

## Project Design Phase-I

### Proposed Solution Template

Date	22 July 2024
Team ID	SWTID1720760336
Project Name	Project- Book Store - Where Stories Nestle
Maximum Marks	3 Marks

#### Proposed Solution Template:

Project team shall fill the following information in proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	<ul style="list-style-type: none"><li>· Limited accessibility to literature for people with disabilities.</li><li>· High operational costs associated with traditional brick-and-mortar bookstores.</li><li>· Difficulty in finding and ordering books conveniently.</li></ul>
2.	Idea / Solution description	<ul style="list-style-type: none"><li>· Develop a web app for a bookstore that includes features such as screen readers and adjustable font sizes to cater to individuals with disabilities.</li><li>· Enable users to order books easily through the web app.</li><li>· Provide an option for users to read e-books directly within the app.</li><li>· Create a more cost-effective solution by operating a web-based bookstore instead of a traditional physical store.</li></ul>

3.	Novelty / Uniqueness	<ul style="list-style-type: none"> <li>· The bookstore web app prioritizes accessibility features, promoting inclusivity and allowing a wider range of individuals to enjoy reading.</li> <li>· Combines traditional book sales with digital content and modern revenue streams.</li> <li>· Provides a seamless experience for ordering and reading books online.</li> </ul>
4.	Social Impact / Customer Satisfaction	<ul style="list-style-type: none"> <li>· <b>Social Impact:</b> The app makes literature more accessible to people with disabilities, promoting inclusivity.</li> <li>· <b>Customer Satisfaction:</b> The accessibility features, easy ordering process, and the option to read books online contribute to a better reading experience for all users.</li> </ul>

5.	Business Model (Revenue Model)	<p><b>Revenue Streams:</b></p> <p>Book Sales: Selling physical and e-books.</p> <p>E-Book Sales: Providing digital versions of books that can be read within the app.</p> <p>Advertising: Displaying ads within the app.</p> <p>Affiliate Marketing: Earning commissions by promoting other products or services.</p> <p>Premium Memberships: Offering exclusive content or discounts to members.</p> <p><b>Cost Efficiency:</b></p> <p>Reduced overhead costs compared to maintaining a traditional bookstore.</p> <p>Savings on rent, utilities, and physical inventory storage.</p>
6.	Scalability of the Solution	<p>The web app can scale by adding more books and categories.</p> <p>Potential to expand into new markets and regions without the need for physical locations.</p> <p>Ability to integrate additional features and services based on user feedback and technological advancements.</p> <p>The ability to handle an increasing number of users ordering and reading books online.</p>

## Project Planning Phase

### Project Planning Template (Product Backlog, Sprint Planning, Stories, Story points)

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Maximum Marks	4 Marks

### Product Backlog, Sprint Schedule, and Estimation (2 Marks)

Use the below template to create product backlog and sprint schedule

Sprint	Functional	User Story	User Story / Task	Story Points
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	2
Sprint-1	Search Your Book	USN-2	As a user, I can search for books using keywords such as title, author, or genre.	3
Sprint-2	Read Online	USN-3	As a user, I can read e-books directly within the app.	5
Sprint-1	Order Your Book	USN-4	As a user, I can add books to my cart.	3
Sprint-1	View Orders and Cart History	USN-5	As a user, I can view my past orders and cart history.	4
	Dashboard			

**Project Tracker, Velocity & Burndown Chart: (2 Marks)**

Sprint	Total Story	Duration	Sprint Start Date	Sprint End Date	Story Points
Sprint-1	2	2 Days	06 July 2024	07 July 2024	2
Sprint-2	3	3 Days	08 July 2024	12 July 2024	3
Sprint-3	5	5 Days	13 July 2024	16 July 2024	5
Sprint-4	3	3 Days	17 July 2024		3
Sprint-5	4	4 Days	20 July 2024	22 July 2024	4

**Velocity:**

Imagine we have a 17-day sprint duration, and the velocity of the team is 15 (points per sprint).  
Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

## Calculate Velocity

The velocity for each sprint can be defined as:

$$\text{Velocity} = \frac{\text{Total Story Points}}{\text{Number of Sprints}} = \frac{17}{5} = 3.4 \text{ story points/sprint}$$

Therefore, for each sprint:

$$\text{Sprint Duration} = \frac{\text{Total Duration}}{\text{Number of Sprints}} = \frac{17}{5} = 3.4 \text{ days/sprint}$$

So, your Agile Velocity calculation can be confirmed and interpreted correctly within the context of your project as follows:

