

CAPSTONE PROJECT (PART-3)

Online Agriculture Products Store Project

Introduction:

This case study revolves around a Corporate Social Responsibility (CSR) initiative taken by Mr. Henry, a successful businessman who wanted to give back to society by helping farmers from remote areas. After a casual conversation with his childhood friends Peter, Kevin, and Ben—who are farmers—Mr. Henry became aware of the challenges they face in procuring essential agricultural products like fertilizers, seeds, and pesticides. These problems highlighted a gap in the agricultural supply chain, especially in rural areas where access to quality products is limited.

To address this issue, Mr. Henry proposed the idea of building an Online Agriculture Products Store, which would serve as a digital platform enabling direct communication between farmers and manufacturing companies. Through this platform, farmers would be able to browse and purchase required products conveniently from their mobile devices or computers.

The project is funded by Mr. Henry's company, SOONY, with a budget of ₹2 Crores and a planned duration of 18 months. The project is being executed by APT IT SOLUTIONS, a technology company selected for their skilled talent pool and relevant experience. A dedicated team comprising developers, testers, network and database admins, along with project managers and business analysts, has been formed to bring this idea to life.

The main goal of this initiative is to simplify access to essential agricultural inputs for farmers and contribute to their growth and productivity. The project not only has commercial potential but also a strong social impact, making it a significant example of how technology can be used to solve real-world problems.

Team Overview:

For the successful execution of the Online Agriculture Products Store project, a collaborative team structure has been established, involving various stakeholders, technical experts, and support roles from both the client and service provider sides.

Below is the breakdown of the team involved in the project:

Client Side (SOONY Company)

- **Mr. Henry** – He is the initiator of the project and also one of the wealthiest businessmen in the city. He came up with this idea as part of a CSR initiative to help remote farmers, including his childhood friends.
- **Mr. Pandu** – Financial Head at SOONY. He is responsible for overseeing the financial management and budget allocation for the project.
- **Mr. Dooku** – Project Coordinator from SOONY. He is involved in supervising the project progress and coordination from the client's side.
- **Committee Members** – Mr. Henry, Mr. Pandu, and Mr. Dooku form a decision-making committee for this project.
- **Stakeholder Farmers** – Peter, Kevin, and Ben (friends of Mr. Henry) are farmers from a remote village and are acting as key stakeholders. They are actively involved in sharing requirements and feedback based on actual farming needs.

Vendor Side (APT IT SOLUTIONS)

APT IT SOLUTIONS was selected as the execution partner for this CSR project. The team structure from their side includes:

- **Mr. Karthik** – Delivery Head. He played an important role in bagging the project for APT IT SOLUTIONS through his professional network and will oversee overall delivery.
- **Mr. Vandanam** – Project Manager. He is responsible for planning, execution, and ensuring the project is completed within budget and timeline.
- **Ms. Juhi** – Senior Java Developer. She leads the technical development efforts and helps guide junior developers.
- **Java Developers** – Mr. Teyson, Ms. Lucie, Mr. Tucker, and Mr. Bravo are part of the Java development team working on core features of the application.
- **Mr. Mike** – Network Administrator. He handles networking and infrastructure-related aspects to support the application.
- **Mr. John** – Database Administrator. He is in charge of designing and managing the project's database.
- **Mr. Jason and Ms. Alekya** – QA Testers. They are responsible for testing the application and ensuring its quality before deployment.
- **My Role – Business Analyst (BA)** – I have joined this project as the Business Analyst. I'm responsible for gathering and analyzing requirements from stakeholders, preparing

documentation like SRS and use cases, and ensuring the developed solution meets the business needs.

Question 1: Functional and Non functional Requirements.

- **Functional Requirements (FRs):**

Functional requirements describe *what the system must do*. They define specific behaviors, services, and functions of the system to meet the business needs. According to BABOK v3, functional requirements represent the capabilities or conditions that a solution must have in order to satisfy stakeholder requirements.

Example: “The system shall allow farmers to search for products by keyword.”

Functional requirements can be grouped based on the nature of functionality:

1. **Business Rules**

- Rules or constraints that govern business operations.
- Example: “Farmers must create an account before placing an order.”

2. **Transaction Requirements**

- Define how transactions are processed.
- Example: “The system shall process payments using UPI, COD, and cards.”

3. **Data Requirements**

- Define how data is captured, stored, updated, or retrieved.
- Example: “The system shall allow manufacturers to upload product details (name, price, stock).”

4. **Reporting Requirements**

- Specify the kind of reports or analytics to be generated.
- Example: “The system shall provide farmers with a purchase history report.”

5. **Interface Requirements**

- Define interactions between the system and external systems, or between modules.

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- Example: “The system shall integrate with logistics software to track delivery.”

Req ID	Req Name	Req Description	Priority
FR001	User Registration	The system shall allow farmers and manufacturers to register with email and password.	High
FR002	User Login	The system shall authenticate users via secure login.	High
FR003	Product Catalog	The system shall display categorized products (Seeds, Fertilizers, Pesticides).	High
FR004	Product Search	The system shall allow users to search for products using keywords.	High
FR005	Add to Cart	The system shall allow users to add products to a shopping cart or save for later.	High
FR006	Checkout & Payment	The system shall support COD, UPI, and Credit/Debit Card payments.	High
FR007	Order Tracking	The system shall allow farmers to track delivery status of orders.	High
FR008	Order Confirmation	The system shall send confirmation emails to users after order placement.	Medium
FR009	Product Upload	The system shall allow manufacturers to upload and manage product listings.	High
FR010	Feedback & Rating	The system shall allow farmers to submit product ratings and reviews.	Medium

- **Non-Functional Requirements (NFRs):**

Non-functional requirements describe *how the system performs a function*. They define quality attributes such as performance, reliability, usability, scalability, and security. According to BABOK v3, non-functional requirements are constraints or conditions that describe the qualities of the system, not its behavior.

Example: “The system shall support up to 5,000 concurrent users with a response time of less than 3 seconds.”

NFRs are usually grouped into **quality attributes** and **constraints**:

1. **Performance Requirements**

- Speed, response time, throughput.
- Example: “Page load time shall not exceed 3 seconds.”

2. **Scalability Requirements**

- How well the system can handle growth in users, transactions, or data.
- Example: “The system shall scale up to 10,000 users.”

3. **Reliability Requirements**

- Availability, fault tolerance, error recovery.
- Example: “System uptime shall be at least 99.5%.”

4. **Usability Requirements**

- Ease of use, accessibility, mobile friendliness.
- Example: “The system shall be accessible with WCAG 2.0 compliance.”

5. **Security Requirements**

- Authentication, authorization, encryption, data privacy.
- Example: “The system shall encrypt passwords using SHA-256.”

6. **Maintainability Requirements**

- Ease of system updates, bug fixes, modularity.
- Example: “Code shall follow standard naming conventions for maintainability.”

7. Portability Requirements

- Ability to run on different environments (OS, browsers, devices).
- Example: “System shall run on Android, iOS, and web browsers.”

8. Compliance Requirements

- Legal, regulatory, or organizational standards.
- Example: “The system shall comply with the Indian IT Act and GDPR.”

