

PROJECT-II REPORT

On

Fully Automated Farming System

Submitted to Rajasthan Technical University
in partial fulfillment of the requirement for the award of the degree of

B.TECH.

in

COMPUTER ENGINEERING

Submitted By

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**Under the Guidance of
Mr. Ajay Saini**

at



**POORNIMA INSTITUTE OF ENGINEERING & TECHNOLOGY, JAIPUR
RAJASTHAN TECHNICAL UNIVERSITY, KOTA
October, 2019**

CERTIFICATE

This is to be certified that the project entitled “ Fully Automated Farming System ” has been submitted for the Bachelor of Computer Science and Engineering, Poornima Institute Of Engineering & Technology, Jaipur during the academic year 2018-2019 is a bonafide piece of project work

carried out by “ -----& -----” towards the partial fulfillment for the award of the Degree (B.Tech.) under the guidance of “**Mr. Ajay Saini**” and supervision and no part of thereof has been submitted by them for any degree or diploma.

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hereby declare that the Project Report entitled “ **Fully Automated Farming System**” is an original work and data provided in the study is authentic to the best of our knowledge. This report has not been submitted to any other Institute for the award of any other degree.

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ABSTRACT

Our product intends to assist the farmers in several ways such as protecting their farms from unauthorised entry of any animal or human being, informing them about the quantity and quality of the pesticides to be used, controlling motor without actually visiting the field, getting live data(Temperature, soil moisture, smoke detection) for efficient environment monitoring which will enable them to do smart farming and increase their overall yield and quality of products and also helping them to know for how long fruits and vegetables can be stored without getting rot. The web/app-enabled interface allows the users to login from anywhere in the world to get information about their farm such as fertility of soil, security information about the farm, quantity and quality of pesticides and many more. At last main objective is to increase the products' quality and quantity with minimum available resource and increasing profit

KEYWORDS:

Farming, Moisture, Humidity, Sensors

CHAPTER 1

INTRODUCTION TO PROJECT

Project Aim and Objective

Our product intends to assist the farmers in several ways such as protecting their farms from unauthorised entry of any animal or human being, informing them about the quantity and quality of the pesticides to be used, controlling motor without actually visiting the field, getting live data(Temperature, soil moisture, smoke detection) for efficient environment monitoring which will enable them to do smart farming and increase their overall yield and quality of products and also helping them to know for how long fruits and vegetables can be stored without getting rot.

Origin of the Proposal: Farmers cannot monitor each and everything in their farm every time. Also they don't have that technology which they can use for this purpose at affordable cost. Our aim is to make them available such technology at affordable cost.

Definition of the problem:

Controlling motor without visiting the field

Checking temperature, humidity, soil fertility and other factors with the help of various sensors in order to determine the fertility of the soil and increase their overall yield and quality of products

Determining the quantity and quality of the pesticides to be used.

Determining how long fruits and vegetables can be stored.

Increasing the security of the farm in order to protect crops from external and unwanted harm such as cattle attack, fire etc.

Objectives:

The web/app-enabled interface allows the users to login from anywhere in the world to get information about their farm such as fertility of soil, security information about the farm, quantity and quality of pesticides and many more. At last main objective is to increase the products' quality and quantity with minimum available resource and increasing profit.

Work Plan:

Stage 1: An idea for a project will be carefully examined to determine whether or not it benefits our Farmer.

During this phase, a decision making team will identify if the project can realistically be completed.

Stage 2: Study the technology that can be used to measure it and the requirements for this technology.

Stage 3: Learn the various tools for designing the prototype of the apparatus.

Stage 4: Learn the programming languages and database and analyse it for the working condition of apparatus prototype.

Stage 5: Design the hardware for the apparatus and test it.

Stage 6: Development of software and database and implement it on the hardware.

Stage 7: Final testing and put out in the real world.

Stage 8: Report writing.

Methodology:

Research work for collecting information about the technology and requirements involved in the project.



Design phase will include the designing of various interfaces for each module and preparing the schematic and hardware design.



Coding phase will include the developing codes for various interfaces and will be done on embedded C language and python.



Checking the circuits of all interfaces individually and remove the mistakes if any encountered.



Integrating all the individual modules and components together and review the whole system and test it.



Upload the program code on the hardware and test it for any risks or errors.



Deployment the final prototype in the market or real time environment and see its features.

Problem Statement

Our product intends to assist the farmers in several ways such as protecting their farms from unauthorised entry of any animal or human being, informing them about the quantity and quality of the pesticides to be used, controlling motor without actually visiting the field, getting live data(Temperature, soil moisture, smoke detection) for efficient environment monitoring which will enable them to do smart farming and increase their overall yield and quality of products and also helping them to know for how long fruits and vegetables can be stored without getting rot.

