# Case Study: Online Agricultural Products Store

Mr. Henry, after being successful as a businessman and has become one of the wealthiest persons in the city. Now, Mr. Henry wants to help others to fulfil their dreams. One day, Mr. Henry went to meet his childhood friends Peter, Kevin and Ben. They live in a remote village and do farming. Mr. Henry asked his friends if they are facing any difficulties in their day-to-day work.

Peter told Mr. Henry that he is facing difficulties in procuring fertilizers which are very important for farm. Kevin said that he is also facing the same problem in-case of buying seeds for farming certain crops. Ben raised his concern on lack of pesticides which could help in greatly reducing pests in crops.

After listening to all his friends’ problems, Mr. Henry thought that this is a crucial problem faced not only by his friends but also by so many other farmers. So, Mr. Henry decided to make an online agriculture product store to facilitate remote area farmers to buy agriculture products. Through this Online Web / mobile Application, Farmers and Companies (Fertilizers, seeds and pesticides manufacturing Companies) can communicate directly with each other.

The main purpose to build this online store is to facilitate farmers to buy seeds, pesticides, and fertilizers from anywhere through internet connectivity. Since new users are involved, Application should be user friendly.

This new application should be able to accept the product (fertilizers, seeds, pesticides) details from the manufacturers and should be able to display them to the Farmers. Farmers will browse through these products and select the products what they need and request to buy them and deliver them to farmers location.

Mr. Henry has given this project through **his Company SOONY**. In SOONY Company, Mr Pandu is Financial Head and Mr Dooku is Project Coordinator. Mr. Henry , Mr Pandu , and Mr Dooku formed one Committee and gave this project to **APT IT SOLUTIONS** company for **Budget 2 Crores INR and 18 months Duration** under CSR initiative**. Peter, Kevin and Ben** are helping the Committee and can be considered as **Stakeholders** share requirements for the Project.

Mr Karthik is the Delivery Head in APT IT SOLUTIONS company, and he reached out to Mr Henry through his connects and Bagged this project. APT IT SOLUTIONS company have Talent pool Available for this Project. **Mr Vandanam is project Manager, Ms. Juhi is Senior Java Developer, Mr Teyson, Ms Lucie, Mr Tucker, Mr Bravo are Java Developers. Network Admin is Mr Mike and DB Admin is John. Mr Jason and Ms Alekya are the Tester. And you joined this team as a BA.**

**Question 1: BPM (5M)**

Identify Business Process Model for Online Agriculture Store – (Goal, Inputs, Resources, Outputs, Activities, Value created to the end Customer)

**Answer:** The BPM is as follows:

Goal:

* Help farmers in remote areas to purchase the agricultural products directly from the manufacturer using a online platform.
* This would be helpful due to easy access, market transparency and convenience.

Inputs:

* Farmers need- pesticides, seeds, fertilizers
* Manufacturers Supply- List of agricultural products
* Availability: Check availability of products
* Payment gateway: Stablr payment gateway
* Delivery logistics partner

Resources

* Mobile applications
* Server
* Database
* Payment gateway
* Logistics partner
* Government Norms and Regulations
* Customer support

Output

* Ease of access to latest farming equipment
* Manufactures get to display their variety of products
* Provides delivery services to remote locations
* Ensures secure online transactions

Activity

* Farmer search for the required products
* Choose and compare among the products
* Check the availability of the selected products
* Order product from the cart
* Payment of the product
* Delivery of the selected product
* Providing feedback to the application

Value

* Convenience: Farmers even from remote areas can buy the products
* Reliability: Directly from manufacturer without the need of middlemen
* Improved efficiency: Farmers can focus more on the agricultural product

**Question 2: SWOT – 5M**

Mr Karthik is doing SWOT analysis before he accepts this project. What Aspects he Should consider as Strengths, as Weaknesses, as Opportunity and as Threats.

**Answer**: SWOT analysis based on Internal and external factorss:

Strengths

* Funding of INR 2 crores
* Clear vision and well-defined outline for the project
* Catering to crucial market need – huge demand will be satisfied
* Skilled team to solve the problem
* Technology driven approach – scalable and accessible project

Weakness

* Limited literacy of farmers
* Challenges for the logistics to reach remote areas
* Technological challenges on the user side – internet connectivity, mobile literacy

Opportunities

* Increased use of smartphones in the rural area
* Scalability of the project
* Government support would be feasible to receive grants
* Brand enhancement due to CSR activity

Threats

* Resistance to adoption due to technological illiteracy
* Competitors may launch a similar product
* Potential for online fraud
* Regulatory compliances can be a roadblock due to ecommerce and agricultural laws

**Question 3- Feasibility study - 5 M**

Mr Karthik is trying to do feasibility study on doing this project in Technology (Java), Please help him with points (HW SW Trained Resources Budget Time frame) to consider in feasibility Study.

