



Software Engineering and Agile Practices

Assignment – 1st

Submitted To: Dr. Sonali Vyas

Submitted By:

TEAM ID	TEAM MEMBERS	SAP ID	CONTRIBUTION
TEAM 08	Akash Kumar Yadav	500124804	25%
	Chhavi Kharab	500118635	25%
	Gourav Bhatt	500124805	25%
	Vibhu Kumar	500126236	25%

Consider the given application
"ONLINE SHOPPING WEBSITE"
and identify the following:

1. Problem Statement
2. Objectives
3. Identify the various stakeholders.
4. Resources (External / Internal)
5. Requirements (Functional and non-functional)
6. Modules
7. Pick a suitable process model to apply with a reason.

PROBLEM STATEMENT

To design an intuitive and user friendly interface that provides a seamless shopping experience across various devices and screen sizes to expand reachability. Incorporating efficient yet simplistic navigation, clear product categorization, effective search functionality and a streamlined checkout process to reduce cart abandonment rates and encourage conversions. Handling a large number of concurrent users, varying traffic loads and extensive product catalogues while maintaining fast load times and responsive user interfaces. Ensuring that the website remains performant during peak shopping seasons and sales. With a secure and compliant payment processing system that protects sensitive customer information.

OBJECTIVES

1. Scalability Objective:

Ensure the website's architecture and infrastructure are designed to scale horizontally, accommodating increased user traffic and growing product inventories.

Implement Performance Optimization Techniques, such as caching, load balancing, and content delivery networks, to maintain fast page load times and robust responsiveness.

2. Security and Compliance Objective:

Develop a robust and secure payment processing system that adheres to industry security standards like PCI DSS. Implement encryption protocols for transmitting sensitive data and employ secure authentication mechanisms to protect user accounts. Ensure compliance with data privacy regulations, allowing users to control their data and providing transparent privacy policies.

3. User Experience Objective:

Design an intuitive and visually appealing user interface that prioritizes user experience and ease of navigation. Implement responsive design

principles to ensure consistent functionality and aesthetics across different devices. Streamline the product discovery process with effective search functionality, personalized recommendations, and clear product categorization.

4. Integration and Accessibility Objective:

Integrate the website with third-party systems such as inventory management, order fulfillment, and customer relationship management systems, to streamline business operations. Ensure the website meets accessibility standards (such as WCAG) to make it usable by people with disabilities, enhancing inclusivity and reaching a wider audience.

5. Efficient Checkout Process Objective:

Simplify the checkout process to minimize cart abandonment rates and improve conversion rates. Implement a guest checkout option along with user accounts to cater to various customer preferences. Offer multiple payment methods and provide a transparent breakdown of costs, including taxes and shipping fees, before finalizing the purchase.

STAKEHOLDERS

1. Customers:
The primary users of the website who visit, browse, and make purchases. Their satisfaction and ease of use are crucial to the website's success.
2. Business Owners / Management:
Those who own or manage the online shopping business. They are interested in the website's profitability, growth, and alignment with the business's goals.
3. Developers and IT Team:
The technical team responsible for building, maintaining, and updating the website's information infrastructure, feature, and security.
4. Designers and User Experience (UX) Team:
Professionals responsible for creating the visual design, user interface, and overall user experience of the website.
5. Marketing and Sales Team:
These teams are interested in how the website supports marketing campaigns, promotes products, and drives sales conversions.

6. **Product Managers:**
Those responsible for curating and managing the product catalog, ensuring accurate listings, availability and product information.
7. **Payment Gateway Providers:**
Companies that handle the payment processing and ensure the security and functionality of online transactions.
8. **Delivery and Order Partners:**
Those responsible for processing orders, managing inventory, and ensuring timely and accurate delivery of products.
9. **Customer Service and Support:**
Professionals who assist customers with inquiries issues, returns, and provide a positive post purchase experience.
10. **Analytics and Insights Team:**
Those who analyze website data to provide insights into user behaviour, trends, and the website's overall performance.
11. **Partners and Suppliers:**
Companies or individuals who supply products, services, or technologies that are integrated into the website's operations.
These are responsible for delivering brand-specific products.