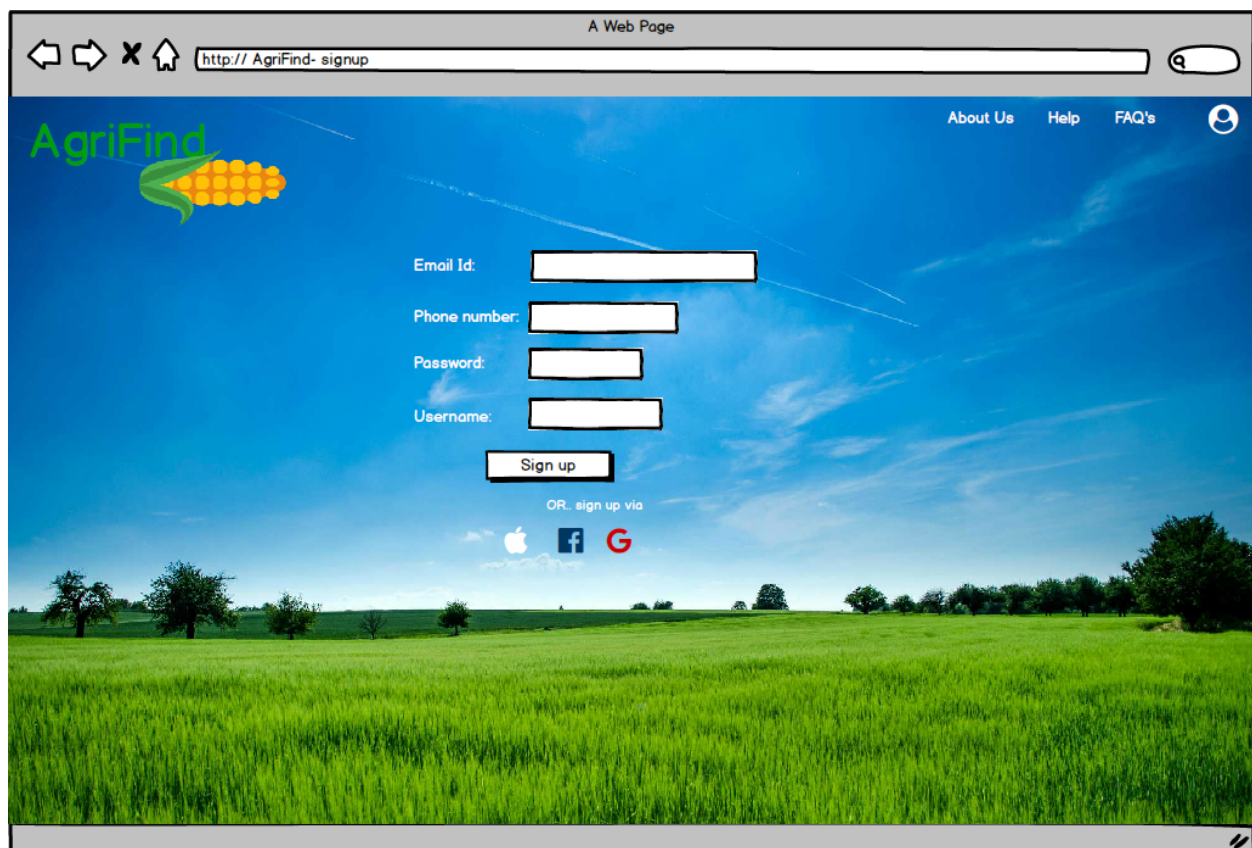
Req ID	Req Name	Req Description	Priority
NFR001	Performance	The system shall respond to user requests within 3 seconds under normal load.	High
NFR002	Scalability	The system shall support at least 10,000 concurrent users.	High
NFR003	Availability	The system shall have an uptime of 99.5% per month.	High
NFR004	Security	The system shall use HTTPS encryption and secure login protocols.	High
NFR005	Usability	The interface shall be intuitive and mobile-friendly for farmers in rural areas.	High
NFR006	Maintainability	The system shall allow modular updates without affecting existing features.	Medium
NFR007	Reliability	The system shall ensure that orders are processed without duplication or loss.	High
NFR008	Data Backup & Recovery	The system shall perform automatic backups daily with recovery time < 2 hours.	Medium
NFR009	Localization	The system shall support multiple local languages for farmers.	Medium

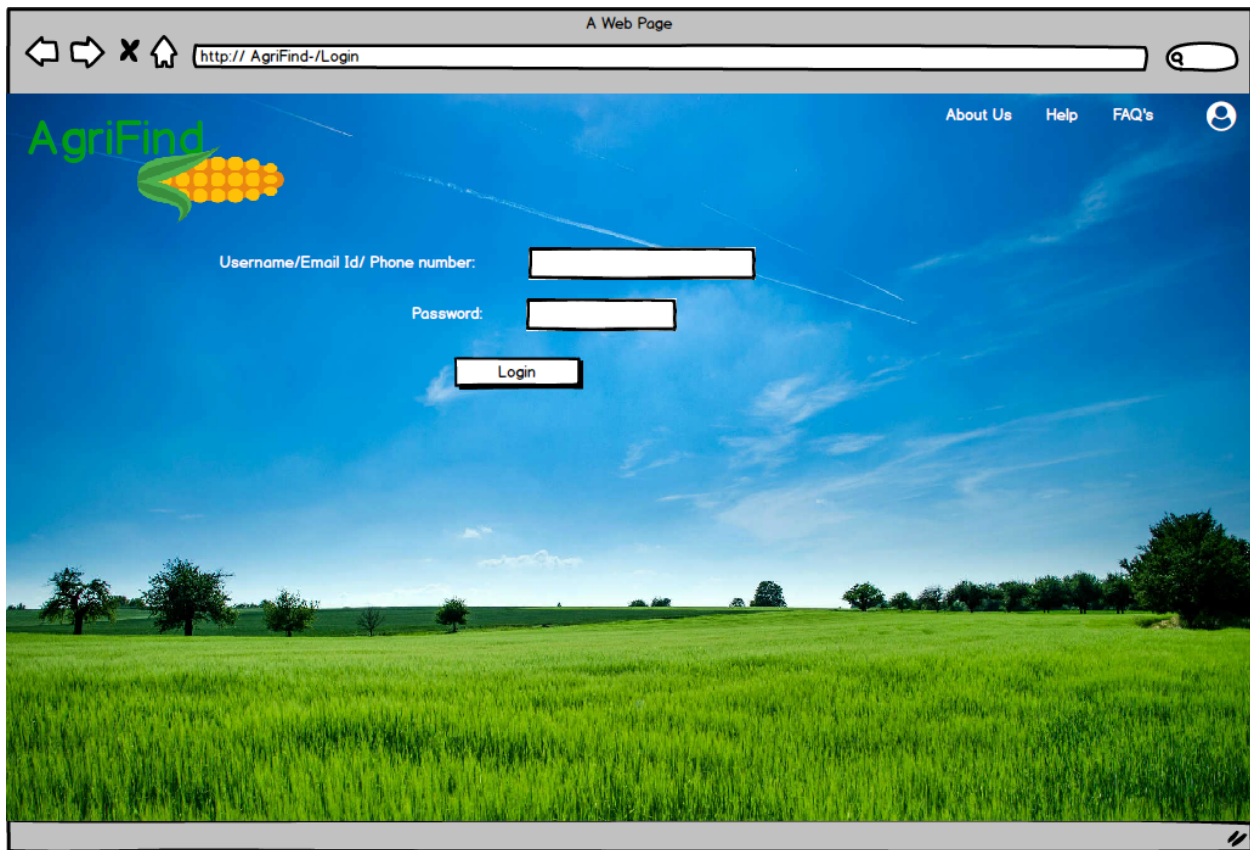
NFR010	Compliance	The system shall comply with data protection and e-commerce regulations.	High
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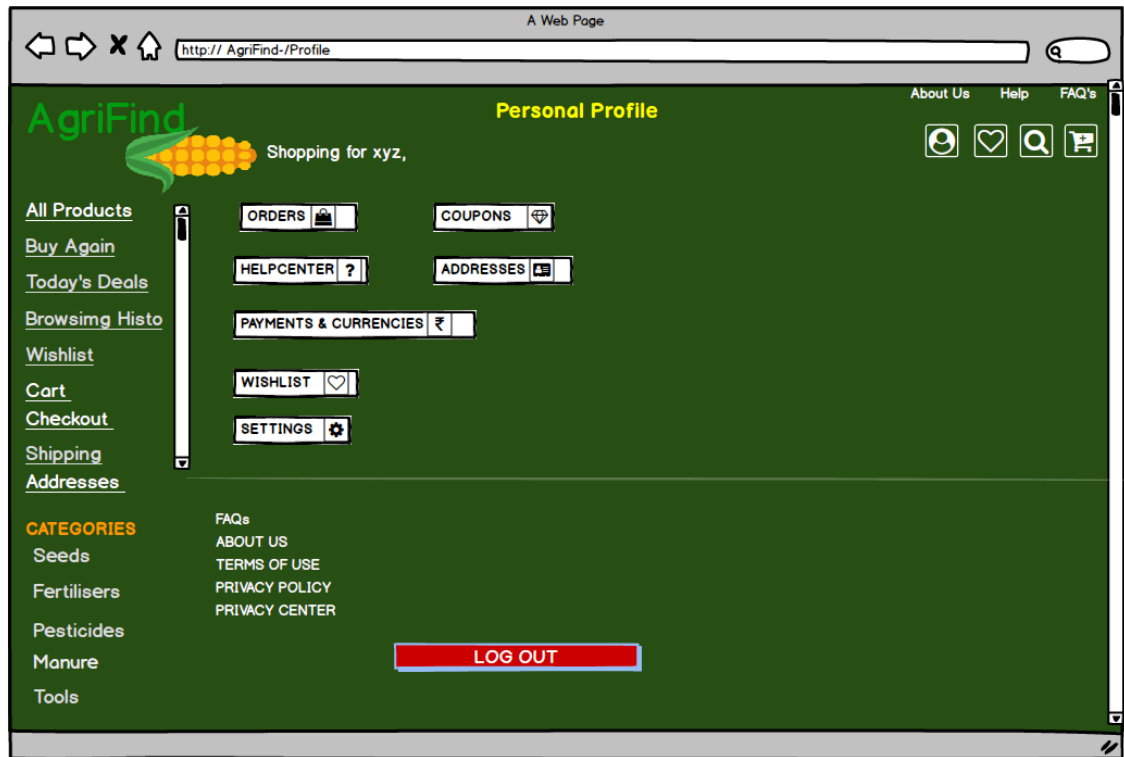
Question 2: Make wireframe and prototypes. (5 page designs min.)