**Answer:** Mr. Karthik needs to evaluate the feasibility of using Java technology for this project by considering the following aspects

Hardware Req.: - Client side Server, Database server. End-user device, Application to-be robust to handle large traffic and multiple users

Software Req.: - Programming language experts, Database management systems, Moblie application development, Security and compliances, Third party integration (Payment gateway, logistic apps)

Trained resources: - A team of 11 consisting of Mr Vandanam is the project Manager, Ms. Juhi is Senior Java Developer, Mr Teyson, Ms Lucie, Mr Tucker, Mr Bravo are Java Developers. Network Admin is Mr Mike and DB Admin is John. Mr Jason and Ms Alekya are the Tester. And I (Abhishek Bagul) as a BA.

Budget Constraint: INR 2 Crores

Time Frame: 18 months (based on std. SDLC phases)

**Question 4 – Gap Analysis - 5 M**

Mr Karthik must submit Gap Analysis to Mr Henry to convince to initiate this project. What points (compare AS-IS existing process with TO-BE future Process) to showcase in the GAP Analysis

**Answer:**  The goal of this analysis is to compare the current (AS-IS) process of the agricultural products procurement with the future (TO-BE) process where they would be using the Online agriculture store.

**AS-IS process**

* Farmers rely on the local dealers
* Prices are often higher compared to the original cost
* Farmers have to travel long distances for the procurement
* No assistance with respect to the quality of product in case of defects
* The process is expensive as the transportation cost is an additional expense

**TO-BE process**

* Farmers get to choose their products based on comparison
* There would be transparency in the pricing of products
* Orders can be place online and they will be delivered
* Customer-care services would be provided as an after-sales service to solve the issues
* The pricing would be relative and based on the quality of the product
* 2-way communication can happen between the farmers and the producer

**GAP which can be addressed using the proposed system**

* Convenience fpr the farmers
* Cost transparency to the farmers
* Direct customers for the companies
* Improved and robust supply chain will be created

**Question 5 – Risk Analysis - 10 M**

List down different risk factors that may be involved (BA Risks And process/Project Risks)

 **Answer:** The risks faced during this projects are as follows:

**BA risks:**

* Due to lack of understanding of this industry which might lead to difference in the perceived and actual product
* Different stakeholders might have different problems (farmers, manufacturers)
* To make sure that the farmers can use the product by keeping it easy to use
* Regulatory compliance may arise which should be consulted with an expert

**Project Risks:**

* There might be delay during delivery due to unforeseen logistic issues
* Due to the remote nature of areas there might be lack of technological prowess (internet connectivity, old mobile users, illiterate individuals)
* Compatible issues with the third party payment gateway and logistic partners
* Resistance from the farmers for the adoption of this system due to changing the regular process
* Competitors may use this opportunity to release a similar platform

**Question 6 – Stakeholder Analysis (RACI Matrix) - 8 M**

Perform stakeholder analysis (RACI Matrix) to find out the key stakeholders who can take Decisions and Who are the influencers

**Answer:** The RACI Matrix helps to identify the key stakeholders based on their roles and responsibilities in the project:

RACI stands for

* Responsible: those who do the work to complete the task
* Accountable: the final decision-makers; ownership of the task
* Consulted: whose opinions are sought before making decisions
* Informed: who need updated about the decisions

The stakeholders in this project are

* Mr. Henry – Project Sponsor
* Mr. Pandu – Financial head
* Mr. Dooku – Project coordinator
* Peter, Kevin, Ben – Stakeholders
* Mr. Kartik – Delivery head
* Mr. Vandanam – Project Manager
* Ms. Juhi – Senior Java Developer
* Mr. John – DB Admin
* Mr. Jason and Ms. Alekya – Tester
* Abhishek Bagul – BA

