

E-Commerce Website Development with Scrum Methodology

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I. Introduction

- Purpose and scope of the report

This report details the development of a shopping website, a project chosen for its relevance to our academic course in software engineering. Our goal was to apply classroom theory to real-world practice, mapping out the steps essential for creating an effective e-commerce platform.

Central to our project management was the use of Jira, which guided our task distribution, progress tracking, and sprint planning. This report will cover how Jira facilitated project organization and the challenges encountered, providing insight into our problem-solving strategies.

The report also delves into the process of requirement analysis, design, and implementation of the shopping website. It outlines the hurdles we faced, including technical issues and design challenges, and how these were addressed. In essence, it demonstrates our capacity to transform theoretical knowledge into practical solutions, underscoring the importance of hands-on experience in the field of web development.

- Brief background of the project

This project aimed to develop a comprehensive shopping website, accessible at <http://localhost:3000>. The website was conceptualized to offer a user-friendly shopping experience, integrating essential e-commerce features. Our journey involved requirement analysis, strategic design, and implementing functionalities that cater to diverse user needs.

II. Recall of Requirements Analysis

- Project objectives and expected outcomes

Our project's objective was to create a shopping website offering an intuitive user experience. Expected outcomes included a product search and display system, secure user accounts, effective order management, accessible customer service, insightful data reporting, and mobile-friendly design. These outcomes were anticipated to enhance user engagement and operational efficiency.

- Target user groups and use scenarios

The target user groups encompassed a wide range of online shoppers and site administrators. For shoppers, scenarios included searching for products, managing accounts, placing orders, and seeking customer support. Site administrators would focus on order processing, customer assistance, and data analysis.

- Functional and non-functional requirements

Functional requirements involved search functionality, account registration and login, shopping cart management, order tracking, data analysis tools, and mobile optimizations. Non-functional requirements included website performance, security measures, scalability, and user-friendly interface design.

III. Specification and Design

The project is a simple eCommerce application integrating WooCommerce REST API into a NextJS framework. It employs TypeScript, Redux, React hooks, and Ant Design. This project serves as an excellent starting point for developing a shopping cart website. The primary technologies used are TypeScript, Less, and JavaScript.

- Overview of the system architecture
 - Integrates WooCommerce REST API with NextJS framework.
 - Utilizes modern web development practices including TypeScript, Redux, and React hooks
 - Employs Ant Design for the user interface.
- Technology stack and tools used
 - Languages: Typescript
 - Frameworks and Libraries: NextJS, React, Redux, And design
 - APIs: WooCommerce REST API
- Design of Major components
 - Frontend: Using NextJS
 - State management: Utilizes Redux for managing application state
 - Backend integration: Connects with WooCommerce through REST API
 - Type safety: TypeScript is used to ensure type safety across the application

IV. Project Management through Jira

- Project management approach and how Jira was utilized

In our project, we employed the Scrum agile framework, managed through Jira.

We divided the project requirements into several epics, further broken down into user stories, each with assigned story points to estimate the effort needed and some of them are divided into subtasks.

The project was organized into sprints, with clear start and end dates set to maintain a strict timeline. High-priority issues were selected from the backlog during sprint planning sessions, while others remained queued for future sprints.

Each issue was prioritized to guide team members towards the most urgent and critical tasks. Bugs encountered were logged in Jira with set priorities and due dates, ensuring prompt and efficient resolution.

Jira facilitated a structured and organized project environment, offering clear visibility of progress and optimizing workflow and resource allocation.

- Issue (epic, user story, task, bug)

We divided the project into seven epics,

Epic 0: Project Template Discovery

Epic 1: Product Discovery and Display

Epic 2: User Account System

Epic 3: Order Processing System

Epic 4: Customer Service and Support

Epic 5: Data Analysis and Reporting

Epic 6: Mobile Optimization

Order by Created ↓ ▾

🔧 **SCRUM-34**

[Epic 0: Project Template Discovery](#)

🔧 **SCRUM-33**

Epic 6: Mobile Optimization

🔧 **SCRUM-32**

Epic 5: Data Analysis and Reporting

🔧 **SCRUM-31**

Epic 4: Customer Service and Support

🔧 **SCRUM-30**

Epic 3: Order Processing System

🔧 **SCRUM-29**

Epic 2: User Account System

🔧 **SCRUM-28**

[Epic 1: Product Discovery and Display](#)

Each epic has the information of description, assignee, reporter, start date, due date, and child issues.