A **wireframe** is a low-fidelity visual representation of a user interface that shows the layout, structure, and elements of a page without focusing on design details such as color, typography, or branding. In BABOK v3, wireframes fall under **Requirements and Design Models** and are categorized as **user interface models**, helping stakeholders visualize functionality before development begins.

A **prototype** is an interactive or semi-interactive model of the system that demonstrates how users will interact with the application. Unlike static wireframes, prototypes allow simulation of navigation and workflows. According to BABOK v3, prototypes are useful for **requirements validation, stakeholder communication, and usability testing**.









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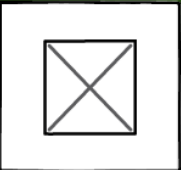
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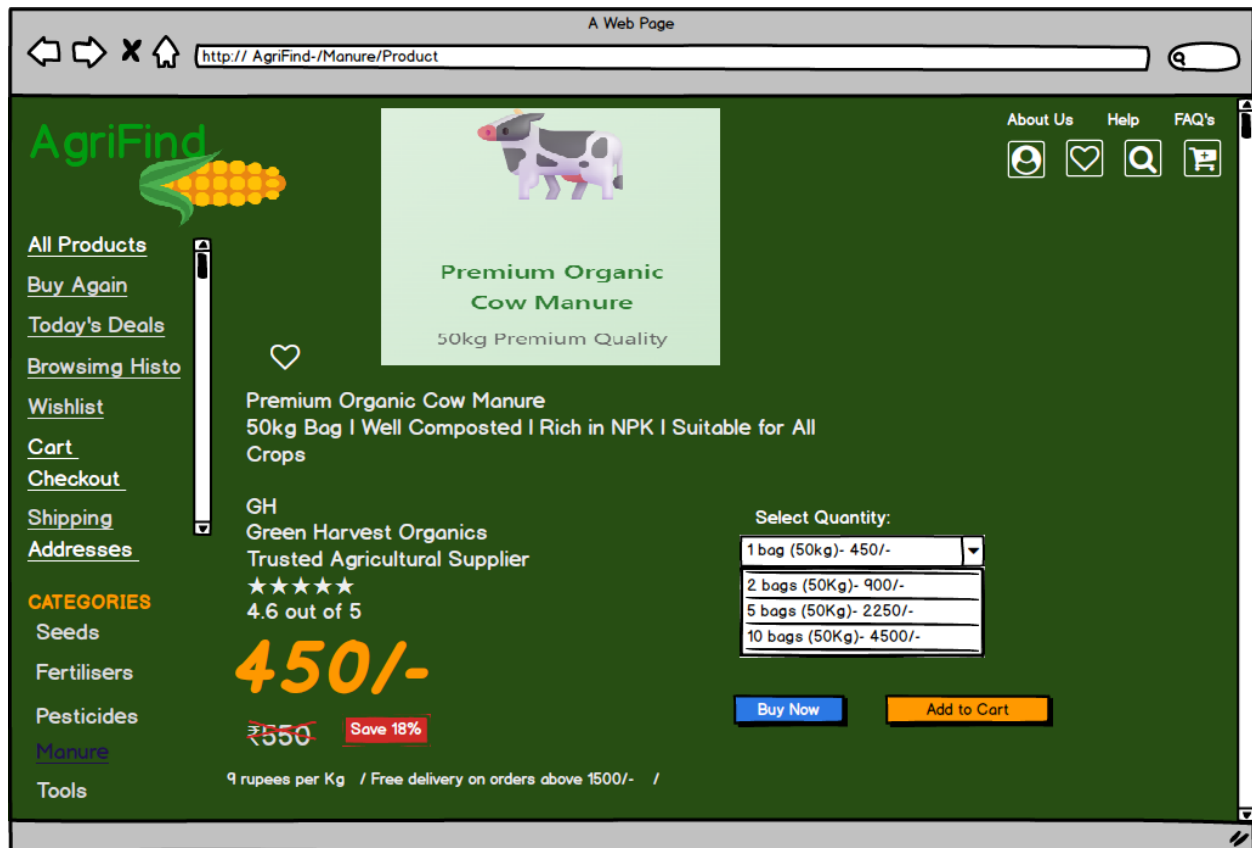
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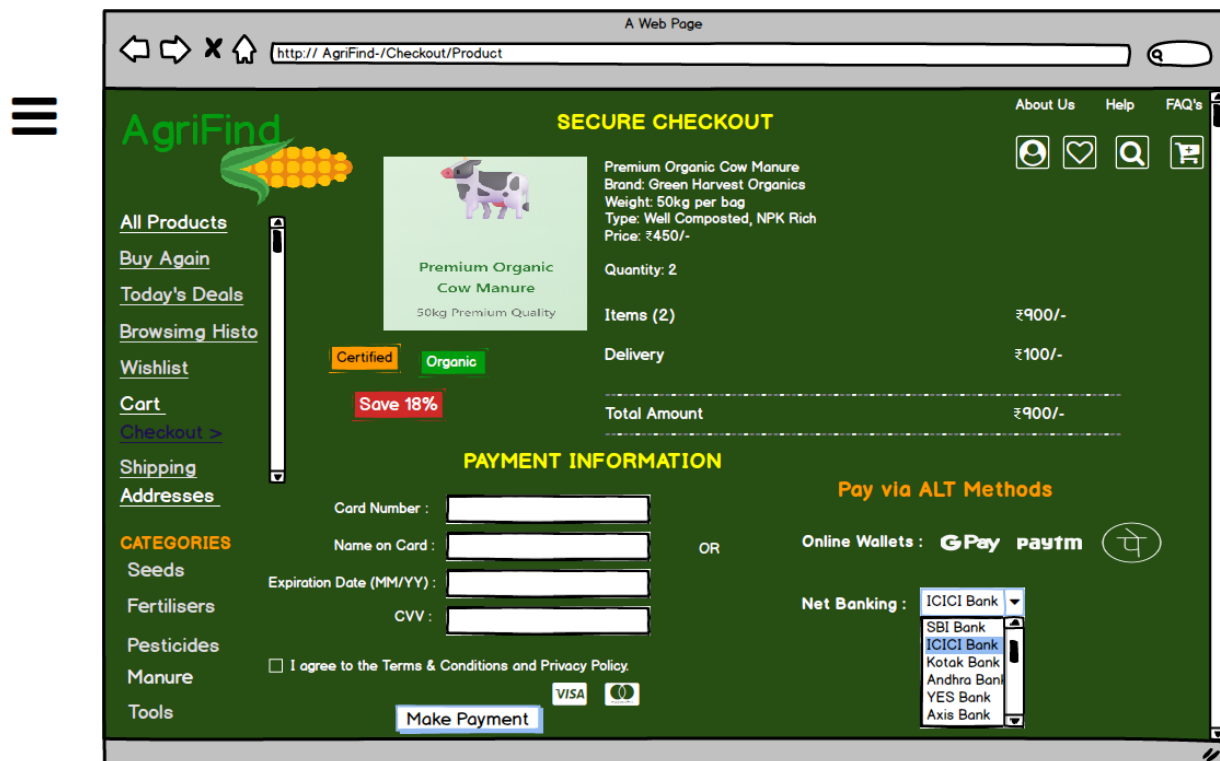
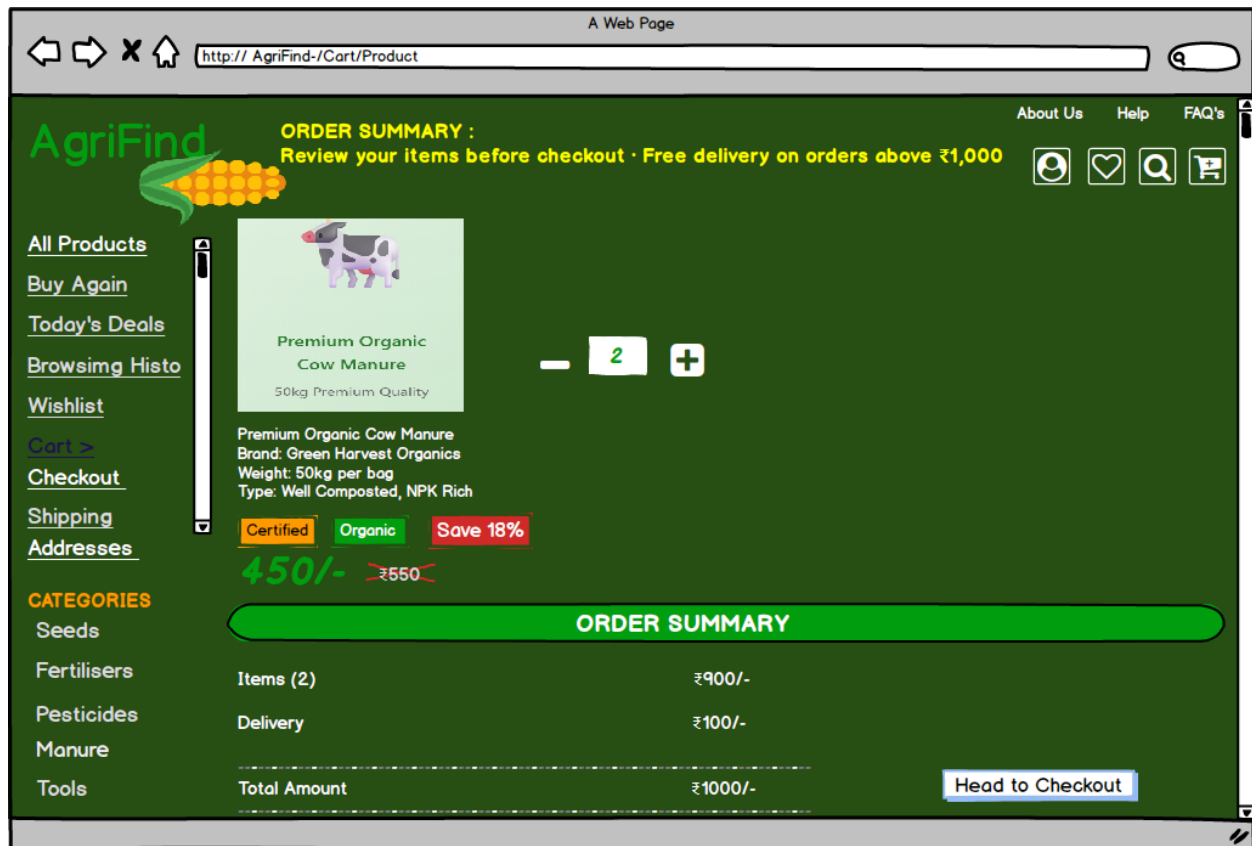
CATEGORIES
Seeds
Fertilisers
Pesticides
Manure
Tools

