issues, such as clicking log out button, leading to “Malformed jwt exception”.


## 2. UI accessibility and performance through lighthouse:

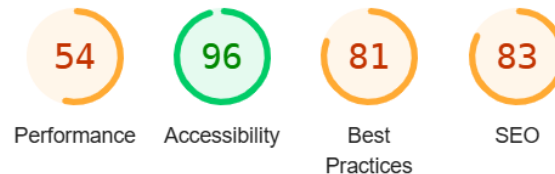
 <http://localhost:8080/profile>




 <http://localhost:8080/main>



 <http://localhost:8080/register>










 <http://localhost:8080/login>



### 3. Test report:

- Functional testing success rate in all localized languages: 100%
- UI lighthouse report average:
  - Performance: 54%
  - Accessibility: 94,75%
  - Best practices: 79,5%
  - SEO: 80,75%
- JUnit tests code coverage:

Element ^	Class, %	Method, %	Line, %	Branch, %
✓  all	53% (8/15)	33% (24/72)	16% (112/669)	33% (28/83)
>  com.example.easybankproject.config	100% (1/1)	75% (3/4)	63% (7/11)	100% (0/0)
>  com.example.easybankproject.controllers	100% (3/3)	100% (8/8)	97% (39/40)	83% (10/12)
>  com.example.easybankproject.models	33% (1/3)	100% (1/1)	100% (1/1)	100% (0/0)
>  com.example.easybankproject.services	100% (2/2)	100% (7/7)	100% (52/52)	87% (14/16)
>  com.example.easybankproject.ui	0% (0/5)	0% (0/47)	0% (0/552)	0% (0/51)
>  com.example.easybankproject.utils	100% (1/1)	100% (5/5)	100% (13/13)	100% (4/4)

#### List of errors:

#### 1.Notification grid localization:

- Notification grid titles are not localized correctly in any language.

#### 2.Error handling in transactions:

- “Insufficient funds”- error message is not localized.
- “Sender or receiver not found” - error message is not localized.

#### 3.Log out error:



- “Malformed jwt exception” - error occurred, when user logged out.

#### 4. Error message issues and lack of localization:

- “Error no body” - message displayed, when trying to register with already existing username. Message isn’t localized in any language either.
- “Please fill in all fields” - message isn’t localized, when trying to register.
- “Error no body” - message displayed, when trying to log in with invalid credentials or if all fields are not filled. Messages aren’t localized in any language either.