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Epic 1: Product Discovery and Display

Attach Add a child issue Link issue Link goals

Description
Implement a user-friendly system for product discovery and display including search, categorization, and recommendations.

Child issues Order by 20% Done

Issue ID	Description	Estimate	Assignee	Status
SCRUM-5	Users can browse products	2	SL	DONE
SCRUM-17	Users can filter product listings by categories	3	SL	TO DO
SCRUM-43	Product search results are not sorted by relevance	3	BS	TO DO
SCRUM-35	search for products by keywords	2	SL	TO DO
SCRUM-9	Administrators can add new products	2	SL	IN REVIEW

Details

Assignee: SL Shangzhi Lou
Labels: None
Start date: 15 Dec 2023
Due date: 31 Jan 2024
Reporter: SL Shangzhi Lou

Status updates Connect an Atlas project

Created yesterday
Updated yesterday

Activity
Show: All Comments History
Newest first

BS Add a comment...
Pro tip: press **M** to comment

The user stories are the child issues of epics, and each of them belongs to a epic. Each user stories has the information of description, assignee, reporter, start date, due date, estimated story point which estimates the workloads and priority.

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view the total price of items in shopping cart

Attach Add a child issue Link issue

Description
As a shopper, I need to view the total price of items in my shopping cart so that I can decide whether to make a purchase.

Child issues Order by 0% Done

Issue ID	Description	Estimate	Assignee	Status
SCRUM-41	Design the shopping cart database model	2	SL	TO DO
SCRUM-42	Create the shopping cart front-end UI	1	SL	TO DO

Details

Assignee: SL Shangzhi Lou
Priority: Medium
Labels: None
Sprint: SCRUM Sprint 3
Story point estimate: 3
Start date: None
Due date: None
Reporter: BS Bi Sainan

Created yesterday
Updated yesterday

Activity
Show: All Comments History
Newest first

BS Add a comment...
Pro tip: press **M** to comment

As we could see in this example of user story, there are two child issues which are the tasks. Task can also have the details as user stories, and it can be assigned to the different person from parent issue.

We also have the another type of issue, which is bug. It can be used to explicitly call out unplanned work. It helps improve overall quality.

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'username already exists' error message is not displayed

Attach Add a child issue Link issue

Description
The 'username already exists' error message is not displayed during user registration.

Activity
Show: All Comments History Newest first

Add a comment...

Pro tip: press **M** to comment

Details

Priority: Medium

Assignee: Shangzhi Lou
Assign to me

Labels: None

Sprint: SCRUM Sprint 2

Story point estimate: 1

Due date: None

Start date: None

Reporter: Bi Sainan

- Number and duration of sprints

Our project was structured into five sprints, each with a duration of two weeks. As of the current date, we have successfully completed the first sprint. There are several issues in the backlog that have not yet been assigned to upcoming sprints. As we proceed, these backlog items will be incorporated into future sprints based on their priority and dependencies.

Remaining Sprints:

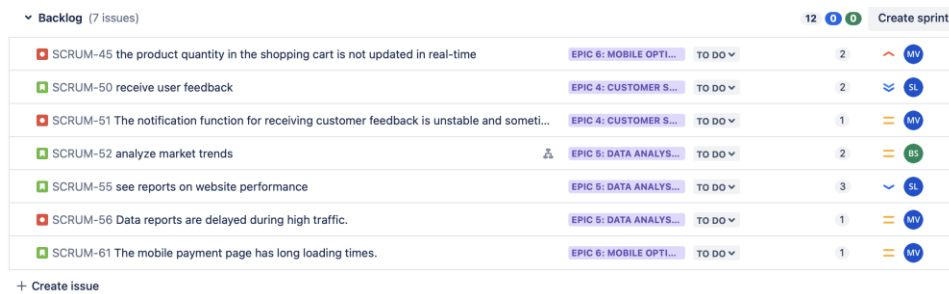
SCRUM Sprint 2 11 Dec – 25 Dec (5 issues)					1	12	0	Complete sprint	...
SCRUM-3 User can create an account	EPIC 2: USER ACCOU...	IN PROGRESS	4	BS					
SCRUM-44 'username already exists' error message is not displayed	EPIC 2: USER ACCOU...	TO DO	1	SL					
SCRUM-8 Users can place an order	EPIC 3: ORDER PROC...	IN PROGRESS	3	BS					
SCRUM-9 Administrators can add new products	EPIC 1: PRODUCT DIS...	IN REVIEW	2	SL					
SCRUM-22 Understand and refactoring code base	EPIC 0: PROJECT TE...	IN PROGRESS	3	MY					
+ Create issue									