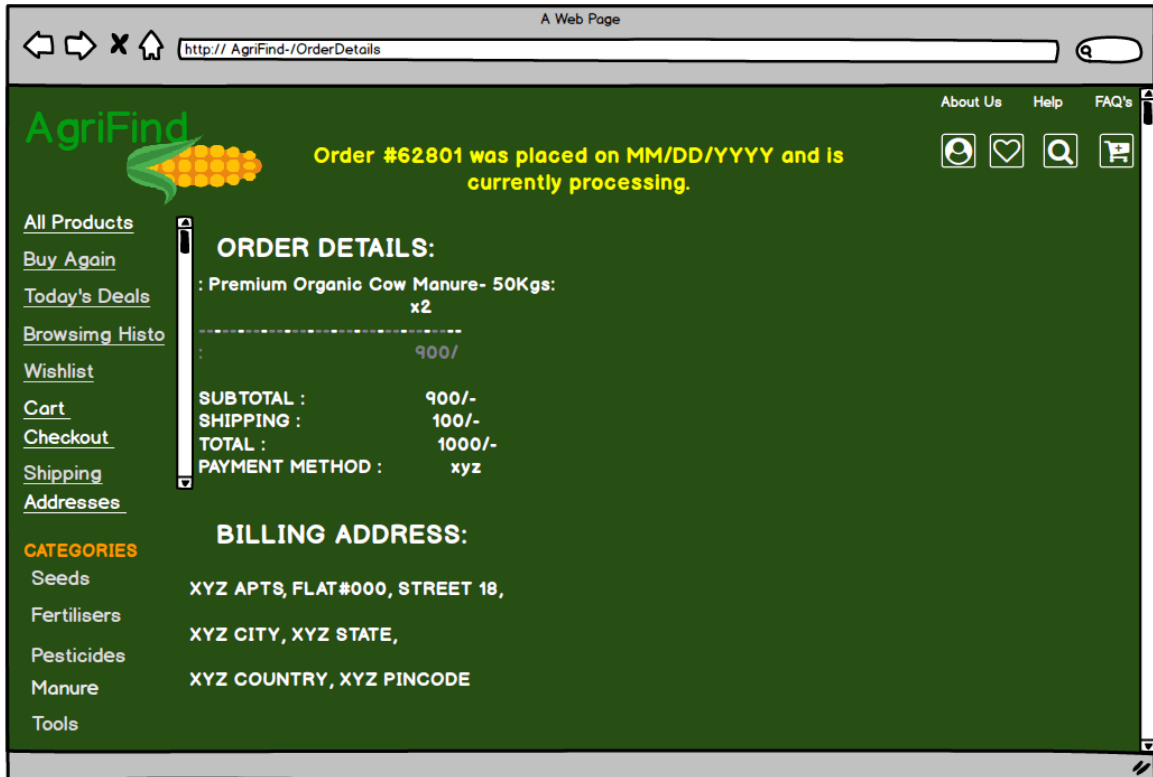
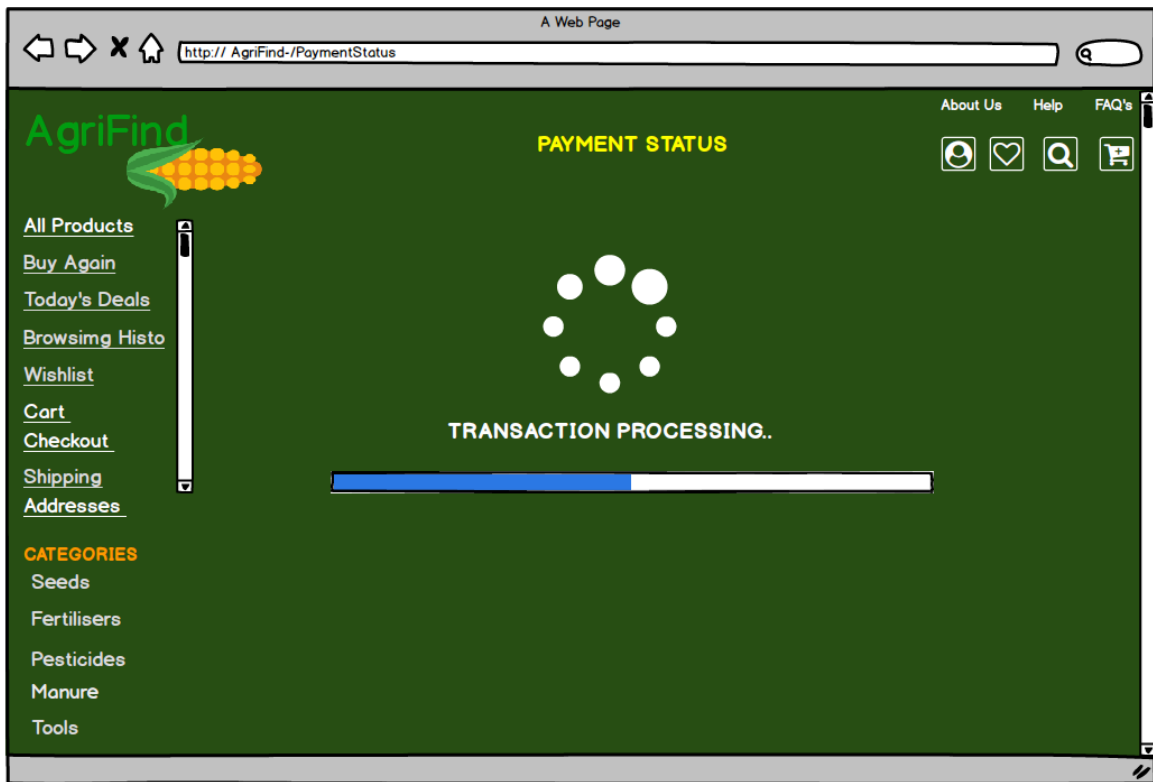

