PES UNIVERSITY
BENGALURU
Department of Computer Science and Engineering

Project Plan Document

For

E-Commerce with Sentiment Analysis

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Project Plan Document

Lifecycle Model

We have chosen the **Incremental Model** as the primary lifecycle approach For the execution of our E-Commerce website project. Implementing an E-Commerce website is a complex project that involves various stages and continuous improvement to adapt to changing requirements and market conditions. The Incremental Model is a flexible and iterative software development process that allows for the gradual addition of features and functionalities in successive cycles or increments. This approach aligns well with the dynamic nature of e-commerce projects, enabling us to respond effectively to evolving requirements, market trends, and user feedback.

Incremental Lifecycle Model

1. **Planning and Requirements Gathering:**
-In the initial phase we gather high-level requirements and define project goals and objectives. We identify the core features and functionalities of the e-commerce website.

2. **Architectural Design:**
-Design the system architecture, considering scalability, security, and performance. Create a high-level design of the website.

3. **Iterative Development and Testing:**
- Divide the development process into smaller increments or iterations, typically 2-4 weeks in length.
- Develop a minimal viable product (MVP) during the first iteration. This may include basic product catalogue, user registration, and shopping cart features.
- Test and validate the features developed in each iteration.
- Make improvements based on feedback and emerging requirements.

4. **User Feedback and Enhancements:**
- Collect feedback from users, stakeholders, and market trends.
- Prioritize enhancements and new features based on feedback and evolving business needs.
- Implement changes in subsequent iterations.

5. **Security and Performance Enhancements:**
- Continuously monitor and enhance website security and performance.
- Address any vulnerabilities and optimize performance to ensure a seamless user experience.

6. **Content and Data Management:**
- Implement content management systems for easy updates and additions of product listings and information.

- Manage product data efficiently, possibly through integration with product information management (PIM) systems.

7. **Payment and Checkout System Integration:**
   - Integrate secure payment gateways and optimize the checkout process.
   - Ensure compliance with industry standards and regulations.

8. **Scaling and Load Testing:**
   - As traffic and demand increase, scale the infrastructure to handle additional load.
   - Conduct load testing to identify and rectify performance bottlenecks.

9. **Continuous Monitoring and Maintenance:**
   - Implement continuous monitoring to detect issues in real-time.
   - Regularly maintain and update the website to stay current with technology and security trends.

Incremental Lifecycle Model for E-commerce Website Development

Iteration 1

Planning and Initial Requirements Gathering:
Define project goals, objectives, and high-level requirements.
Identify the core features, such as user registration and authentication, product listing, and search.

Iteration 2

User Registration and Authentication:
Develop user registration functionality.
Implement authentication features.
Conduct testing and validation.

Iteration 3

Product Listing and Search:
Develop the product listing functionality, including product catalog and categories.
Implement the product search feature.
Integrate basic user authentication from the first iteration.
Test and validate the features.

Iteration 4

Shopping Cart Management:
Create the shopping cart functionality.
Allow users to add and manage items in the cart.
Integrate with the previous features.
Test and validate the shopping cart.

Iteration 5

Checkout Process:
Develop the checkout process, including order review and payment.
Integrate with the shopping cart, product listing, and user registration features.
Conduct testing and validation.

Iteration 6

Sentiment Analysis of Product Reviews:
Implement sentiment analysis for product reviews.
Integrate this functionality with the product listing.

Test and validate the sentiment analysis feature.

Iteration 7

Testing, Additional Features and Refinements:
Continue to add additional features based on evolving requirements.
Enhance existing functionalities.
Conduct regular testing, user feedback analysis, and improvements.

Once all the iterations are completed successfully, the model is deployed and is ready to be used in the market.

Justification for Using Incremental Model:

Adaptability to Changing Requirements: An e-commerce website's requirements can evolve rapidly due to changing market conditions, customer preferences, and technology advancements. The incremental model allows you to adapt to these changes effectively by developing and integrating features in iterations.

User-Centric Approach: Incremental development encourages frequent user involvement and feedback. This is essential for e-commerce, as user needs and expectations are critical. Features like user registration and authentication, shopping cart management, and sentiment analysis can be refined based on user feedback.

Early Delivery of Value: Incremental development enables the delivery of a minimum viable product (MVP) early in the project, allowing you to launch a functional website quickly and start generating revenue. In the e-commerce industry, time-to-market is often crucial.

Risk Mitigation: By breaking the project into smaller increments, risks can be identified and addressed earlier in the development process, reducing the chances of costly errors or changes in later stages.