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| Tasks | Abhishek Bagul (BA) | Mr. Henry(Product sponsor) | Peter, Kevin, Ben (Stakeholder) | Mr. Kartik (Delivery head) | Mr. Vanadanam (Project Manager) | Ms Juhi and team |
| Requirement gathering | R |  | C | I | A |  |
| Requirement analysis | R |  |  |  | I |  |
| Development |  |  |  |  | A | R/I |
| Testing | I |  |  |  | I | R/C |
| Implementation | R |  |  | R | I |  |
| UAT | I | I |  |  | R/A |  |

* Mr. Henry & Mr. Pandu drive the high-level decisions.
* APT IT Solutions team executes the project with technical leadership
* Farmers and Manufacturers influence platform requirements but don’t take major decisions

**Question 7 – Business Case Document - 8 M**

Help Mr Karthik to prepare a business case document

**Answer:** Business Case documents are prepared during the initiation phase of the project and their purpose is to include the objectives, the costs and benefits of the project in order to convince the stakeholders.

Project Name: Online Agriculture Product Store

Client: Soony

Project sponsor: Mr. Henry

Project manager: Mr. Vandanam

Duration: 18 months

Executive summary:

The purpose of this business case is to develop an “Online Agriculture Product Store” to address the challenges faced by the farmers for the procurement of farming related products. This platform will help in creating a direct link between the companies which provide these products and the farmers. This should reduce the cost and the logistics difficulties while focusing the high-quality products. This project is taken under the CSR initiative by the firm.

Problem statement:

The farmers in remote areas struggle with the procurement of fertilizers, seeds, and pesticides along with other products. Limited access to the suppliers, along with the high cost of travels, lack of transparency in product pricing and quality makes it difficult for farmers to obtain the necessary resources to sustain their agricultural activities. These challenges affect productivity and also impact their overall financial stability. Thus, there is a need for a platform which can solve all these issues.

Solution:

The proposed solution is to the develop a **Online Agriculture Product Store**, (digital platform) designed to connect the farmers with the agricultural product manufacturers directly. The application will have the below features:

* Farmers can browse and purchase agricultural products directly
* The companies can submit their products directly on the application
* Orders are delivered to the farmers locations through integrated logistics
* Product reviews, recommendations, and certifications are provided
* Mobile and web-based accessibility ensure ease of use

Benefits:

The online agriculture products will provide the following benefits:

* Cost savings for farmers
* Increased sales for manufacturers
* Reduction in logistics and procurement time for the farmers
* Improved farmer livelihoods and digital inclusion
* Enhanced agricultural productivity and supply chain efficiency

Costs:

The budget for the project is INR 2 crores which will include the cost of development, testing, deployment, and maintenance. The duration of the project should be around 18 months.

Key stakeholders:

The key stakeholders in this project are:

* Mr. Henry the project sponsor
* Mr. Pandu the Financial head
* Mr. Dooku the Project coordinator
* Peter, Kevin, Ben as they have shared the requirements
* Mr. Kartik the Delivery head of APT solutions company
* Mr. Vandanam the Project Manager

Risks:

* There might be delay during delivery due to unforeseen logistic issues
* Due to the remote nature of areas there might be lack of technological prowess (internet connectivity, old mobile users, illiterate individuals)
* Compatible issues with the third-party payment gateway and logistic partners
* Resistance from the farmers for the adoption of this system due to changing the regular process
* Competitors may use this opportunity to release a similar platform

Conclusion:

This business case demonstrates that the Online Agriculture Product Store is a viable and impactful project that aligns with SOONY’s CSR objectives. It addresses key agricultural challenges and will improve farmer access to essential resources, reduce costs, and enhance productivity

Question 8 – Four SDLC Methodologies - 8 M

The Committee of Mr. Henry , Mr Pandu , and Mr Dooku and Mr Karthik are having a discussion on Project Development Approach.

Mr Karthik explained to Mr. Henry about SDLC. And four methodologies like Sequential Iterative Evolutionary and Agile. Please share your thoughts and clarity on Methodologies

**Answer:**

SDLC, stands for Software Development Life Cycle, is a process which is used by software developers to planning, designing, building, testing and for the deployment of the software. It consists of several methodologies namely Sequential, Iterative, Evolutionary, and Agile.

Sequential:

It is also know as Waterfall model, and follows a linear, step-by-step process where each phase of the software development process should be completed before moving forward. This methodology is applied when the requirements are well-defined by the client. Thus, this methodology cannot be used when the project has dynamic changing requirements.