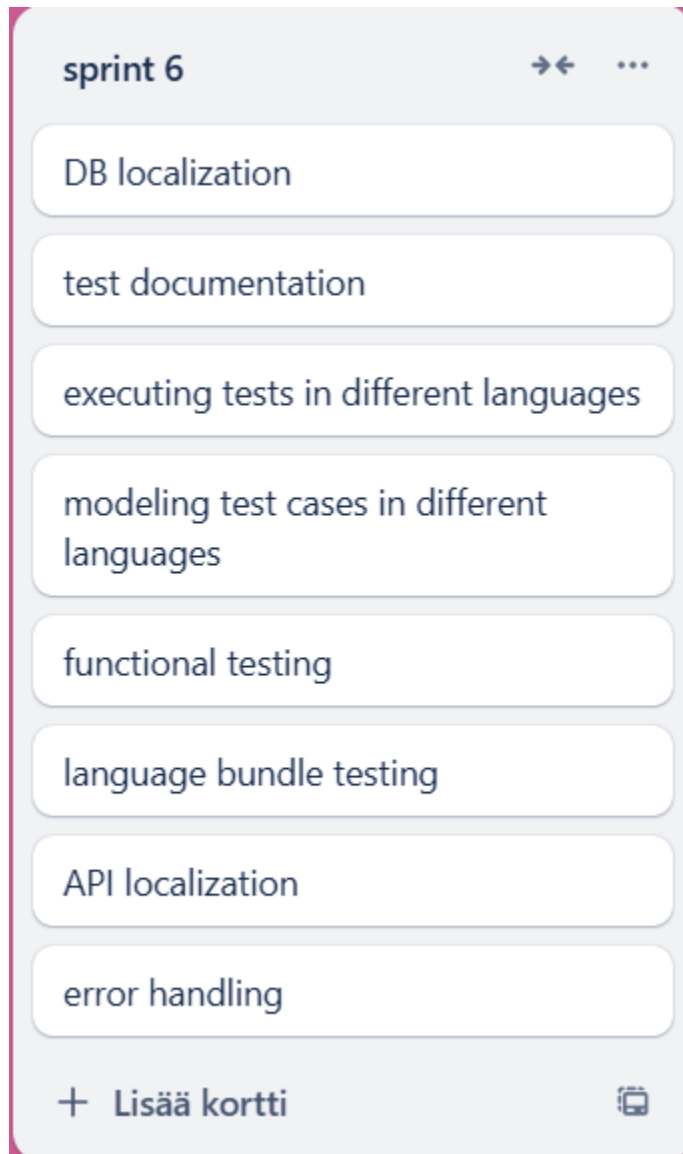
#### 4. Sprint 6 Review

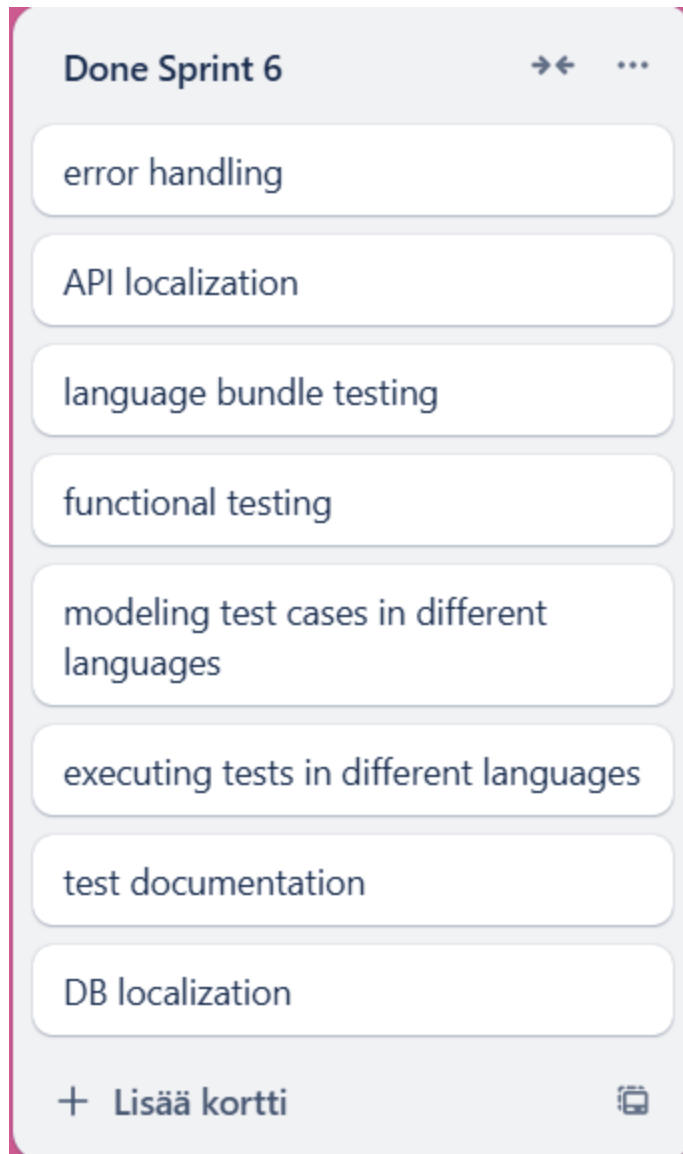
During this sprint, we have made stellar progress on testing, going as far as completing our testing models. Also, we have finalized database localization and enhanced the performance of the application by handling and fixing errors that we encountered during testing. Much time has been spent on making documentation for our project.

## 1. Estimated time usage.

Lenni	Sprint 1	5h	Sprint 5	12h
	Sprint 2	6h	Sprint 6	14h
	Sprint 3	13h	Sprint 7	
	Sprint 4	6h	Sprint 8	
Mikko	Sprint 1	15h	Sprint 5	12h
	Sprint 2	21h	Sprint 6	25h
	Sprint 3	35h	Sprint 7	
	Sprint 4	20h	Sprint 8	
Valtteri	Sprint 1	8h	Sprint 5	12h
	Sprint 2	15h	Sprint 6	12h
	Sprint 3	21h	Sprint 7	
	Sprint 4	10h	Sprint 8	
Onni	Sprint 1	5h	Sprint 5	12h
	Sprint 2	6h	Sprint 6	12h
	Sprint 3	10h	Sprint 7	
	Sprint 4	5h	Sprint 8	

Trello Board:





Per person, our group has worked on different issues regarding testing, and documentation. Some may vary in how much time they've put into the project but mostly it has been equal.

Overall, our goals were mostly met during this sprint, except we had a little misunderstanding about the six-sigma report.