Continuous Improvement: The incremental model promotes ongoing enhancements and refinements, ensuring that the e-commerce website stays competitive and up-to-date.
In conclusion, the incremental lifecycle model is a well-suited approach for developing an E-Commerce website due to its adaptability, risk mitigation, focus on user feedback, and ability to deliver a high-quality product in a dynamic and competitive market.

In conclusion, the incremental lifecycle model is a well-suited approach for an e-commerce website project due to its adaptability, customer focus, early value delivery, risk management, and support for continuous improvements. It aligns well with the dynamic nature of e-commerce and its evolving requirements.

Tools used throughout the lifecycle
planning tool, design tool, version control, development tool, bug tracking, testing tool.

In an Agile Scrum approach for e-commerce website development, we use a variety of tools to support different aspects of the project lifecycle. The tools used are:

For each phase of the incremental lifecycle model in the development of your e-commerce website, different tools and an operating environment will be utilized to ensure a smooth and efficient workflow. Here's a breakdown of the tools and the operating environment you might use throughout the project:

Planning Tool:
- Tool: Jira
- Use: To plan, organize, and track the progress of tasks and iterations.

Design Tool:
- Tool: ReactJS, NodeJS, Express, CSS, Java script
- Use: To create wireframes and webpages and design assets for the user interface and user experience (UI/UX) design.

Version Control Collaboration and Communication Tools:
- Tool: Git (e.g., GitHub, GitLab, Bitbucket).
- Use: To track changes to the source code, collaborate among developers, and manage version history.
- Slack: Slack is a team collaboration platform for real-time communication and file sharing.
- Microsoft Teams: communication and collaboration.

Development Tool:
- Tool: Integrated Development Environments (IDEs) like Visual Studio Code, PyCharm, Notepad++
- Use: To write, test, and debug code for the website's functionalities.

Testing Tool:
- Tool: Selenium, Postman
- Use: To automate testing processes, perform unit testing, integration testing, and system testing, and validate the functionality of the website.

Selenium: Selenium is an open-source testing framework for web applications. It's particularly useful for automated testing of the user interface and functionalities on your e-commerce website.
Postman: Postman is a tool for API testing, which is essential for e-commerce websites with backend APIs.

Operating Environment:
- Hardware Platform: Standard web server infrastructure, including web server and database server, with specific hardware requirements determined during system architecture design.
- Operating System and Versions: Compatibility with commonly used operating systems such as Windows Server, Linux (e.g., Ubuntu), and cloud-based platforms (e.g., AWS, Azure).
- Software Components: Compatibility with various software components, including web browsers (e.g., Google Chrome, Mozilla Firefox, Safari), web server software (e.g., Apache, Nginx), and database management systems (MongoDB).

These tools help ensure a well-structured, efficient, and secure development process while adhering to the defined constraints and operating environment requirements. We use the above mentioned tools to meet the requirements of our e-commerce website project.

Deliverables categorised as reuse/build components

Reuse Components:

1. User Authentication Module:
   - Categorization: Reuse Component
   - Justification: User authentication is a common feature across e-commerce websites. A well-developed authentication module can be reused for security purposes in future e-commerce projects.

2. Common Libraries and Frameworks:
   - Categorization: Reuse Component
   - Justification: Common libraries and frameworks, such as JavaScript libraries, CSS frameworks, or code components for user interface elements, can be reused to maintain consistency in design and functionality across e-commerce projects.

3. Shopping Cart Module:
   - Categorization: Reuse Component
   - Justification: Shopping cart functionality is a fundamental feature in e-commerce. A reusable shopping cart module can save development time and ensure consistency in cart management.

Build Components:

1. **Product Listing and Search Module:**
   - Categorization: Build Component
   - Justification: The product listing and search functionality may vary significantly based on the unique requirements of each e-commerce project. Therefore, it needs to be custom-built to accommodate specific product data and search criteria.

2. **Custom Sentiment Analysis Module:**
   - Categorization: Build Component
   - Justification: Sentiment analysis of product reviews is project-specific, and the models and algorithms may vary. Therefore, a custom sentiment analysis module needs to be built for each project.

3. **Checkout Process:**
   - Categorization: Build Component
   - Justification: The checkout process involves unique business rules, payment integrations, and shipping options. Thus, it should be custom-built to suit the specific needs of the current e-commerce website.