SCRUM Sprint 3 25 Dec – 8 Jan (4 issues)					9	0	0	Start sprint	...
SCRUM-15 Users can track the status of their orders	EPIC 3: ORDER PROC...	TO DO	3	SL					
SCRUM-46 The order tracking page returns a 404 error	EPIC 3: ORDER PROC...	TO DO	1	SL					
SCRUM-10 Users can view order history	EPIC 3: ORDER PROC...	TO DO	2	BS					
SCRUM-37 view the total price of items in shopping cart	EPIC 3: ORDER PROC...	TO DO	3	SL					
+ Create issue									

SCRUM Sprint 4 8 Jan – 22 Jan (5 issues)					13	0	0	Start sprint	...
SCRUM-17 Users can filter product listings by categories	EPIC 1: PRODUCT DIS...	TO DO	3	MY					
SCRUM-43 Product search results are not sorted by relevance	EPIC 1: PRODUCT DIS...	TO DO	3	BS					
SCRUM-35 search for products by keywords	EPIC 1: PRODUCT DIS...	TO DO	2	MY					
SCRUM-14 Users can write product reviews	EPIC 4: CUSTOMER S...	TO DO	2	BS					
SCRUM-36 manage user account information	EPIC 2: USER ACCOU...	TO DO	3	SL					
+ Create issue									

SCRUM Sprint 5 22 Jan – 5 Feb (4 issues)					13	0	0	Start sprint	...
SCRUM-16 Administrators can manage user accounts	EPIC 2: USER ACCOU...	TO DO	4	MY					
SCRUM-47 submit my queries through an online form	EPIC 4: CUSTOMER S...	TO DO	3	BS					
SCRUM-60 payment process on mobile devices	EPIC 6: MOBILE OPTI...	TO DO	2	BS					
SCRUM-57 have a shopping experience on phone	EPIC 6: MOBILE OPTI...	TO DO	4	SL					
+ Create issue									

Remaining issues outside the sprints:

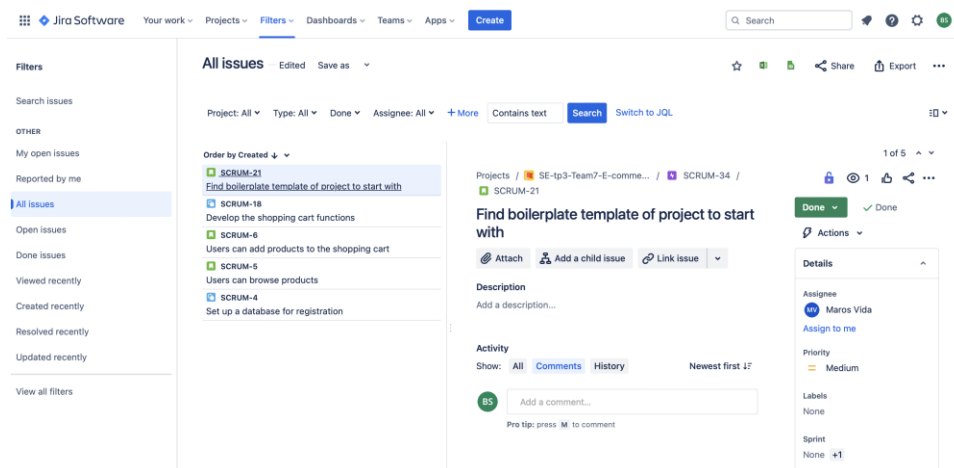


A screenshot of the Jira Backlog view showing 7 issues. The issues are listed in a table with columns for issue key, description, epic, status, priority, and assignee. The issues are: SCRUM-45 (product quantity not updated), SCRUM-50 (receive user feedback), SCRUM-51 (notification function unstable), SCRUM-52 (analyze market trends), SCRUM-55 (see reports on website performance), SCRUM-56 (Data reports delayed), and SCRUM-61 (mobile payment page loading times). All issues are in 'TO DO' status.