Iterative:

This methodology works on multiple cycles (SDLC) with each cycle creating the prototype, testing it, and based on the acquired feedback making the necessary changes in each cycle to the prototype to finally get the final product. This methodology is dynamic in nature with many frequent changes throughout the project. It requires continuous involvement from the client side in order to not fall for scope-creep. Thus, this methodology is useful for projects with partially defined requirements which will need upgradations over time.

Evolutionary:

This methodology is somewhat similar to iterative process but here the initial prototype is not fully functional. Initially essential features are developed and followed by the additional functions. This methodology can deliver the key features at an faster rate, and the changes can be done during the development stage. This methodology isn best suited for projects where the requirements are not fully defined.

Agile:

This process follows a adaptive and collaborative approach whit short development sprints. This process is highly flexible and responsive to change, while promoting close collaboration between both the stakeholders and the devs team. This methodology is best used when the requirements change frequently and adaptions are to be made in the product.

**Question 9 – Waterfall RUP Spiral and Scrum Models – 8 M**

They discussed models in SDLC like waterfall RUP Spiral and Scrum . You put forth your understanding on these models

When the APT IT SOLUTIONS company got the project to make this online agriculture product store, there is a difference of opinion between a couple of SMEs and the project team regarding which methodology would be more suitable for this project. SMEs are stressing on using the V model and the project team is leaning more onto the side of waterfall model. As a business analyst, which methodology do you think would be better for this project?

**Answer:**

1. Waterfall Model:

It follows a linear, step-by-step process where each phase of the software development process should be completed before moving forward. This model is applied when the requirements are well-defined by the client. Thus, this model cannot be used when the project has dynamic or frequently changing requirements.

1. Rational Unified Process (RUP):

This is an iterative process which included the inception, elaboration, construction, and transition phases to refine and evolve the system. The iterations are made from implementing the learnings from the previous iterations. During the four phases various activities like modelling, analysis and designing, implementation, testing, and documentations are carried out.

1. Spiral Model:

This model combines the waterfall and iterative model while focusing on the systematic risk assessment. This is mostly used for large and complex projects. This model helps by continuous refinement of the product in phases while building a prototype at each phase. The radius of the spiral model refers to the cost of the projects, while the angular degree represents the progress of the project. But this process could be costly and time demanding based on the requirements.

These phases are broken into:

* Planning and understanding the requirements
* Risk analysis: Identify the potential risks
* Creating prototype
* Evaluation of the performance of the project
1. Scrum Model:

This model uses small development cycles called sprints, continuous feedback, and stakeholder inputs. This model is flexible to continuous changes in the requirements. Each of the sprint provides a complete result and is a variation of the final output. The sprints are of the duration of 2 to 4 weeks. This process has a initial point along with the list of requirements which are the inputs of the project. The client has the authority to prioritize the objectives after considering the value and cost of each of the objectives.

As a BA I would be leaning towards the Iterative Waterfall-model due to the following reasons:

* As the requirement in this project are well defined
* A structural approach would be ideal
* In this we can feedback on each level and would be helpful to tackle the changes
* The budget has been fixed which would be used for the proposed timeline
* During the documentation gathering process all the risks are identified
* The testing of the product would be effectively handled during the final phase with the inputs of the stakeholder and SMEs involved

**Question 10 – Waterfall Vs V-Model - 5 M**

Write down the differences between waterfall model and V model.

**Answer:**

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| **Waterfall Model** | **V Model** |
| It follows the Linear and sequential method. i.e. each phase should be completed before moving to the next phase | It is also sequential, while emphasizing on the validation and verification at every phase |
| This is a linear path from requirement, design to deployment and maintenance | This follows a “V” like path where the left side is the development and the right side is the testing |
| The softwares in this model have comparatively more defects | The softwares in this model have comparatively less defects due to continuous testing |
| Testing only done after the development phase is complete | Testing activity is conducted at each stage |
| Risks are generally identified during the initial stages of the project itself | As there is testing done regularly the risks are detected early and resolved |
| This model si suitable for smaller projects with well-defined requirements | This model s more suitable for complex projects  |
| This model is cost effective | Comparatively is more expensive due to rigorous testing and complex projects |
| Making changes in this model is a expensive issue | Making changes is relatively cheaper |

**Question 11 – Justify your choice - 3 M**

As a BA, state your reason for choosing one model for this project

**Answer:**  I will recommend the iterative waterfall model as the requirements are well-defined, thus using this model where continuous improvements are made using a structured approach. The reasons are as follows:

* The requirements for this project are well-defined
* Flexibility due to the feedback to the previous phases if there are any changes
* The feedback is usewd at the requirement, design, development and testing phases helps in detecting the issues and decreases the majot tisks with the project
* The budget and timeline are sacrosanct as this is a CSR initiative
* The farmers input need to be used during the testing process to make it easy for adaptation
* The bugs are addressed and resolved before moving to the next phase

This project will be user friendly for the farmers to use on a daily basis and support the manufacturers by reaching their consumers directly.