12. Investors or Shareholders:
Those who have invested in the business and are interested in its financial performance and growth.
13. Government / Regulatory Authorities:
Government bodies or regulatory agencies responsible for overseeing certain aspects of online commerce and data protection.
14. Technology Vendors:
Providers of software, tools, and services that the website relies on such as hosting providers, content delivery networks and security solutions.

Effective communication and collaboration among these groups are essential for successful development launch, and ongoing operation of the website.

RESOURCES

1. Internal Resources:
These are necessary for developing and operating an online shopping website can encompass a range of departments and expertise within an organization.

a) Development Team

- i) front-end Developers.
- ii) Back-end Developers.
- iii) Full-stack Developers.
- iv) Database Administrators.
- v) Devops Engineer.

b) Design and User Experience Team

- i) UI / UX Designers.
- ii) Graphic Designers.
- iii) Interaction Designers.

c) Marketing and Sales Team

- i) Marketing Managers.
- ii) SEO Specialists.
- iii) Content Writers.
- iv) Social Media Managers.
- v) Digital Advertising Specialists.

d) Product Management Team

- i) Product Managers
- ii) Catalog Managers
- iii) Product Content Writers.

e) IT and Infrastructure Team

- i) Network Administrators.
- ii) Security Experts.
- iii) System Administrators.

f) Analytics and Insights Team

i) Data Analytics

ii) Business Intelligence Analysts.

g) Customer Support Team

i) Customer Support Representatives.

ii) Helpdesk Support.

h) Delivery and Order Team

i) Inventory Managers

ii) Shipping and Fulfilment Managers

i) Mobile App Development Team

i) Mobile App Developers

ii) Mobile UI/UX Developers.

2. External Resources:

These resources are often provided by third party vendors or service providers.

a) Web Hosting Provider:

Provides server space and infrastructure to host the website and its data.

b) Domain Name Registrar:

Registers and manages the website's domain name.

c) Content Delivery Network:

Improves website performance by delivering content from servers closer to user's geographic location

- d) Payment Gateway Provider:
facilitates online payments securely, integrating with various payment methods (credit cards, digital wallets, etc.)
- e) E-commerce platform:
Offers pre-built e-commerce solutions with features like inventory management and checkout systems.
- f) Security Solutions:
Provides tools for securing the website such as SSL certificates, firewalls, malware detection.
- g) Analytics and Tracking tools:
Offers tools to collect and analyze website traffic, user behaviour, and conversions.
- h) Email Marketing Service:
facilitates email campaigns, newsletters and customer communication.
- i) Social Media Management Tools:
Helps manage and schedule social media posts and interactions.
- j) Shipping and Fulfillment Partners:
works with logistics companies for order fulfilling and shipping.
- k) Hardware and Network Infrastructure Providers:
Supplies physical hardware and network equipment for supporting the websites backend infrastructure.

FUNCTIONAL REQUIREMENTS

These are specific features and capabilities that a shopping website must have to meet its intended purpose.

1. User Registration and Authentication.
 - i) Create account, log in and recover passwords.
 - ii) Include features like CAPTCHA to prevent bots.
2. Product Catalog:
 - i) Display products in categories with images, description, prices and availability.
 - ii) Product catalog sorting and filtering.
3. Explore and Navigation
 - i) Robust search with auto-suggestions and filters.
 - ii) Clear navigation for easy browsing.
4. Product Details
 - i) Display detailed product information, reviews, specifications.
5. Shopping Cart and Checkout
 - i) Add products to cart.
 - ii) Checkout with multiple payment options.
6. Orders Section:
 - i) View orders, history, cancellation & shipments.
7. User Review and ratings:
 - i) Users to rate and drop reviews.
 - ii) Provide feedback.

8. User Profile and Preferences

- i) Manage profiles, addresses and communication preferences.

9. Wishlists, Promotions and Discounts:

- i) Create Wishlists.
- ii) Apply Promo codes, discounts and special offer.

10. Integrated Social Media:

- i) Share products simultaneously on social media platforms.

11. Secure Transactions

- i) Secure transactions for smooth and safe experience.

12. Inventory Management

- i) Update product availability and avoid over-selling.