Background of the Project (Literature Survey)

Our product intends to assist the farmers in several ways such as protecting their farms from unauthorized entry of any animal or human being, informing them about the quantity and quality of the pesticides to be used, controlling motor without actually visiting the field, getting live data(Temperature, soil moisture, smoke detection) for efficient environment monitoring which will enable them to do smart farming and increase their overall yield and quality of products and also helping them to know for how long fruits and vegetables can be stored without getting rot. Farmers cannot monitor each and everything in their farm every time. Also they don't have that technology which they can use for this purpose at affordable cost. Our aim is to make them available such technology at affordable cost.

Software Requirements

Android Studio

Sublime Text Editor

Xampp

Hardware Requirements

Arduino

Raspberry pi

Temperature Sensor

Soil Sensor

Humidity Sensor

Motion Sensor

Power Sensor

CHAPTER 2

PRODUCT BACKLOG

(20 to 30 page)

1. PRODUCT Backlog

A product backlog is a prioritized list of work for the development team that is derived from the roadmap and its requirements. The most important items are shown at the top of the product backlog so the team knows what to deliver first. The development team doesn't work through the backlog at the product owner's pace and the product owner isn't pushing work to the development team. Instead, the development team pulls work from the product backlog as there is capacity for it, either continually (kanban) or by iteration (scrum). A team's roadmap and requirements provide the foundation for the product backlog. Roadmap initiatives break down into several epics, and each epic will have several requirements and user stories. Let's take a look at the roadmap for a fictitious product called Teams in Space. Since the Teams in Space website is the first initiative in the roadmap, we'll want to break down that initiative into epics (shown here in green, blue, and teal) and user stories for each of those epics. The backlog serves as the connection between the product owner and the development team. The product owner is free to re-prioritize work in the backlog at any time due to customer feedback, refining estimates, and new requirements. Once work is in progress, though, keep changes to a minimum as they disrupt the development team and affect focus, flow, and morale.

PRODUCT BACKLOG

Batch 2018_2019

SPRINT BACKLOG	US ID	BACKLOG ITEM		PRIORITY	RESPONSIBLE	ESTIMATE DATE	REMARKS
		AS A/AN	I WANT TO				
		Farmer	login into fully automated farming system Application/Web portal				I can Access the available functionality.
		Farmer	See the current climatical condition update on portal				I can understand daily upadate.
		Farmer	check the historical data for soil /climate/area etc				It can help for planning further farming.
		Farmer	get idea of different crops & composition of petisides				I can analyse which is best.
		Farmer	check soli moister detail				It will help to decide crop is fit for farming or not.
		Farmer	get the moisture of my field				the watering pump will automatically start or schedule to start
		Farmer	get the smoke quantity of my field				the fire prevention system will automatically start.
		Farmer	get the smoke temperatureof my field				the fire prevention system will automatically start.
		Farmer	Know whether there is outside interference in my field or not				I can prevent my crops from Animals, birds and outsiders.
		Farmer	Amount of pesticides present in the field				I can protect my crops withoud harming them.
		Farmer	the quality of fruit				I can store it for long time
		Farmer	the quality of vegetables				I can store it for long time
		Farmer	determine whether my fruits are ready				I can export it to market
		Farmer	determine whether my Vegetables are ready				I can export it to market
		Farmer	determine the fertility of my field				I could know Whether my field is suitable for agriculture
		Farmer	determine the fertility of my field				I could know for which type of crops my field is suitable with
		Farmer	determine the fertility of my field				I could increase my production.
		Farmer	get the moisture of my field				I could know for which type of crops my field is suitable with
		Farmer	get the moisture of my field				I could know if my field is fertile or not
		DBA	Create a database				I can Store the data
		DBA	Normalize database				I can No overlaping and overwrite of data
		DBA	Architecture of database schamas				I can Use my database app or web protal
		DBA	Fire Insert Queries				I Can Insert New Records In The Database
		DBA	Fire Select Queries				I Can View The Records
		DBA	Fire Update Queries				I Can Keep The Database Updated
		DBA	Fire Delete Queries				I Can Remove Unwanted Or Faulty Data
		DBA	Take Backup				I Can Save The Old Records In The Database For Future Use
		DBA	Delete Backup				I Can Delete The Records Which Is Not Needed Any More
		DBA	Fetch the data from different portal				I can compare the data same entity
		DBA	Fetch from hardware data to database				I can compare the data with static parameter
		DBA	Display the data on our protal				I can access the my data and take some decision
		DBA	writing and tuning queries				I can peform CURD operation
		DBA	Reviewing database code and quries				I can make sure standers are met
		Admin	Login into the system using id and password				I can access the Fully Automated Farming System.
		Admin	Modify account password				I can keep my account secure
		Admin	Login into system				I can manage web environment design activities
		Admin	Login into system				I can manage web environment deployment activities
		Admin	Login into system				manage web environment development activities
		Admin	Login into system				manage web environment maintenance activities
		Admin	secure website and app from viruses and malware				I cannot be exploited by hackers
		Admin	take user information				their secure account can be created
		Admin	monitor the traffic				traffic on website can be increased
		Admin	monitor the log files				I can fix problems due to slowdown or glitches
		Admin	perform testing				I can assure the quality of website
		Admin	backup data				I can prevent loss of information
		Admin	determine source of problems				they can be removed
		Admin	check and analyse operating system or log files				I can verify proper system performance
		Admin	Modify software programs				performance can be increased
		Admin	Resolve software problems				to increase user experience
		Admin	Update webpages				I can limit the loss of services
		Admin	get user feedback				I can increase the performance
		Admin	maintain computer networks				performance and user access can be enhanced
		Admin	analyse data				operational problems can resolved
		Admin	test websites				design flaws can be identified and removed.
		Admin	test websites				speed and efficiency can be increased