## Final Calculation

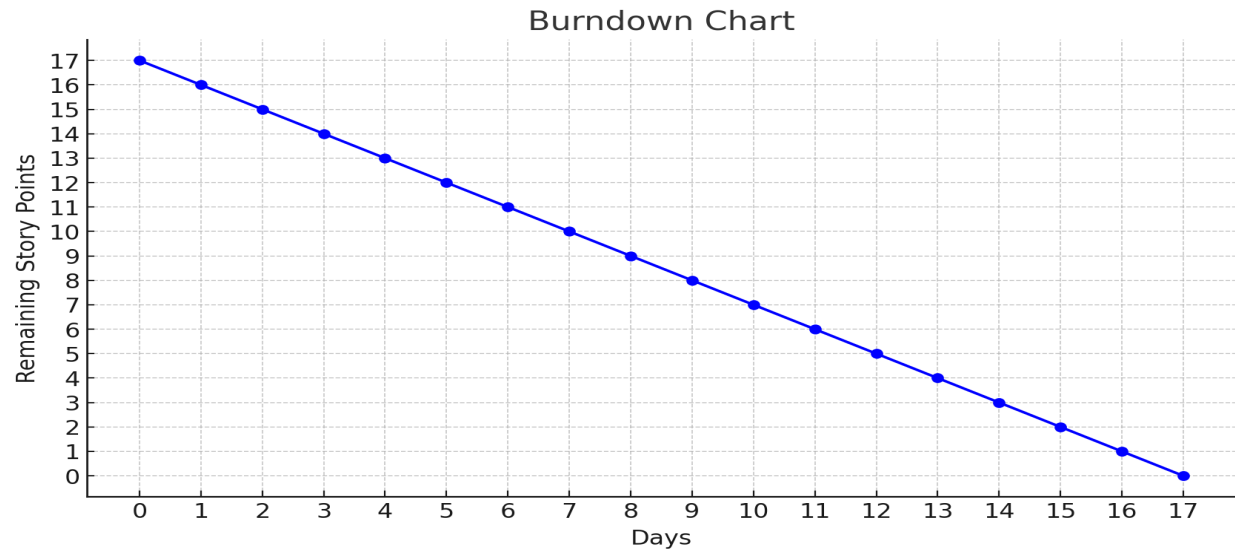
$$\text{Agile Velocity (AV)} = \frac{\text{Total Story Points}}{\text{Total Duration}} = \frac{17}{17} = 1 \text{ story points/day}$$

## Burndown Chart:

A burndown chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies such as Scrum. However, burn down charts can be applied to any project containing measurable progress over time.

<https://www.visual-paradigm.com/scrum/scrum-burndown-chart/>

<https://www.atlassian.com/agile/tutorials/burndown-charts>



**Reference:**

<https://www.atlassian.com/agile/project-management>

<https://www.atlassian.com/agile/tutorials/how-to-do-scrum-with-jira-software>

<https://www.atlassian.com/agile/tutorials/epics>

<https://www.atlassian.com/agile/tutorials/sprints>

<https://www.atlassian.com/agile/project-management/estimation>

<https://www.atlassian.com/agile/tutorials/burndown-charts>

**Ideation Phase**  
**Define the Problem Statements**

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Maximum Marks	3 Marks

### Customer Problem Statement Template:

I am	An avid reader who loves to discover new books but struggles to find recommendations that match my specific interests and preferences.
I'm trying to	Find a personalized and reliable source of book recommendations to make my reading experience more enjoyable and fulfilling.
But	I often get overwhelmed by the sheer number of options available, and many recommendations are too generic or not tailored to my unique tastes.
Because	Current recommendation systems are not sufficiently personalized and fail to capture the nuances of individual reading preferences.
Which makes me feel	Frustrated and discouraged, as I spend too much time searching for books and often end up with unsatisfactory choices.