13. Integrated Notifications

- i) Send order confirmation emails and notification about order status.

14. Content Management:

- i) Update content, price listing and banners.

15. Multilanguage Support

- i) Support multiple languages and provide localized content based on user preferences.

NON FUNCTIONAL REQUIREMENTS

These define quality and characteristics that website must possess for its performance.

1. Performance and Load Time
 - i) Load Quickly
 - ii) Handle concurrent users without performance degradation.
2. Scalability
 - i) Handle future growth and in terms of user traffic and product inventory.
 - ii) Can be scaled horizontally by adding more servers on demand.
3. Reliability and Availability
 - i) Should have high uptime (99.9%+) to ensure availability at all times.
 - ii) Regularly maintained and updated.
4. Security and Data Protection
 - i) Adhere to industry security standards for handling crucial data (payment credentials).
 - ii) Data Encryption
5. Data Backup and Recovery
 - i) Regular backups of the website's data and configuration should be performed to ensure data recovery in case of failures.

8. Browser Compatibility

- i) Should be compatible with different web browsers and their versions.

7. Mobile Responsiveness

- i) Provide a consistent and functional experience on mobile devices, adapting adeptly to different screen sizes.

8. Error Handling and Reporting

- i) Clear error messages should be displayed in case of any.
- ii) Error log generation.

9. Performance Testing

- i) Regular load and stress testing should be conducted to ensure performance under varying conditions.

10. Third-party Integration

- i) Ensure that third-party services and integrations are stable and do not compromise performance.

MODULES

These are distinct functional components or sections of website that serve specific purposes. Breaking down the website into modules helps in organizing the development process.

a) User Authentication and Account Management

- i) Registration
- ii) Login
- iii) Password Reset
- iv) Profile Management.

b) Product Catalog and Search

- i) Product listings
- ii) Product Details
- iii) Search and filtering
- iv) Product Recommendations

c) Shopping Cart and Checkout

- i) Shopping Cart
- ii) Checkout Process
- iii) Payment Processing
- iv) Order Confirmation

d) User Rating and Review

- i) User Review
- ii) Ratings and feedback

e) User Profiles and Preferences

- i) User Profiles
- ii) Address Book
- iii) Communication Preferences.

f) Wishlist and favourites

- i) Wishlist Management
- ii) favourites list

g) Order Management

- i) Order History
- ii) Order Tracking
- iii) Returns and Exchanges

h) Analytics and Reporting

- i) User Behaviour Tracking
- ii) Sales Performance Reports

i) Customer Support Integration

- i) Live Chat
- ii) Helpdesk Integration

j) Mobile App Configuration

- i) Mobile App features

k) Localization and Multilingual support

- i) Language and currency selection
- ii) Localized content.

l) Inventory Management

- i) Inventory Tracking
- ii) Stock Notifications

m) Third-party Integrations

- i) Payment Gateways
- ii) Shipping Partners.
- iii) Analytics Tools.

n) Admin Dashboard

- i) Product Management
- ii) Order Processing
- iii) Content Moderation.

PROCESS MODEL

Incorporating the PROTOTYPE MODEL.

The prototype model involves creating an initial prototype of the software, which is a preliminary version of the final product that demonstrates its key features and functionalities.

Here's how the model could be helpful:

1. Requirement Gathering: Work closely with stakeholders. Understand their expectations and preferences.
2. Design Prototyping: Create a design prototype. A visual representation/preview of how website will look.
3. Prototype Development: Include core functions. Provide hands-on experience to the stakeholder.
4. User Testing and feedback: Present to stakeholder and gather feedback and improvement suggestions.
5. Iterative Refinement: Refine prototype based on the gathered feedback.
6. ~~Itera~~ Incremental Enhancement: Enhance prototype by adding more modules.
7. Continuous User Validation: Involve users in the validation process to ensure website features.

8. Final Implementation: After prototype has gone under several iterations and stakeholders are satisfied; proceed with final implementation.

The prototype model focus' on creating a tangible representation of software early in the development process.

It allows stakeholders to visualize user interactions, identify potential issues and make informed decisions.

Also promotes collaboration between developers, designers and stakeholders, leading to a website that better meets user requirements and expectations.