2. **Sprint Backlog-1**

(Half page Introduction of Sprint Backlog -1 and then Print of Your Existing excel sheet , including All graphs)

3. **Sprint Backlog-2**

(Half page Introduction of Sprint Backlog -2 and then Print of Your Existing excel sheet , including All graphs)

4. **Sprint Backlog-3**

(Half page Introduction of Sprint Backlog -3 and then Print of Your Existing excel sheet , including All graphs)

5. **Sprint Backlog-4**

(Half page Introduction of Sprint Backlog -4 and then Print of Your Existing excel sheet , including All graphs)

CHAPTER 3

TECHNOLOGY APPLIED AND PROJECT MANAGEMENT

(10 to 15 page)

Brief Description of All technologiesApplied in the Project.

Project management :

Project management is the application of processes, methods, knowledge, skills and experience to achieve the project objectives. General. A project is a unique, transient endeavor, undertaken to achieve planned objectives, which could be defined in terms of outputs, outcomes or benefits.

Project management is the practise of initiating, planning, executing, controlling, and closing the work of a team to achieve specific goals and meet specific success criteria at the specified time. A project is a temporary endeavor designed to produce a unique product, service or result with a defined beginning and end undertaken to meet unique goals and objectives, typically to bring about beneficial change or added value. The temporary nature of projects stands in contrast with business as usual, which are repetitive, permanent, or semi-permanent functional activities to produce products or services. In practice, the management of such distinct production approaches requires the development of distinct technical skills and management strategies.

Software project management

Software project management is the art and science of planning and leading software projects. It is a sub-discipline of project management in which software projects are planned, implemented, monitored and controlled.

The job pattern of an IT company engaged in software development can be seen split in two parts:

Software Creation

Software Project Management

A project is well-defined task, which is a collection of several operations done in order to achieve a goal (for example, software development and delivery). A Project can be characterized as:

Every project may have a unique and distinct goal.

Project is not routine activity or day-to-day operations.

Project comes with a start time and end time.

Project ends when its goal is achieved hence it is a temporary phase in the lifetime of an organization.

Project needs adequate resources in terms of time, manpower, finance, material and knowledge-bank.

Software Project

A Software Project is the complete procedure of software development from requirement gathering to testing and maintenance, carried out according to the execution methodologies, in a specified period of time to achieve intended software product.

Need of software project management

Software is said to be an intangible product. Software development is a kind of all new stream in world business and there's very little experience in building software products. Most software products are tailor made to fit client's requirements. The most important is that the underlying technology changes and advances so frequently and rapidly that experience of one product may not be applied to the other one. All such business and environmental constraints bring risk in software development hence it is essential to manage software projects efficiently.



The image above shows triple constraints for software projects. It is an essential part of software organization to deliver quality product, keeping the cost within client's budget constrain and deliver the project as per scheduled. There are several factors, both internal and external, which may impact this triple constrain triangle. Any of three factor can severely impact the other two.

Therefore, software project management is essential to incorporate user requirements along with budget and time constraints.

Software Project Manager

A software project manager is a person who undertakes the responsibility of executing the software project. Software project manager is thoroughly aware of all the phases of SDLC that the software would go through. Project manager may never directly involve in producing the end product but he controls and manages the activities involved in production.