Reference: <https://miro.com/templates/customer-problem-statement/>

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[With problem Statements](#)



Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	An avid reader who loves to discover new books	Find a personalized and reliable source of book recommendations	I often get overwhelmed by the sheer number of options available	Current recommendation systems are not sufficiently personalized	Frustrated and discouraged
PS-2	A busy professional with limited time	Quickly find new, relevant books to read during my commute	Most recommendations are too generic or not relevant to my specific interests	Bookstores and online platforms lack advanced filtering and personalization tools	Overwhelmed and dissatisfied with the choices available
PS-3	A parent looking for age-appropriate books for my children	Easily find suitable and engaging books for my kids	Many recommendations do not consider the varying reading levels and interests of different ages	Current systems do not adequately cater to the specific needs of children at different developmental stages	Concerned and frustrated by the lack of suitable options
PS-4	A student needing academic resources and references	Source accurate and relevant academic books and materials quickly	The search results often include irrelevant or outdated books	Academic book databases and online bookstores do not offer efficient search functionalities	Anxious and pressured due to the time-consuming search process
PS-5	A casual reader interested in exploring new genres and authors	Discover new and diverse authors and genres	Recommendations often repeat the same popular books and do not introduce lesser-known authors	The recommendation algorithms favor bestsellers and mainstream books	Disappointed and uninspired by the lack of diversity in suggestions

## Requirement Gathering and Analysis Phase Solution Architecture

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Maximum Marks	

## Solution Architecture:

Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. Its goals are to:

- Find the best tech solution to solve existing business problems.
- Describe the structure, characteristics, behavior, and other aspects of the software to project stakeholders.
- Define features, development phases, and solution requirements.
- Provide specifications according to which the solution is defined, managed, and delivered.

## Example - Solution Architecture Diagram:

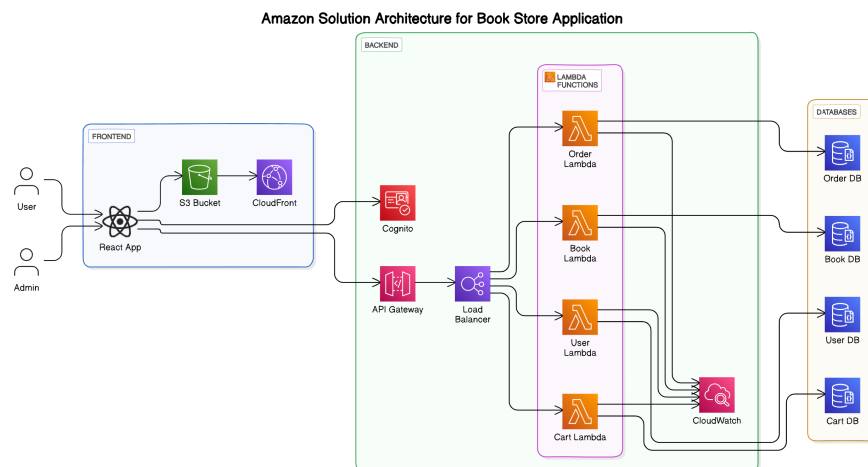


Figure 1: Architecture and data flow of the Book Store application

Reference: [https://www.researchgate.net/publication/353332514\\_Digital\\_Bookstore](https://www.researchgate.net/publication/353332514_Digital_Bookstore)

## Requirement Gathering and Analysis Phase Solution Requirements (Functional & Non-functional)

Date	22 July 2024
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Maximum Marks	

### Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Site
FR-2	User Confirmation	Confirmation via Email Confirmation via Password
FR-3	User Authentication	Login with Email and Password
FR-4	User Profile Management	View Profile Edit Profile
FR-5	Product Catalog	Browse Products Search Products
FR-6	Product Details	View Product Details
FR-7	Shopping Cart	Add Products to Cart View Cart Update Cart (Change Quantity, Remove Items)
FR-8	Checkout and Payment	Enter Shipping Information Choose Payment Method Order Summarisation
FR-9	Order Management	View Order History View Order Details Cancel Order
FR-10	Admin Product Management	Add New Products Edit Existing Products Delete Products
FR-11	Admin Order Management	View All Orders Update Order Status
FR-12	Admin User Management	View All Users Edit User Details Delete Users
FR-13	Security	Role-Based Access Control Data Encryption

FR-17	Wishlist	Add Products to Wishlist View Wishlist Remove Products from Wishlist
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### Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	<b>Usability</b>	The React-based front end should provide an intuitive and responsive user interface, ensuring ease of use and a smooth user experience across various devices and screen sizes. It should follow best practices in web design and accessibility standards to cater to a diverse user base, including those with disabilities.
NFR-2	<b>Security</b>	Utilizing AWS's security features, the application must ensure data protection through secure communication protocols (e.g., HTTPS), encryption of sensitive data at rest and in transit (e.g., using AWS KMS for encryption keys), and secure authentication mechanisms (e.g., AWS Cognito). The system should protect against common web vulnerabilities such as SQL injection, XSS, and CSRF. Role-based access control should be implemented to restrict access to sensitive administrative functions.