Issue Key	Description	Epic	Status	Priority	Assignee
SCRUM-45	the product quantity in the shopping cart is not updated in real-time	EPIC 6: MOBILE OPTI...	TO DO	2	MV
SCRUM-50	receive user feedback	EPIC 4: CUSTOMER S...	TO DO	2	SL
SCRUM-51	The notification function for receiving customer feedback is unstable and somet...	EPIC 4: CUSTOMER S...	TO DO	1	MV
SCRUM-52	analyze market trends	EPIC 5: DATA ANALYS...	TO DO	2	BS
SCRUM-55	see reports on website performance	EPIC 5: DATA ANALYS...	TO DO	3	SL
SCRUM-56	Data reports are delayed during high traffic.	EPIC 5: DATA ANALYS...	TO DO	1	MV
SCRUM-61	The mobile payment page has long loading times.	EPIC 6: MOBILE OPTI...	TO DO	1	MV

- Filter issues through status, type and assignee

We can access all issues through fillers, where we can filter issues through status, type and assignee. Here is an example for done issues.

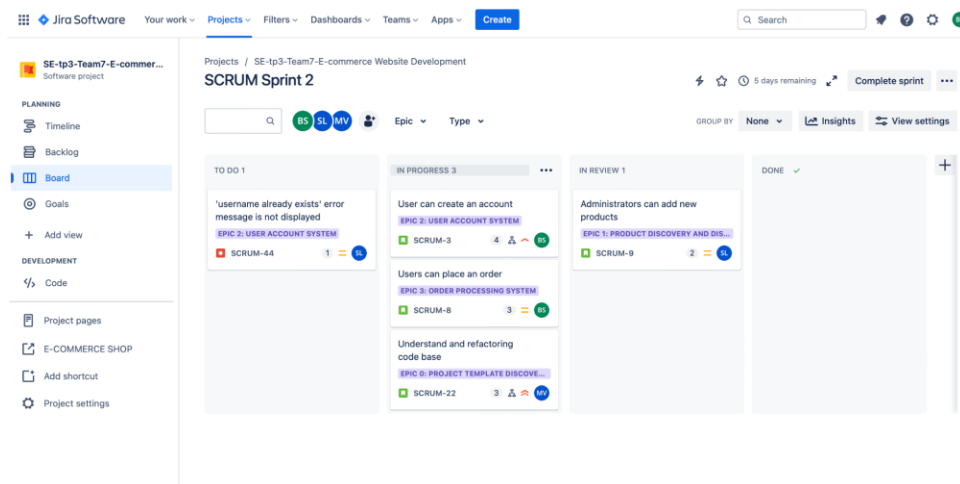


A screenshot of the Jira 'All issues' view. The left sidebar shows a list of filters, including 'All issues'. The main area displays a list of issues, with the first issue selected: 'Find boilerplate template of project to start with'. The right sidebar shows the details of this issue, including the assignee (Maros Vida), priority (Medium), and labels (None).

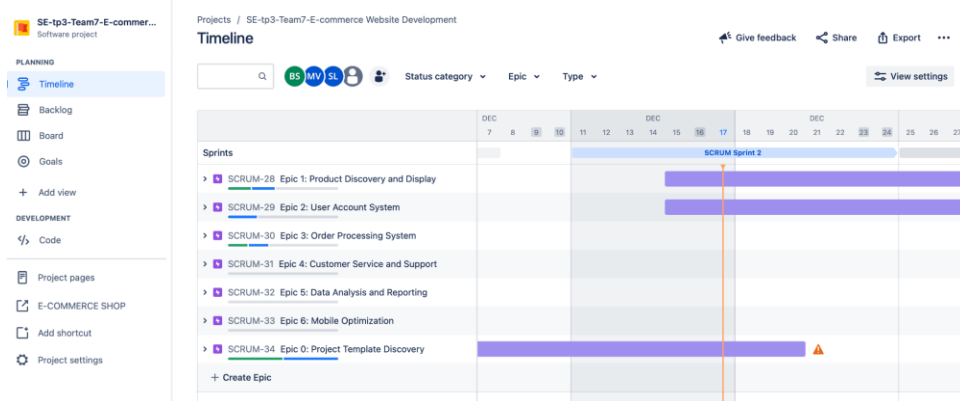
- Check the issues through 'Timeline' and 'Board'