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Question 3: Make a note of the Tools, which you are using for above concepts. Tools (Visio, Balsamiq)

I used Balsamiq for creating my wireframes, mockups and low fidelity prototypes.

Balsamiq is a **low-fidelity, rapid prototyping and wireframing tool** used to create visual **models** of a solution's user interface (UI) and user experience (UX). It serves as a medium for representing requirements in a graphical format, specifically a type of **conceptual model**.

Its primary purpose is to facilitate **requirements analysis and design definition**. The hand-drawn, "sketchy" aesthetic is a deliberate feature designed to focus conversations on the functional requirements and information architecture of a solution, rather than on cosmetic details, which aligns with the BABOK's emphasis on distinguishing between requirements and design.

Balsamiq's application supports several key tasks and techniques described in the BABOK Guide:

1. **Elicitation and Collaboration:** Balsamiq is used to create quick mockups during **workshops, interviews, or prototyping sessions**. Its visual nature allows for a shared understanding of a proposed solution, serving as a powerful communication tool to elicit stakeholder feedback and identify requirements.
2. **Requirements Analysis and Design Definition:** It is a core tool for the **Model Requirements** and **Define Design Options** tasks. A business analyst can use Balsamiq to:
 - **Create Wireframes:** Visual representations of a web page or application screen, showing the layout of content and key UI elements.
 - **Develop Storyboards:** Sequences of wireframes that illustrate the user's interaction flow and experience through the system.
 - **Document UI Requirements:** The wireframes can be annotated to capture detailed functional and non-functional requirements.
3. **Requirements Life Cycle Management:** The mockups created in Balsamiq serve as a tangible output for **validating requirements** with stakeholders. They provide a clear visual artifact for confirmation that the solution design meets the stated business and stakeholder needs.
4. **Solution Evaluation:** By simulating the user experience, Balsamiq prototypes can be used in a preliminary manner to perform **solution evaluation**, identifying potential usability issues or design flaws before any code is written.

The following are the **good aspects** of Balsamiq from a business analysis standpoint:

Low Fidelity and Speed: This is its most significant advantage. Its sketch-like appearance manages stakeholder expectations by signaling that the design is a preliminary concept, not a final product. This encourages critical feedback on core functionality and prevents getting sidetracked by aesthetics. This directly supports the BABOK's focus on **avoiding premature design decisions**.

1. **Simplicity and Ease of Use:** Balsamiq's intuitive drag-and-drop interface requires minimal training. This enables business analysts, subject matter experts, and other non-technical stakeholders to actively participate in the design process, which is a cornerstone of **collaborative business analysis**.
2. **Focus on Functionality:** By abstracting away visual styling, Balsamiq forces the design conversation to concentrate on what the system will *do* and how a user will *interact* with it. This helps ensure that the final product is both usable and meets the business objectives, which is a primary goal of business analysis.
3. **Cost-Effectiveness:** As a dedicated, specialized tool, Balsamiq provides a low-cost, high-value way to generate effective visual requirements without the complexity of more advanced design software. This supports the business analysis principle of **achieving value**.

Question 4: RTM.

According to BABOK v3, a **Requirements Traceability Matrix** (RTM) is a tool used to ensure that all requirements defined for a system are tested and validated. It establishes a clear mapping between requirements and their corresponding design, development, and testing activities. This helps Business Analysts track requirement coverage, manage changes, and ensure no requirement is missed.

For this project, since Mr. Henry (the sponsor) and Peter (a key stakeholder and end-user) want to know the current status, the RTM acts as a status-tracking and communication tool, showing how each requirement is being addressed across different project phases — Design, Development Cycles (D1–D4), Testing Cycles (T1–T4), and UAT.

Req ID	Req Name	Req Description	Design	D 1	T1	D 2	T2	D 3	T3	D 4	T4	UAT
FR001	Product Catalog Browsing	Farmers shall be able to browse all available categories (seeds, fertilizers, pesticides).	✓	✓	✓							✓
FR002	Product Search	Farmers shall be able to search products using keywords.	✓	✓	✓							✓
FR003	User Registration/Login	Farmers and manufacturers shall log in or register with email & password.	✓	✓	✓							✓
FR004	Add to Cart & Buy Later	Farmers shall add products to cart or save for later purchase.	✓			✓	✓					✓
FR005	Secure Payment Gateway	The system shall support COD, Credit/Debit, and UPI payments.	✓			✓	✓					✓
FR006	Order Confirmation Email	Farmers shall receive email confirmation after placing an order.	✓					✓	✓			✓
FR007	Delivery Tracking	Farmers shall track order delivery status in real-time.	✓					✓	✓			✓
FR008	Product Upload (Mfg.)	Manufacturers shall upload and manage their product listings.	✓			✓	✓					✓
FR009	Admin Dashboard	Admin shall manage users, catalog, and monitor transactions.	✓					✓	✓			✓
FR010	Feedback & Ratings	Farmers shall provide feedback and rate purchased products.	✓							✓	✓	✓