4. **Product Catalogue Database Schema:**
   - Categorization: Build Component

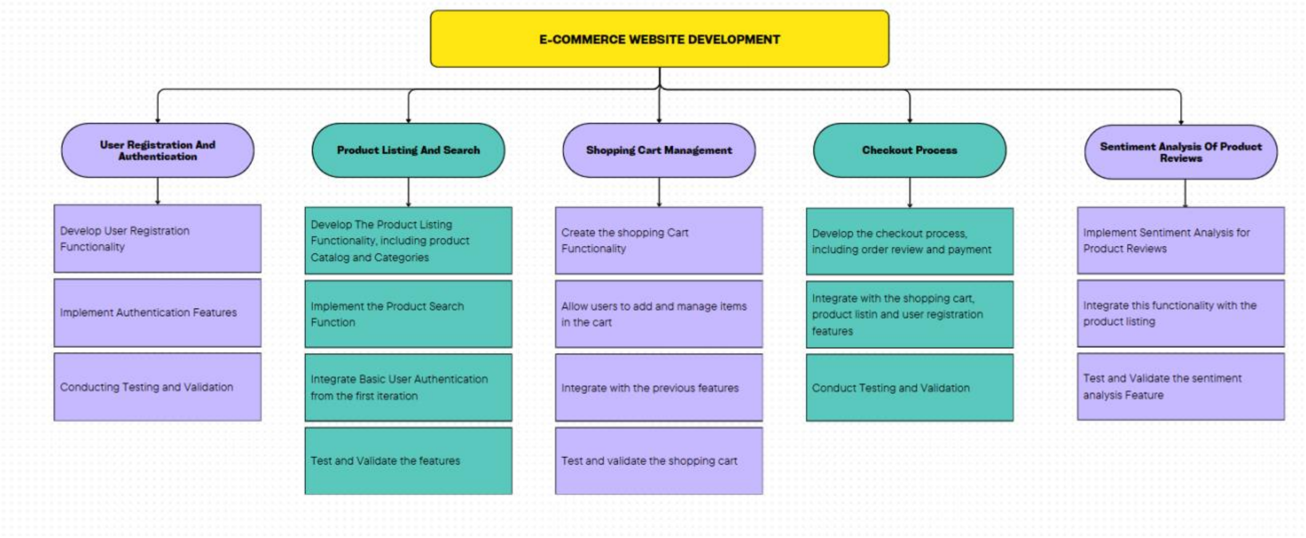
- Justification: The structure and organization of the product catalogue database may vary based on the project's unique product data and requirements, making it a project-specific build component.

5. **Payment Gateway Integration:**
   - Categorization: Build Component
   - Justification: Payment gateway integration is specific to the chosen payment service and involves custom API integrations and configurations tailored to the project's needs.

6. **Bug Fixes and Issue Resolutions:**
   - Categorization: Build Component
   - Justification: Bug fixes and issue resolutions are specific to the current project and address unique issues that arise during development and post-launch phases.

The categorization of deliverables is based on the project's unique requirements and the extent to which certain components can be generalized for reuse. It is essential to assess each deliverable's potential for reuse and evaluate the practicality of doing so within the context of an organization's practices and project constraints.

WBS for the entire functionalities


E-COMMERCE WEBSITE DEVELOPMENT
User Registration And Authentication
Develop User Registration Functionality
Implement Authentication Features
Conducting Testing and Validation
Product Listing And Search
Develop The Product Listing Functionality, including product Catalog and Categories
Implement the Product Search Function
Integrate Basic User Authentication from the first iteration
Test and Validate the features
Shopping Cart Management
Create the shopping Cart Functionality
Allow users to add and manage items in the cart
Integrate with the previous features
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Develop the checkout process, including order review and payment
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Implement Sentiment Analysis for Product Reviews
Integrate this functionality with the product listing
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Estimate of effort required to accomplish each task in terms of person months.

Task 1: Planning And Initial Requirements

Participants: Entire Team
Time Allocated: 1 Month
Person Months: 4 x 1 = 4 Person Months

Task 2: User Registration And Authentication

Participants: Kusum, Maryam [2]
Time Allocated: 1 Months
Person Months: 2 x 1 = 2 Person Months

Task 3: Product Listing And Search

Participants: Hashim, Maryam [2]
Time Allocated: 1.15 Months
Person Months: 2 x 1.15 = 2.3 Person Months

Task 4: Shopping Cart Management

Participants: Kusum, Hashim [2]
Time Allocated: 1.611 Months
Person Months: 2 x 1.6 = 3.2 Person Months

