A Web-based farming assistant app to help the farmers in their daily activities and aid in better decision making.

Final Year Project Proposal

(COMP1682)

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Abstract:

The world's population is growing, as well as the demand for food. Many developed countries are trying to find alternative ways to grow food and fulfill the increasing demand for food supply. Developed countries are now adopting AI and IoT technologies to increase their farming capabilities (Rudolph, 2019). But the underdeveloped or poor countries with an unstable financial situation are deprived of the advantage of AI and IoT in the agriculture industry, due to the expense and lack of technological advancement.

This motivated me to develop an e-Agriculture system that will be focused on improving agriculture and rural development by providing better information and communication system (Chauhan, 2015). The web-based system is aimed to help farmers increase their crop yield and decrease the production cost by helping them make better decisions and help them maintain or manage their daily farming activities.

To develop this project proper research, planning, analysis, and testing will be done to ensure the best outcome. To create the system and manage the development process a development framework will be followed as a guideline/rule to ensure effectiveness and work efficiency. Hopefully, the output web application from this project will be very helpful for the farmers.

1. Introduction.

The agriculture sector is the economic backbone for many countries and occupies a large portion of the total GDP. The growing population of the world is estimated to reach 10 billion by 2050. Therefore the agriculture sector needs technological advancement that any country can adapt to.

The proposed solution is a Farming Assistant Web Application named (AgroTechBD). It is a web-based database-driven application that will provide a platform for the farmers to directly connect to the seller or retailer so that they can buy products at a lower cost. Farmers will be able to predict crop yield, detect disease or insect early, manage their farming data, get regular weather updates, and can communicate with plant or veterinary doctors.

Tech giants like IBM and Microsoft have developed drones, farming robots, and other IoT, Machine learning, big data, and AI-based solution to enhance the agriculture sector. But these technologies are not affordable for many countries due to the expense and lack of technological advancement. Some of the popular software-based agriculture solutions are Agrivi, AgDNA, AgroSense, and Sentera. (Imanuel, 2017) Although these solutions are pretty popular, further research can be conducted to develop this solution furthermore and fill out the missing gaps in research.

2. Research aim and objectives.

Aim: The main aim of this research is to develop a web-based farming assistant app that will be able to help the farmers manage and keep track of their daily farming activities and will aid in better decision making.

Objectives:

- **Objective 1:** Extensive research/investigation on similar products to exploit the weakness or gaps in the existing solutions.
- **Objective 2:** Analyze the system requirement specification for managing the farming.
- **Objective 3:** Research the usability and design specification of the product.
- **Objective 4:** Develop / code a useable product/solution.
- **Objective 5:** Generate test plan and test and evaluate the developed solution.

- **Objective 6:** Generate the project research report.

Table 1: Summary of objective, methods, deliverables, and duration are provided in Appendix-A.

3. Research approach.

To meet the project goal, proper research needs to be done. For gathering information about the problem, some techniques were followed which are surveys, questionnaires observation, and SWAT analysis. By using these techniques I was able to find the flaws and gaps in the existing solutions and was able to complete the literature review, product research, and feasibility study of this project. This will take about two weeks to be completed.

To analyze the system requirement and identify the system scope and boundaries, observation, and brainstorming techniques were used. The analysis part will take about ten days to complete.

To create the system design specification Unified Modeling Language (UML), an Object-oriented model was used. The design part will produce data design, architecture design, interface design, and procedural design. The design part will take 2 weeks to complete.

After the design part, the actual solution development process starts, and here the database and website were developed following the object-oriented model. This will take about 6 weeks to complete.

During the test and evaluation part first, a test plan and test design are created. Then the test is executed using the white-box testing and a test report is generated. This will take about a week.

4. Planning.

In the planning stage, the entire project is divided into several small tasks (milestones), by applying a work breakdown structure (WBS). The entire project will take about three months to complete. The Gantt chart provided in **appendix B** shows the work breakdown for this project.

5. Legal, Social, Ethical, and Professional Issues and Consideration.

While developing software or application it is necessary to consider Legal, Social, Ethical, and Professional Issues. These issues include data security, presentation of incorrect data, misusing of user data, etc. Farmers should not be presented with the wrong data.

References

Imanuel, 2017. *Top 6 precision agriculture software.* [Online]
Available at: https://www.predictiveanalyticstoday.com/top-precision-agriculture-software/
[Accessed 17 08 2020].