Req ID	Req Name	Req Description	Design	D 1	T1	D 2	T2	D 3	T3	D 4	T4	UAT
NFR001	Performance	The system shall handle up to 1,000 concurrent users without slowdown.	✓	✓	✓							✓
NFR002	Availability	The platform shall maintain 99.9% uptime excluding planned maintenance.	✓		✓			✓	✓			✓
NFR003	Scalability	The system shall scale horizontally to accommodate future user growth.	✓			✓	✓					✓
NFR004	Security	All transactions shall use SSL encryption with secure authentication protocols.	✓	✓	✓			✓	✓			✓
NFR005	Usability	The UI shall support multilingual access and intuitive navigation.	✓		✓	✓	✓					✓
NFR006	Reliability	The system shall recover from server crashes within 5 minutes.	✓		✓			✓	✓			✓

NFR007	Maintainability	The codebase shall follow modular architecture to enable easier bug fixing.	✓	✓	✓		✓	✓			✓
NFR008	Compatibility	The application shall be compatible with Chrome, Firefox, Edge, and Safari.	✓		✓	✓	✓				✓
NFR009	Auditability	All user and admin actions shall be logged for 1 year for compliance checks.	✓		✓		✓	✓			✓
NFR010	Accessibility	The platform shall comply with WCAG 2.1 standards for differently-abled users.	✓			✓	✓				✓

How this tackles Mr. Henry & Peter's concerns:

- The RTM shows **traceability** from requirements through design, dev, testing, and UAT.
- They can see that requirements like **catalog browsing, search, and login** are already progressing in **D1 & T1**, while features like **delivery tracking and feedback** are planned for later cycles.
- It reassures stakeholders that **nothing is missed** and that requirements are delivered systematically.

Question 5: Test Case Documents. (write any 10)

A **Test Case Document** is a structured set of conditions, inputs, steps, and expected results created to validate whether a system, module, or feature meets its specified requirements. Each test case ensures that both **functional** and **non-functional requirements** are correctly implemented.

According to **BABOK v3**, test cases are derived from **requirements and acceptance criteria** and are used during **verification and validation** phases.

A well-structured Test Case Document usually includes:

- Test Case ID** – Unique identifier.
- Test Case Name** – Short title describing what's being tested.
- Requirement ID** – Links back to RTM for traceability.
- Pre-Conditions** – What must exist before test execution.

- E. **Test Steps** – Step-by-step instructions.
- F. **Test Data** – Input values used.
- G. **Expected Result** – Anticipated output from the system.
- H. **Actual Result** – Documented during execution.
- I. **Status** – Pass/Fail based on actual vs. expected.
- J. **Priority/Severity** – Impact level if the test fails.

Test Case ID	Test Case Name	Req ID	Pre-Conditions	Test Steps	Expected Result	Test Data	Priority
TC001	User Registration	FR001	User not registered	Navigate to Register → Enter Email/ Ph No. → Set Pwd/ Enter otp → Submit	New account created, confirmation email sent	Email: test@farm.com , Pwd: Test123	High
TC002	User Login	FR001	User registered	Navigate to Login → Enter Email or Ph No./Pwd → Submit	User successfully logs in	Email: test@farm.com , Pwd: Test123	High
TC003	Browse Catalog	FR002	User logged in	Open Catalog → Select Fertilizers	Product list displayed under Fertilizers	N/A	High
TC004	Search Product	FR003	Catalog loaded	Enter keyword → Click Search	Matching products displayed	"Organic Seeds"	High
TC005	Add to Cart	FR004	User logged in	Select Product → Add to Cart	Product added to Cart	Product: "Urea Fertilizer"	Medium
TC006	Payment Gateway	FR005	Product in Cart	Proceed to Checkout → Select Payment → Confirm	Payment successful, order ID generated	Mode: UPI	High
TC007	Order Confirmation Email	FR009	Order placed	Place Order	Email confirmation sent to registered email	Order ID 1234	Medium
TC008	Order Tracking	FR007	Order placed	Navigate to Orders → Track Delivery	Delivery status displayed (e.g., Shipped)	Order ID 1234	Medium
TC009	Manufacturer Product	FR008	Manufacturer	Navigate → Upload	Product visible in Catalog	Name: Pesticide A, Price: 500	High

	Upload		logged in	Product → Save			
TC010	Profile Update	FR010	User logged in	Navigate → Edit Profile → Update	Profile updated successfully	Address: "Hyd, India"	Low

TC011	Page Load Performance	NFR001 (Performance)	User logged in	Navigate to Catalog	N/A	Page should load within 3 seconds	High
TC012	Concurrent Users	NFR002 (Scalability)	Load testing tool configured	Simulate 500 concurrent users logging in	500 users credentials	System remains stable, response time < 5s	High
TC013	Data Encryption	NFR003 (Security)	SSL enabled	Login and Checkout	Email, Password, Card Data	All sensitive data transmitted over HTTPS, encrypted	High
TC014	Usability – Mobile Access	NFR004 (Usability)	Mobile device	Open catalog on Android/iOS	Device: Samsung, iPhone	UI should adjust responsively, easy to navigate	Medium
TC015	Backup & Recovery	NFR005 (Reliability)	Database available	Simulate server crash → Restore from backup	Order ID: 4567	Data recovered, order history intact	High

Question 6: DB Design.

Database design is the process of *creating a detailed data model* for a database. This model, which includes logical and physical design specifications, *defines the data that will be stored, how the data elements relate to one another, and how the data will be organized and structured to meet the specific requirements of a business or application*. The primary goals of a well-designed database are to ensure data integrity, minimize redundancy, improve performance, and enhance scalability.

Key Goals of Database Design

1. **Data Integrity:** This ensures that data is accurate and consistent across the database. It is achieved through the use of constraints, such as unique keys, foreign keys, and validation rules.
2. **Reduced Redundancy:** By structuring data to eliminate duplicate information, database design saves storage space and prevents update anomalies, where a change in one location is not reflected in all others.

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3. **Data Efficiency:** A good design ensures that data can be retrieved, inserted, and updated quickly and efficiently. This is often achieved through **normalization**, a process of organizing data to reduce redundancy and improve data integrity. Normal forms, such as the first normal form (1NF), second normal form (2NF), and third normal form (3NF), are used to guide this process.
 4. **Flexibility and Scalability:** A well-designed database can easily adapt to future changes in business requirements and can handle growth in data volume and user load without significant performance degradation.

Stages of Database Design

Database design is typically an iterative process that involves three main stages:

1. Conceptual Design

This is the initial, high-level stage where the data requirements are identified and modeled. It is independent of any specific database management system (DBMS). The main outcome of this stage is an **Entity-Relationship Diagram (ERD)**.

- **Entities:** These are the key objects or concepts about which data is stored (e.g., **Customer**, **Product**, **Order**).
- **Attributes:** These are the properties of the entities (e.g., **Customer** has a **Name** and **Address**).
- **Relationships:** These describe how entities are linked to each other (e.g., a **Customer** **places** an **Order**).

2. Logical Design

In this stage, the conceptual model is translated into a structured data model that is specific to a type of database, such as a relational, document, or graph database. For relational databases, this involves creating a schema of tables, columns, primary keys, and foreign keys. This stage focuses on how the data will be organized and stored from a logical perspective, without considering the physical implementation details.

3. Physical Design

This is the final stage where the logical design is implemented on a specific DBMS. This involves making practical decisions about data types, indexing, storage allocation, and physical table structures to optimize performance. Considerations in this stage include:

- **Indexes:** Creating indexes on frequently searched columns to speed up data retrieval.
- **Storage and Partitions:** Deciding how data will be physically stored and partitioned on disk.
- **Security:** Defining user access rights and security policies.

By following these stages, a business can create a robust and efficient database that serves its current needs while providing a solid foundation for future growth.