NFR-3	<b>Reliability</b>	<p>The application should leverage AWS's infrastructure to ensure high reliability, including the use of multiple availability zones for MongoDB to prevent data loss and maintain data integrity. The system should handle errors gracefully and include mechanisms for automatic backup and recovery, utilizing AWS Backup services for regular backups and automated recovery procedures.</p>
NFR-4	<b>Performance</b>	<p>The application should provide a fast and responsive user experience, with optimized page load times and server response times. AWS services like CloudFront for content delivery and EC2 instances for scalable compute power should be utilized to handle a large number of concurrent users and transactions efficiently. Performance metrics should be monitored using AWS CloudWatch to ensure they remain within acceptable thresholds.</p>
NFR-5	<b>Availability</b>	<p>High availability should be ensured using AWS's infrastructure, with features like auto-scaling groups for handling traffic spikes, and multi-region deployments for failover and disaster recovery. The application should be accessible to users 24/7 with minimal downtime, utilizing AWS services for redundancy and failover mechanisms. Scheduled maintenance should be conducted with minimal disruption to users, leveraging rolling updates and blue/green deployment strategies.</p>

NFR-6	Scalability	The application should be designed to scale horizontally and vertically, leveraging AWS's scalable infrastructure. MongoDB on AWS should be configured to handle increasing data volumes and user loads using sharding and replica sets. The application should support auto-scaling for both the web servers and the database, ensuring it can handle increased demand seamlessly. The architecture should allow for easy addition of new features and functionalities without significant rework.
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### Requirement Gathering and Analysis Phase Technology Stack (Architecture & Stack)

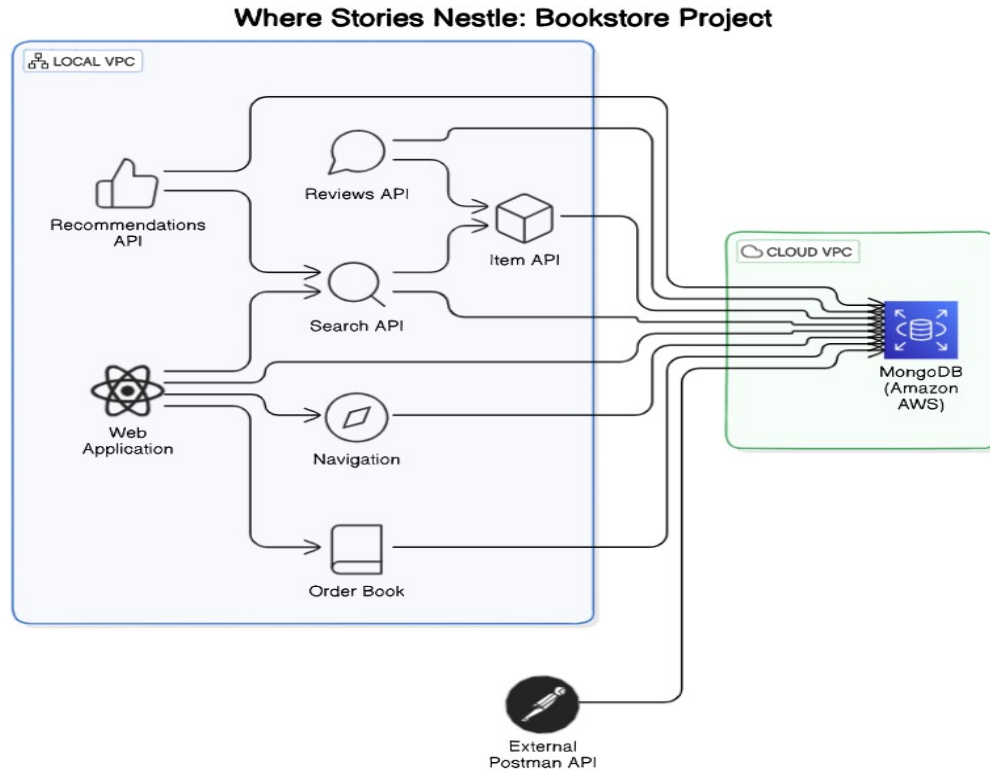
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#### Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