To monitor the progress and manage tasks efficiently in our e-commerce website development project, we utilize Jira's 'Board' and 'Timeline' features.

The 'Board' allows us to view the current status of specific tasks within our active Sprint—identifying what's to do, in progress, in review, or done—ensuring transparency.

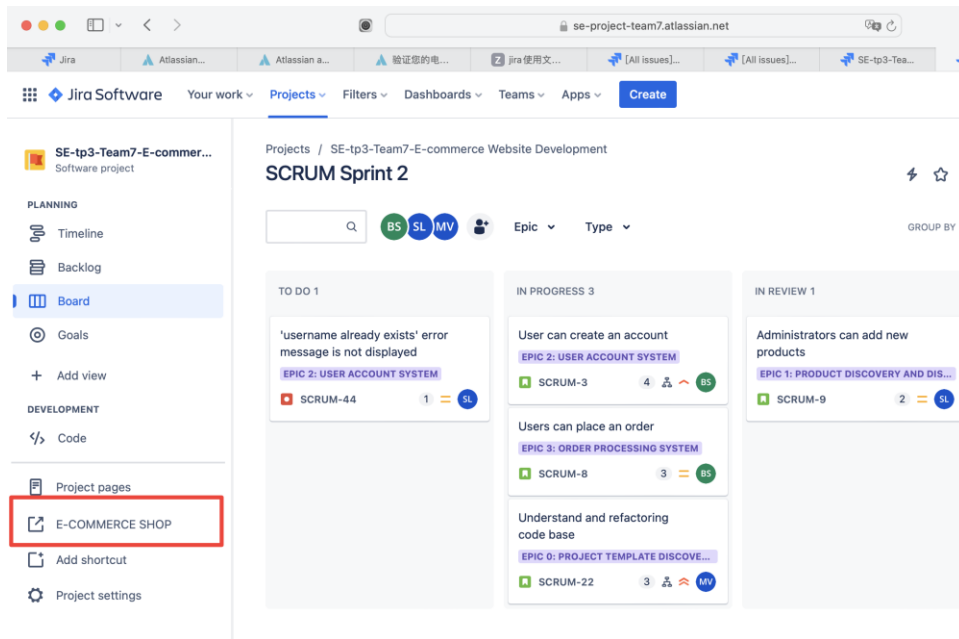


Simultaneously, the 'Timeline' gives us a high-level view of our project's epics over time, helping us to understand how different tasks are scheduled and how they align with our overall project milestones. This dual perspective enables strategic planning and real-time tracking, which is crucial for agile project management and meeting our delivery deadlines.