Question 7 : Define Data Flow Diagram. Draw a data flow diagram to represent the in-flow and out-flow of data when a Farmer is placing an order for the product.

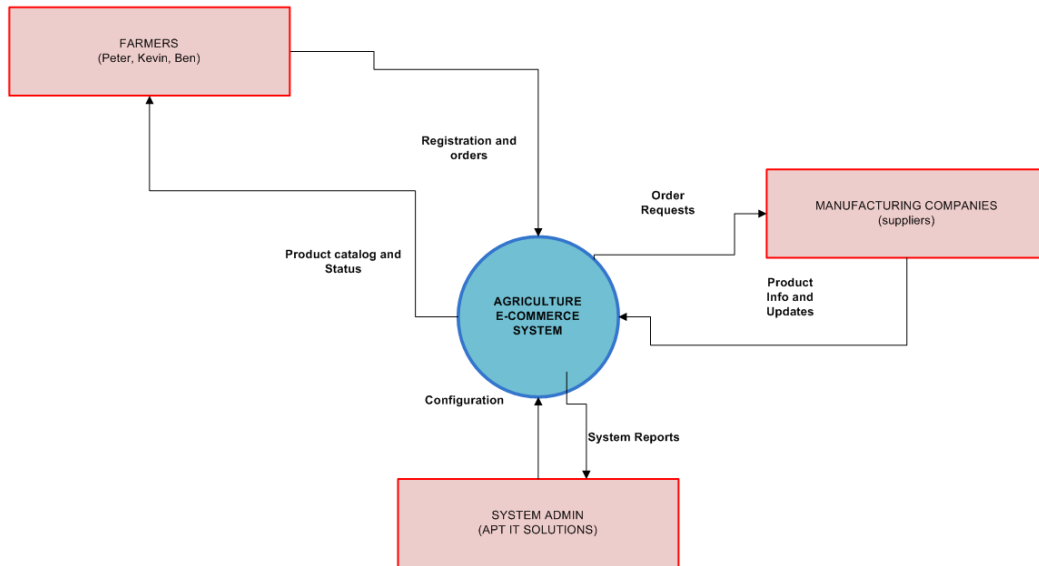
Data Flow Diagram (DFD) is a modeling technique used to visualize the flow of information through a system or business process. It shows where data comes from, which activities process the data, and where the output results are stored or utilized. The diagram has no control flow; it focuses solely on the movement of data, not on the sequence or timing of events.

The key components of a DFD are:

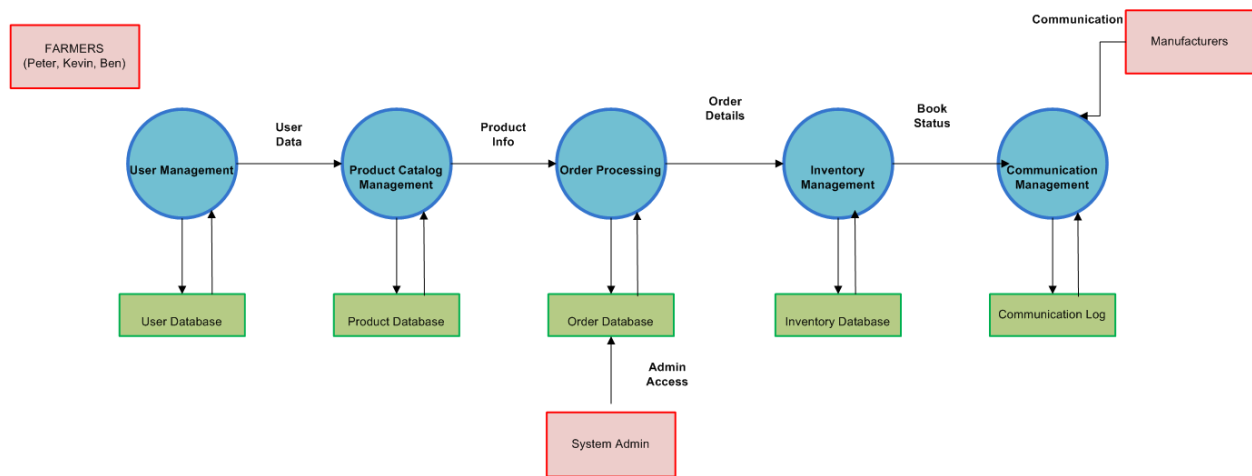
- **External Entities:** Sources or destinations of data outside the system boundary (e.g., the Farmer, the Manufacturer).
- **Processes:** Activities that transform data from one form to another (e.g., Place Order, Process Payment).
- **Data Stores:** Repositories where data is stored for later use (e.g., Products Database, Orders History).
- **Data Flows:** The movement of data from one component to another, represented by arrows.

Online Agriculture Products Store-
Data Flow Diagram

Level 0- Context Diagram



Level 1- Detailed Data Flow Diagram



Question 8: Change Request

A **Change Request (CR)** is a formal proposal to modify any aspect of a project's deliverables, scope, processes, or resources. In business analysis, a CR typically arises when stakeholders identify a new need, a regulatory update, or a correction to existing requirements. According to

BABOK v3 (Requirements Life Cycle Management), handling CRs is essential to maintain alignment between business needs and delivered solutions.

When a change arises—like the **government modifying taxation structure**—the Business Analyst must ensure the project adapts without compromising scope, quality, or timelines. Handling involves:

A. Logging the Change Request

- a. A CR form is created with details: Request ID, requester name, description, impact area (e.g., “Tax module update”), and date.

B. Categorizing the Change

- a. Type: Regulatory (mandatory, since it is a government requirement).
- b. Nature: Functional (affects how tax is calculated in the system).

C. Impact Analysis

- a. Assess how the change affects **requirements, budget, timelines, testing, deployment, and compliance**.
- b. Example: Updating tax rules impacts order processing, payment gateway, invoices, and reports.

D. Stakeholder Review & Approval

- a. Present findings to the Steering **Committee (Mr. Henry, SOONY reps, APT IT Solutions PM)**.
- b. BA ensures stakeholders understand the trade-offs and risks.

E. Requirement Update & Baseline Revision

- a. Update **Requirement Documents, RTM, and Use Cases**.
- b. Version control ensures traceability between old and new tax structures.

F. Implementation & Testing

- a. Developers update logic → Testers validate new tax calculations → Regression tests confirm no side-effects.

G. Sign-off & Deployment

-
- a. Stakeholders approve → Updated feature deployed → UAT confirmation → Production release.

Subtopics of Change Request:

- 1) **Change Request Form (CRF)** – Standard template to capture request details.
- 2) **Change Control Board (CCB)** – Group responsible for evaluating and approving/rejecting CRs.
- 3) **Impact Analysis Report** – BA-led analysis on effort, cost, and schedule changes.
- 4) **Baseline Management** – Ensuring requirements baseline is updated after CR approval.
- 5) **Traceability** – Linking CRs back to original requirements via RTM.

For this agriculture e-commerce CSR initiative, the taxation structure change directly affects farmers (end users) and manufacturers. As BA, I would document the CR, analyze its impact on order workflows and invoices, update requirement baselines, ensure re-testing of payment gateways, and finally obtain stakeholder sign-off before implementation.

Question 9: – Change Request Vs an Enhancement.

A **Change Request** is the *mechanism* used to initiate and manage any alteration to the scope. It's the official process for logging, assessing, and deciding whether to proceed with a change. The proposed change could be a bug fix, an improvement to existing functionality, or the addition of a new feature.

An **Enhancement**, in the context of business analysis, is a specific *type* of change. It refers to the addition of new functionality or an improvement to a solution that provides additional value to the stakeholders beyond the original scope. An enhancement is often the *reason* for a Change Request.

For example, if an online store initially had only a basic product search, a proposal to add a "filter by price" option would be considered an **enhancement**. To get this enhancement approved and implemented, a business analyst would likely create a **Change Request** and follow the defined process for managing it.