**Example: Order processing during pandemics for offline mode**

**Reference:** <https://developer.ibm.com/patterns/ai-powered-backend-system-for-order-processing-during-pandemics/>



**Table-1 : Components & Technologies:**

S	Component	Description	Technology
	User Interface	How users interact with the application through web or mobile platforms.	HTML, CSS, JavaScript / React.js
	Application Logic-1	Handles specific processes within the application, enabling backend operations.	Node.js
	Application Logic-2	Manages routing and server-side logic to ensure smooth data flow and communication.	Express.js
	Database	Stores and manages data types and configurations for the application.	MongoDB
	Cloud Database	Provides scalable database services hosted in the cloud.	MongoDB Atlas
	File Storage	Handles storage needs for files, both locally and in the cloud.	Local Filesystem, Cloud Storage
	External API-1	Purpose of External API used in the application	Postman
	Infrastructure (Server / Cloud)	Deploys the application either locally or on the cloud for scalability and management	Local, Cloud Foundry

**Table-2: Application Characteristics:**

S.No	Characteristics	Description	Techno
1.	Open-Source Frameworks	Utilizes open-source technologies to build the	MERN S
2.	Availability	Ensures the application is highly available through	Load Bal
3.	Performance	Enhances performance using caching mechanisms	Caching

**References:**

<https://c4model.com/>

<https://developer.ibm.com/patterns/online-order-processing-system-during-pandemic/>

<https://www.ibm.com/cloud/architecture>

<https://aws.amazon.com/architecture>

<https://medium.com/the-internal-startup/how-to-draw-useful-technical-architecture-diagrams-2d20c9fda90d>

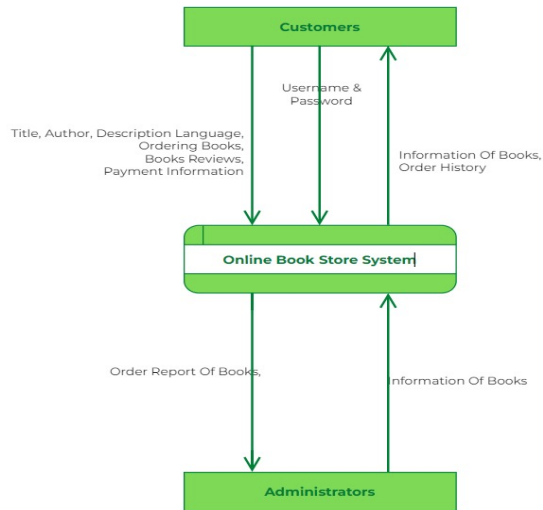
**Requirement Gathering and Analysis Phase  
Data Flow Diagram & User Stories**

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Maximum Marks	

**Data Flow Diagrams:**

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.





## User Stories

Use the below template to list all the user stories for the product.

User	Functional	User	User Story / Task	Acceptance criteria
Customer	Registration	USN-1	As a user, I can register for the application by entering my email,	I can access my account / dashboard
		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click on the link
		USN-3	As a user, I can register for the application through Facebook	I can register & access the dashboard with Facebook Login
		USN-4	As a user, I can register for the application through Gmail	I can register and access the dashboard with Gmail Login
	Login	USN-5	As a user, I can log into the application by entering email & password	I can access my account/dashboard after logging in
	View Book Details	USN-6	As a user, I can read a summary of the book.	I can view the book summary on the book detail page
	Order Book	USN-7	As a user, I can order a book.	I can add a book to my cart and place an order
	View Cart	USN-8	As a user, I can view my cart, including the list of books and their prices	I can see the items and prices in my cart
	Order Details	USN-9	As a user, I can see details of my order, including price and	I can view the order summary and shipping details
Customer	Registration	USW-1	As a web user, I can register by entering my email, password,	I can access my account/dashboard

	Login	USW-2	As a web user, I can log into the application using email and password.	I can access my account/dashboard after logging in
	View Book Details	USW-3	As a web user, I can read a summary of the book.	I can view the book summary on the book detail page
	Order Book	USW-4	As a web user, I can order a book.	I can add a book to my cart and place an order
		USW-5	As a web user, I can view my cart, including the list of books	I can see the items and prices in my cart
	Order Details	USW-6	As a web user, I can see details of my order, including price and shipping	I can view the order summary and shipping details
	Manage User Queries	UCE-1	As a customer care executive, I can view and manage user queries	I can see, respond to, and close user queries
	Update Book Information	UCE-2	As a customer care executive, I can update book information in the system	I can modify book details like title, author, price
Administrator	Manage Users	ADM-1	As an administrator, I can create, delete, or deactivate users	I can manage user accounts and access levels
	Manage Book Inventory	ADM-2	As an administrator, I can add, update, or remove books from the system	I can manage the book inventory effectively
	Generate Reports	ADM-3	As an administrator, I can generate reports on sales, user activity, and book inventory	I can access and download various reports