**Question 12 – Gantt Chart - 5 M**

The Committee of Mr. Henry, Mr Pandu, and Mr Dooku discussed with Mr Karthik and finalised on the V Model approach (RG, RA, Design, D1, T1, D2, T2, D3, T3, D4, T4 and UAT)

Mr Vandanam is mapped as a PM to this project. He studies this Project and Prepares a Gantt chart with V Model (RG, RA, Design, D1, T1, D2, T2, D3, T3, D4, T4 and UAT) as development process and the Resources are PM, BA, Java Developers, testers, DB Admin, NW Admin.

**Answer:** The start and end date are dependent on when the project starts, while the duration of the project is 18 months. The Gantt chart is as follows:

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| **Phase** | **Task description** | **Duration****(in months)** | **Resources** |
| **RG** | **Requirement Gathering** | **2** | **PM, BA** |
| **RA** | **Requirement Analysis** | **1** | **PM, BA** |
| **Design** | **System Design** | **2** | **PM, BA, Java Developers, DB Admin** |
| **D1** | **Development phase 1** | **2** | **Java Developers** |
| **T1** | **Testing phase 1** | **1** |

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| **Testers** |

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| **D2** | **Development phase 2** | **2** | **Java Developers, DB Admin** |
| **T2** | **Testing phase 2** | **1** | **Testers** |
| **D3** | **Development phase 3** | **2** | **Java Developers** |
| **T3** | **Testing phase 3** | **1** | **Testers** |
| **D4** | **Development phase 4** | **2** | **Java Developers** |
| **T4** | **Testing phase 4** | **1** | **Testers** |
| **UAT** | **User Acceptance Testing** | **2** |

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| **PM, BA, Testers, Stakeholders** |

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**Question 13 – Fixed Bid Vs Billing - 5 M**

Explain the difference between Fixed Bid and Billing projects

**Answer:**

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| **Fixed Bid Model** | **Billing Projects Model** |
| This model has a predefined scope, budget, and timeline discussed before the project begins. | This model is based on actual efforts used; the client is charged on the resources utilized over time. |
| The requirements are well-defined over the start of the project | The requirements are flexible which can be modified during the project |
| The cost of the project is determined during the initial stages | The client will bill the actual time spent by the team on the project |
| The risk is on the bidder, if there are unexpected risk during the project | The risk is on the client, as there might be budget overruns |
| This process is suitable for projects with clear deliverables and less changes | This process is suitable for long-term evolving projects where the requirements are volatile |

**Question 14 – Prepare Timesheets of a BA in various stages of SDLC - 20 M**

* Design Timesheet of a BA
* Development Timesheet of a BA
* Testing Timesheet of a BA
* UAT Timesheet of a BA
* Deployment and Implementation Timesheet of a BA

**Answers:**

**Time sheet of BA – Abhishek Bagul**

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| **Duration****(in months)** | **Phase** | **Activity** | **Time spent (in hours/per week)** |
| 2 | Requirement gathering | Identify and conduct stakeholder interviews to understand the requirements and then document them | 40 |
| 1 | Requirement analysis | Specify the requirements, model the requirements using use case diagrams. Perform gap analysis and refine the requirements | 44 |
| 2 | Design | Communicate the design elements to the client. Collaborate with the team to finalize the design. | 40 |
| 8 | Development | Co-ordinate with the teams and check the development after each stage. If there are any queries take the feedback and rectify the issues. Change requirements are resolved. | 41 |
| 4 | Testing | Working with the testing team for the creation of the test cases. Analyze the output of these cases and try to resolve the issues by providing feedback to the previous stages. Working on the UAT tests to ensure proper working of the application | 40 |
| 2 | UAT | Develop the proper plan for the UAT. Create the test cases. Analyze the user response to these test cases and document these results. | 42 |
| 2 | Deployment and Implementation | Design the RTM and co-ordinate all the functional specs with the client. Provide training session for the users and co-ordinate with the stakeholders. | 40 |