Aspect	Change Request	Enhancement
Definition	A formal, documented proposal to modify any aspect of a solution or a requirement.	A specific type of change that adds new functionality or improves a solution to deliver new value.

Function	The process or mechanism for managing and controlling changes to the project scope.	The reason for the change; the value-adding component being proposed.
Scope	Broad. Can cover a wide range of modifications, including defect fixes, scope adjustments, or improvements.	Narrow. Specifically refers to an improvement or expansion of a solution's capabilities.
Relationship	The container or official log. Every Enhancement must be submitted through a Change Request.	The content of the change. It is a specific type of Change Request.

Question 10: Estimations

Based on the **BABOK Guide v3**, **estimations** are a key component of the business analysis planning process. They are a prediction or approximation of the effort, cost, or duration required to complete a task, activity, or an entire initiative.

Estimations are inherently approximations and are most often expressed as a range rather than a single number. This is because they are made with limited information at the beginning of an initiative, and the degree of accuracy increases as more details are known.

Purpose of Estimations

According to the **Business Analysis Planning and Monitoring** knowledge area, the primary purpose of estimations is to provide the data needed for effective planning and decision-making. They help in:

- **Resource Allocation:** Determining the number and type of business analysts, developers, or other team members needed to complete the work.
- **Scheduling:** Establishing realistic timelines and deadlines for project milestones.
- **Budgeting:** Providing financial stakeholders with a clear understanding of the anticipated costs.
- **Risk Management:** Identifying areas of uncertainty or complexity that could impact the initiative, as reflected in the range of the estimate.

What is Estimated?

Business analysts typically estimate the following factors:

- **Effort:** The amount of work required, usually measured in person-hours, person-days, or story points.
- **Duration:** The total calendar time from start to finish.
- **Cost:** The financial resources needed for the activities.
- **Complexity:** The difficulty or technical challenge of the work.

Factors Influencing Estimations

The accuracy of an estimation is directly related to the available information. The **BABOK Guide** notes that estimations are influenced by several factors, including:

- The level of detail available in the requirements.
- The stability of the project scope.
- The skills and experience of the business analysis team.
- The level of stakeholder engagement.
- Assumptions and constraints on the solution.

Estimations are a critical part of the task **Plan Business Analysis Approach**, as they help a business analyst select the appropriate methodology (e.g., Agile, predictive) and tailor the business analysis activities to the needs of the initiative.

Question 11: UAT

According to the **BABOK Guide v3**, **User Acceptance Testing (UAT)** is a critical stage in the **Solution Evaluation** Knowledge Area. It is a formal process conducted by end-users and other stakeholders to determine if a solution satisfies the business needs and is ready for use in a production environment.

The Purpose of UAT

The main goal of UAT is to validate the solution from the perspective of the business. While other types of testing (like system or integration testing) focus on technical integrity and functionality, UAT focuses on whether the solution is a good fit for the business and meets the requirements as originally defined. It answers the question: "Does this solution actually solve our problem and provide the value we expected?"

Key Aspects of UAT

- **Stakeholder-Led:** UAT is performed by the people who will be using the solution daily, such as end-users, business managers, or subject matter experts. Their involvement is essential to ensure the solution meets their needs.
- **Validation, Not Verification:**
 - **Verification** is about checking if the solution was built correctly ("Did we build the product right?"). This is typically the focus of quality assurance (QA) teams and developers.
 - **Validation** is about checking if the right solution was built to begin with ("Did we build the right product?"). UAT is a validation activity.
- **Focus on Business Scenarios:** UAT testers don't simply click buttons randomly. They execute real-world business scenarios, workflows, and use cases to simulate how the system will be used. This ensures that the solution supports actual business processes.
- **Final Sign-off:** A successful UAT concludes with a formal sign-off from key stakeholders, indicating their acceptance of the solution and readiness for deployment. This sign-off is a crucial risk management and governance step.

The business analyst plays a vital role in UAT, often being responsible for defining the scope of testing, preparing UAT test cases, and managing stakeholder expectations throughout the process.

Question 12: Project Closure Document

A **project closure document** is a formal artifact used to officially conclude a project or a phase of work. According to the **BABOK Guide v3**, this document is a key output within the **Business Analysis Planning and Monitoring** Knowledge Area. It serves as a comprehensive record that summarizes the final outcomes, assesses the success of the initiative against its original objectives, and captures valuable lessons learned for future projects.

The document typically includes an evaluation of how well the project delivered on its defined requirements and a formal sign-off from key stakeholders, signifying their acceptance of the solution. It's a critical tool for knowledge management, ensuring that both successes and challenges are documented for continuous process improvement.

Below is a draft of a project closure document for our online agriculture products store case study:

Project Closure Document: Online Agriculture Products Store

Project Title: Online Agriculture Products Store (AgriFind) **Version:** 1.0 **Date:** September 11, 2025 **Prepared By:** Business Analysis Team

1.0 Executive Summary

This document officially closes the initial phase of the Online Agriculture Products Store project. The objective was to design, develop, and launch a web-based platform allowing farmers to search for and place orders for agricultural products. This phase successfully delivered a functional prototype that meets the core requirements for product search, order placement, and payment processing. All key stakeholders have formally accepted the solution for a pilot launch.

2.0 Project Objectives and Outcomes

The project's success is evaluated against the following initial business objectives:

- **Objective:** Digitize the order placement process for farmers to improve efficiency and reduce manual errors.

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- **Outcome:** The solution has successfully transitioned the order process from a manual, phone-based system to a streamlined online platform.
 - **Objective:** Provide an intuitive and user-friendly interface for farmers with limited technical experience.
 - **Outcome:** User acceptance testing (UAT) indicated a high level of usability and positive feedback on the simplified user interface, validating this objective was met.
 - **Objective:** Establish a secure and reliable platform for processing orders and payments.
 - **Outcome:** The solution integrates with a third-party payment gateway, providing a secure method for transactions. Stress testing confirmed the platform's reliability under anticipated load.

3.0 Requirements Fulfillment Analysis

The business analysis team has verified that the delivered solution satisfies all approved requirements from the initial scope. The following key requirements have been fulfilled:

- **FR-1.1:** The system shall allow farmers to search for products by name and category.
- **FR-1.2:** The system shall allow a farmer to add products to a shopping cart.
- **FR-1.3:** The system shall provide a secure checkout process.
- **FR-1.4:** The system shall send an automated order confirmation to the farmer.

4.0 Lessons Learned

What Went Well

- **Stakeholder Engagement:** High-quality collaboration with farmer representatives and the internal product team led to a solution that closely aligns with user needs.
- **Agile Approach:** The use of an iterative development cycle allowed for quick feedback loops, enabling the team to make rapid adjustments to the design.
- **Technology Selection:** The chosen technology stack proved to be efficient for both development and deployment.

What Could Be Improved

- **Requirements Prioritization:** In a few instances, the team struggled with prioritizing a few "nice-to-have" features, which created minor scope creep. A clearer prioritization framework would benefit future phases.
- **Third-Party Integration:** The initial integration with the payment gateway took longer than expected due to documentation gaps. Future projects should include more comprehensive validation of third-party APIs during the discovery phase.

5.0 Final Assessment and Recommendations

The Online Agriculture Products Store project has successfully delivered a foundational platform that meets its core business objectives. The solution is ready for a pilot launch with a controlled group of farmers.

Recommendations for the next phase include:

- Developing a dashboard for internal staff to manage orders and inventory.
- Integrating a customer support module for farmers to submit inquiries.
- Expanding the product catalog and features based on pilot feedback.

6.0 Stakeholder Sign-Off

The undersigned stakeholders hereby agree that the solution satisfies the business requirements and is ready to proceed to the next phase.

- **Business Sponsor:** _____ (Signature)
- **Project Manager:** _____ (Signature)
- **Lead Business Analyst:** _____ (Signature)