Task 5: Checkout Process

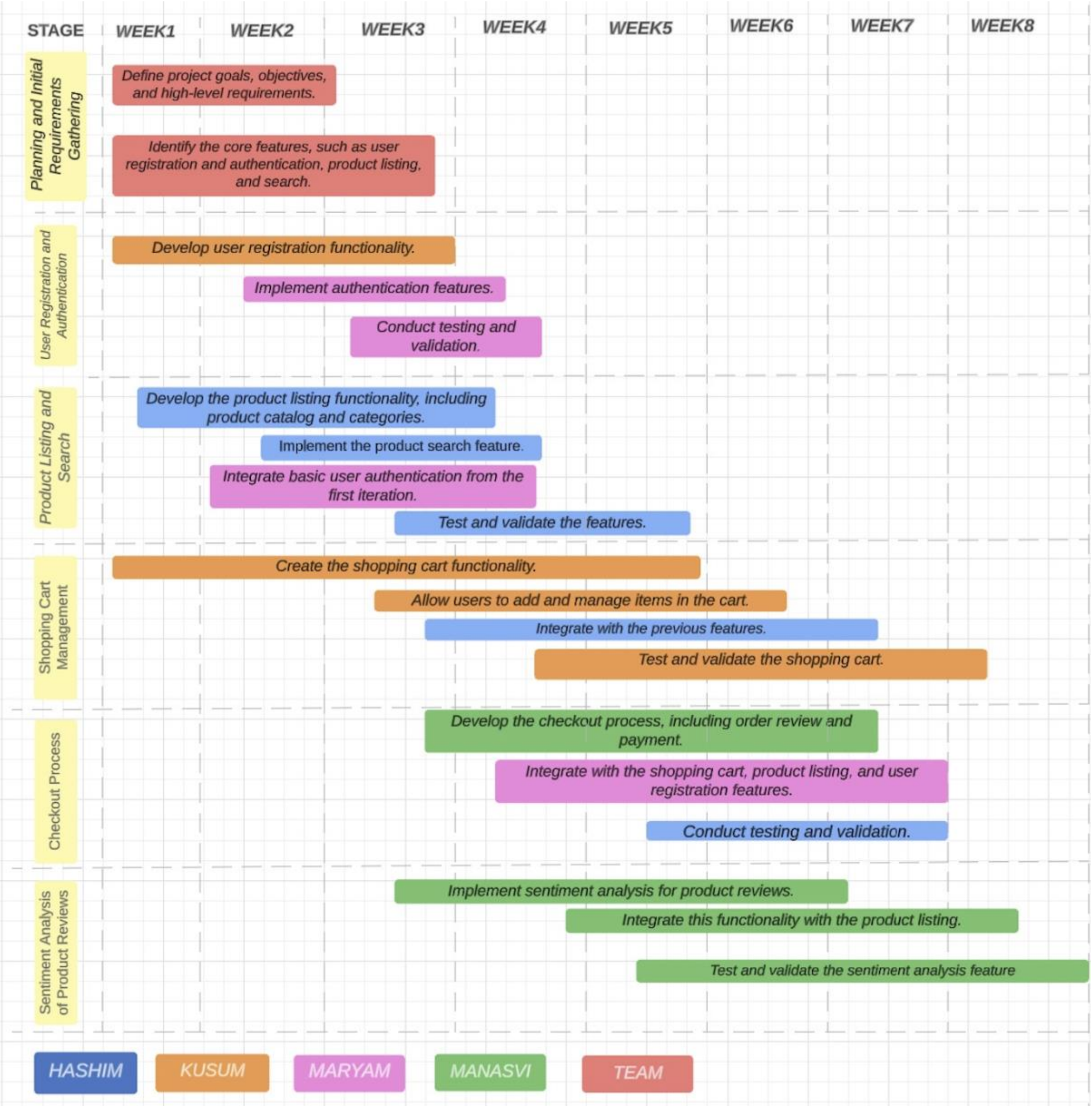
Participants: Manasvi, Maryam, Hashim [3]
Time Allocated: 1 Months
Person-Months: 3 x 1 = 3 Person Months

Task 6: Sentiment Analysis Of Product Reviews

Participants: Manasvi [1]
Time Allocated: 1 Months
Person Months: 1 x 1 = 1 Person Months

Total Estimate Of Effort = 15.5 Person Months

Gantt Chart


STAGE
WEEK1
WEEK2
WEEK3
WEEK4
WEEK5
WEEK6
WEEK7
WEEK8
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