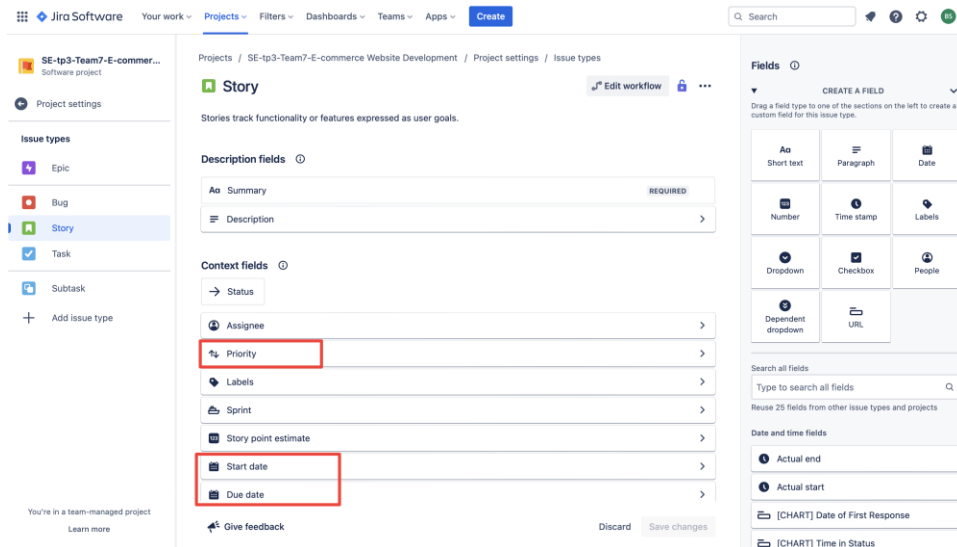


- Other personal setting

We add an shortcut of the E-commerce shop on the left, for the convience of access.



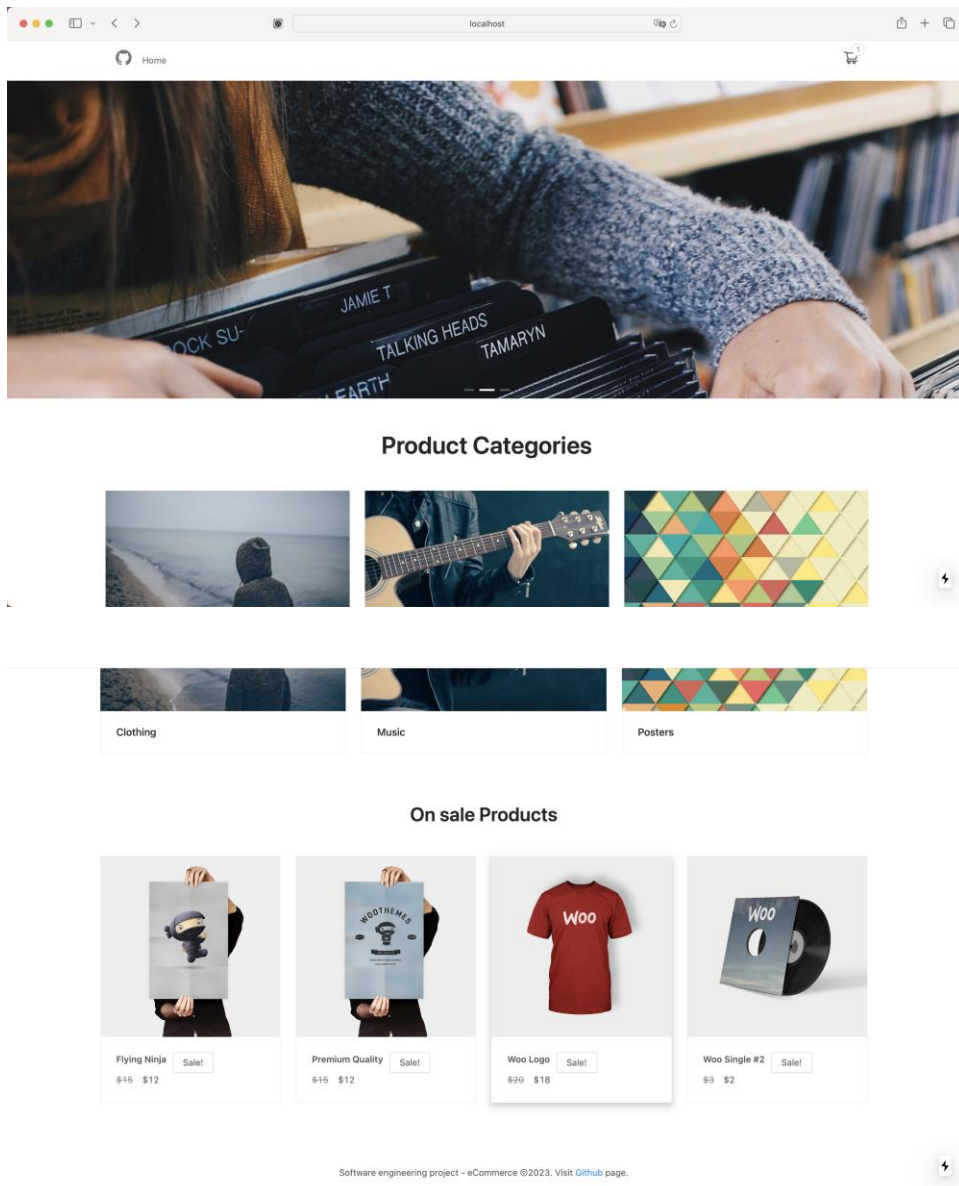
We made some personal setting through project setting where we add priority, start date and due date for user stories, which we think it is important to display.