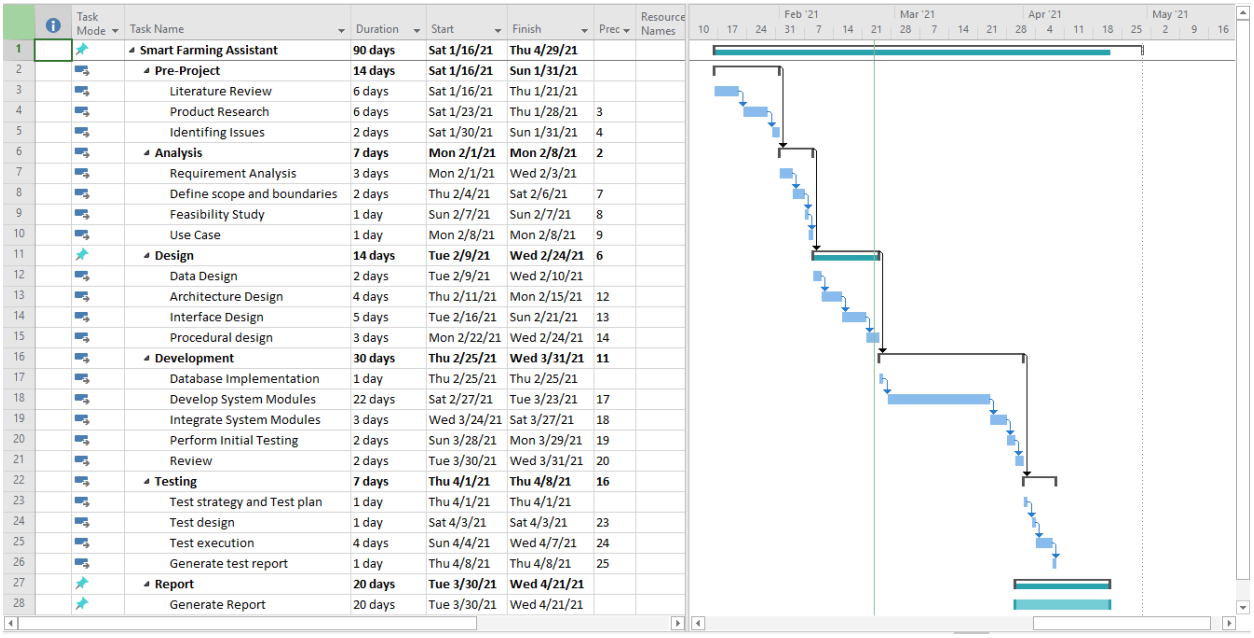
Rudolph, C., 2019. *Deploying precision agriculture in developing countries provides opportunities, challenges.* [Online]
Available at: https://www.canr.msu.edu/news/deploying-precision-agriculture-in-developing-countries-provides-opportunities-challenges
[Accessed 13 07 2020].

Appendix

Appendix-A:

Objective	Method	Deliverable	Duration
Objective 1	• Survey • Questionnaires • Observation • SWAT analysis.	• Literature review. • Product research • Identify legal, social, ethical, and professional issues.	2 weeks
Objective 2	• Brainstorming • Observation • Unified Modeling Language (UML)	• Identify the functional and non-functional requirements. • Define system scope and boundaries. • Feasibility study. • Use Case	1 week
Objective 3	• Unified Modeling Language (UML) • Object-oriented model	• Data design (ERD, Class diagram) • Architecture Design (DFD, Rich picture, Activity diagram, Sequence diagram) • Interface design (UI, UX designs, Prototype) • Procedural design (Algorithm design)	2 week
Objective 4	• Object-oriented model	• Database • Develop system modules • Integrate system modules • Perform initial testing • Review	5 weeks
Objective 5	• White box testing.	• Test strategy and Test plan • Test design • Test execution (white-box testing) • Generate test report	1 week
Objective 6		• Reflection of the whole project in a written document.	3 week

Appendix-B:



	Task Mode	Task Name	Duration	Start	Finish	Prec	Resource Names
1		**Smart Farming Assistant**	**90 days**	**Sat 1/16/21**	**Thu 4/29/21**		
2		**Pre-Project**	**14 days**	**Sat 1/16/21**	**Sun 1/31/21**		
3		Literature Review	6 days	Sat 1/16/21	Thu 1/21/21		
4		Product Research	6 days	Sat 1/23/21	Thu 1/28/21	3	
5		Identifing Issues	2 days	Sat 1/30/21	Sun 1/31/21	4	
6		**Analysis**	**7 days**	**Mon 2/1/21**	**Mon 2/8/21**	**2**	
7		Requirement Analysis	3 days	Mon 2/1/21	Wed 2/3/21		
8		Define scope and boundaries	2 days	Thu 2/4/21	Sat 2/6/21	7	
9		Feasibility Study	1 day	Sun 2/7/21	Sun 2/7/21	8	
10		Use Case	1 day	Mon 2/8/21	Mon 2/8/21	9	
11		**Design**	**14 days**	**Tue 2/9/21**	**Wed 2/24/21**	**6**	
12		Data Design	2 days	Tue 2/9/21	Wed 2/10/21		
13		Architecture Design	4 days	Thu 2/11/21	Mon 2/15/21	12	
14		Interface Design	5 days	Tue 2/16/21	Sun 2/21/21	13	
15		Procedural design	3 days	Mon 2/22/21	Wed 2/24/21	14	
16		**Development**	**30 days**	**Thu 2/25/21**	**Wed 3/31/21**	**11**	
17		Database Implementation	1 day	Thu 2/25/21	Thu 2/25/21		
18		Develop System Modules	22 days	Sat 2/27/21	Tue 3/23/21	17	
19		Integrate System Modules	3 days	Wed 3/24/21	Sat 3/27/21	18	
20		Perform Initial Testing	2 days	Sun 3/28/21	Mon 3/29/21	19	
21		Review	2 days	Tue 3/30/21	Wed 3/31/21	20	
22		**Testing**	**7 days**	**Thu 4/1/21**	**Thu 4/8/21**	**16**	
23		Test strategy and Test plan	1 day	Thu 4/1/21	Thu 4/1/21		
24		Test design	1 day	Sat 4/3/21	Sat 4/3/21	23	
25		Test execution	4 days	Sun 4/4/21	Wed 4/7/21	24	
26		Generate test report	1 day	Thu 4/8/21	Thu 4/8/21	25	
27		**Report**	**20 days**	**Tue 3/30/21**	**Wed 4/21/21**		
28		Generate Report	20 days	Tue 3/30/21	Wed 4/21/21		

Figure 1: Gantt chart.