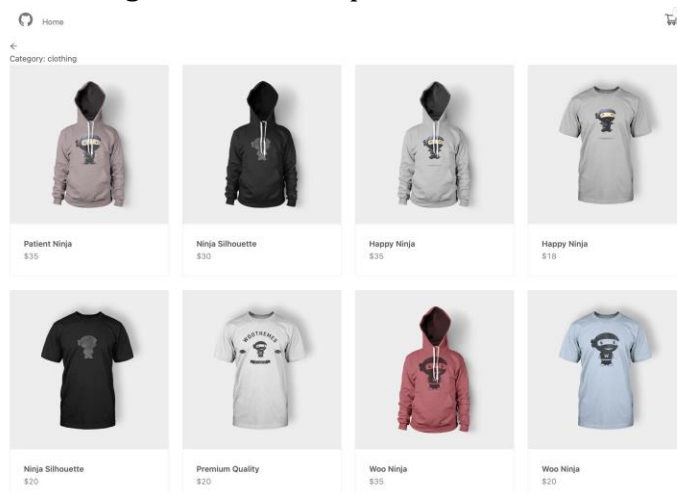
V. Explanation of the Website/Application Plan and Interfaces

- Structure and navigation flow of the website/application

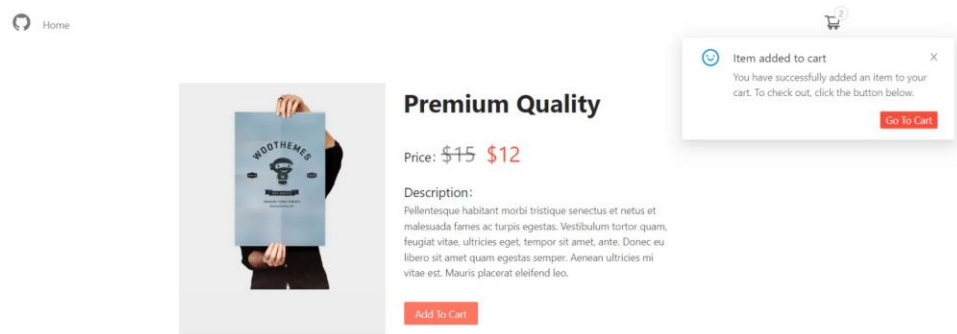
The website, accessible at <http://localhost:3000>, features a user-centric structure designed for seamless navigation. Upon landing, users are greeted by a homepage that showcases the background pictures, an array of product categories and on sale products. It shows the shopping cart in the top right corner and the github link in the top left corner. The version number is displayed at the bottom of the page.



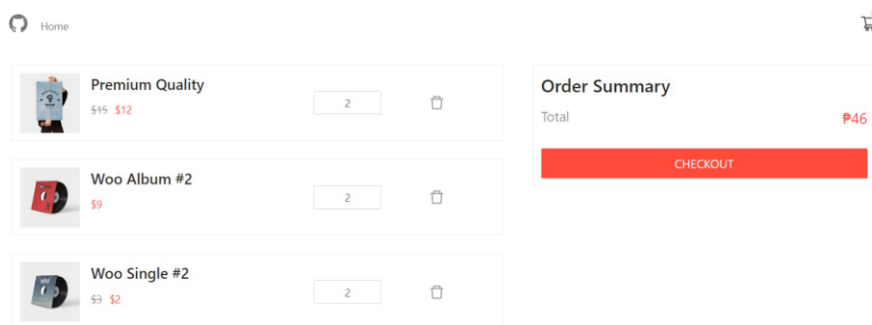
The 'Products' section is organized into subcategories, allowing users to filter items based on their preferences. Each product category page includes items with high-resolution images, names, and prices.



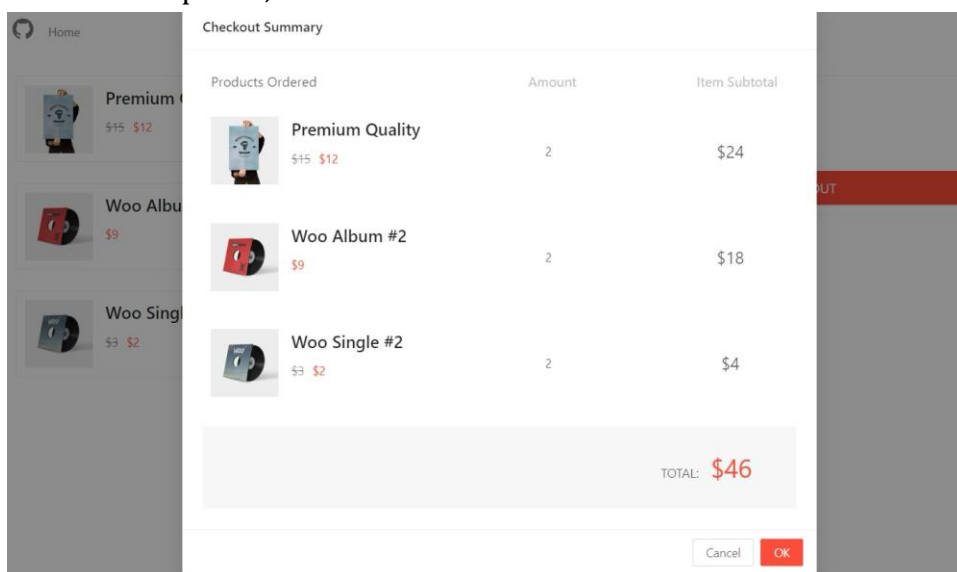
When clicking on a specific item, it shows detailed descriptions, and the option to add to cart.



The 'Cart' page shows the items we chose on the left and the total prices of our items on the right, then we can click on the button 'checkout' to process our order.



The 'Checkout' page shows the summary of products ordered including products' amount and prices, then we can click the button 'cancel' or 'ok' to enter next step.



- Explanation of user interface and interaction design

The interface of **http://localhost:3000** is intuitive, featuring a clean layout with background images and prominent product displays. A persistent shopping cart icon and GitHub link offer quick access from anywhere on the site. Product categories are neatly organized, leading to individual items with clear images, names, and prices. The user experience is streamlined, with descriptive item pages and a straightforward add-to-cart function. The cart page simplifies checkout, displaying items and totals side by side, leading to a concise checkout page where users can review their order and choose to proceed or cancel with a single click.

VI. Conclusion

- Main achievements and impact of the project

This project's journey began with referencing existing source code, providing us with a solid foundation from which to develop. Our team's ability to understand, modify, and enhance this code has been a pivotal achievement. Coupled with the diligent use of Jira to track our project's progression, we have effectively navigated through complex development phases. Our endeavors have culminated in a shopping website that not only serves its functional purpose but also stands as a testament to our adaptive project management and software development skills.

- Directions and recommendations for future work

While significant progress has been made, there remain unfinished epics, such as Epic 4: Customer Service and Support, and Epic 5: Data Analysis and Reporting, as outlined in our Jira backlog. Future efforts should prioritize the completion of these epics to enhance customer interaction and back-end data processing capabilities. We suggest incrementally addressing these areas in subsequent sprints, ensuring that each feature is thoroughly developed and integrated. Continual iteration and prioritization in Jira will be key to the ongoing enhancement of the website, ensuring all functionalities align with user needs and business objectives.

VII. Appendices and References

- Links to relevant documents and resources

Github : <https://github.com/marosvida/project-software-engineering>

Jira: <https://se-project-team7.atlassian.net/jira/software/projects/SCRUM/boards/1>

Video:

https://drive.google.com/file/d/1xzGUaCJnoelbuCZ3aj53fXPglvQR3T_A/view?usp=drive_link

Presentation: https://drive.google.com/file/d/1jSBXlCwpr0oGNdM3dZUliHfIMIS7-Hee/view?usp=drive_link