A project manager closely monitors the development process, prepares and executes various plans, arranges necessary and adequate resources, maintains communication among all team members in order to address issues of cost, budget, resources, time, quality and customer satisfaction.

Let us see few responsibilities that a project manager shoulders -

Managing People

- Act as project leader

- Liaison with stakeholders

- Managing human resources

Setting up reporting hierarchy etc.

Managing Project

Defining and setting up project scope

Managing project management activities

Monitoring progress and performance

Risk analysis at every phase

Take necessary step to avoid or come out of problems

Act as project spokesperson

Software Management Activities

Software project management comprises of a number of activities, which contains planning of project, deciding scope of software product, estimation of cost in various terms, scheduling of tasks and events, and resource management. Project management activities may include:

Project Planning

Scope Management

Project Estimation

Project Planning

Software project planning is task, which is performed before the production of software actually starts. It is there for the software production but involves no concrete activity that has any direction connection with software production; rather it is a set of multiple processes, which facilitates software production. Project planning may include the following:

Scope Management

It defines the scope of project; this includes all the activities, process need to be done in order to make a deliverable software product. Scope management is essential because it creates boundaries of the project by clearly defining what would be done in the project and what would not be done. This makes project to contain limited and quantifiable tasks, which can easily be documented and in turn avoids cost and time overrun.

During Project Scope management, it is necessary to -

Define the scope

Decide its verification and control

Divide the project into various smaller parts for ease of management. Verify the scope

Control the scope by incorporating changes to the scope

Project Estimation

For an effective management accurate estimation of various measures is a must. With correct estimation managers can manage and control the project more efficiently and effectively.

Project estimation may involve the following:

Software size estimation

Software size may be estimated either in terms of KLOC (Kilo Line of Code) or by calculating number of function points in the software. Lines of code depend upon coding practices and Function points vary according to the user or software requirement.

Effort estimation

The managers estimate efforts in terms of personnel requirement and man-hour required to produce the software. For effort estimation software size should be known. This can either be derived by managers' experience, organization's historical data or software size can be converted into efforts by using some standard formulae.

Time estimation

Once size and efforts are estimated, the time required to produce the software can be estimated. An effort required is segregated into sub categories as per the requirement specifications and interdependency of various components of software. Software tasks are divided into smaller tasks, activities or events by Work Breakthrough Structure (WBS). The tasks are scheduled on day-to-day basis or in calendar months.

The sum of time required to complete all tasks in hours or days is the total time invested to complete the project.

Cost estimation

This might be considered as the most difficult of all because it depends on more elements than any of the previous ones. For estimating project cost, it is required to consider -

- Size of software
- Software quality
- Hardware
- Additional software or tools, licenses etc.
- Skilled personnel with task-specific skills
- Travel involved
- Communication
- Training and support

Project Estimation Techniques

We discussed various parameters involving project estimation such as size, effort, time and cost. Project manager can estimate the listed factors using two broadly recognized techniques

Decomposition Technique

This technique assumes the software as a product of various compositions.

There are two main models -

Line of Code Estimation is done on behalf of number of line of codes in the software product.

Function Points Estimation is done on behalf of number of function points in the software product.

Empirical Estimation Technique

This technique uses empirically derived formulae to make estimation. These formulae are based on LOC or FPs.

Putnam Model

This model is made by Lawrence H. Putnam, which is based on Norden's frequency distribution (Rayleigh curve). Putnam model maps time and efforts required with software size.

COCOMO

COCOMO stands for COConstructiveCOstMOdel, developed by Barry W. Boehm. It divides the software product into three categories of software: organic, semi-detached and embedded.

Project Scheduling

Project Scheduling in a project refers to roadmap of all activities to be done with specified order and within time slot allotted to each activity. Project managers tend to define various tasks, and project milestones and they arrange them keeping various factors in mind. They look for tasks lie in critical path in the schedule, which are necessary to complete in specific manner and strictly within the time allocated. Arrangement of tasks which lies out of critical path are less likely to impact over all schedule of the project.

For scheduling a project, it is necessary to -

- Break down the project tasks into smaller, manageable form
- Find out various tasks and correlate them
- Estimate time frame required for each task
- Divide time into work-units
- Assign adequate number of work-units for each task
- Calculate total time required for the project from start to finish

Resource management

All elements used to develop a software product may be assumed as resource for that project. This may include human resource, productive tools and software libraries.

The resources are available in limited quantity and stay in the organization as a pool of assets. The shortage of resources hampers the development of project and it can lag behind the

schedule. Allocating extra resources increases development cost in the end. It is therefore necessary to estimate and allocate adequate resources for the project.

Resource management includes -

- Defining proper organization project by creating a project team and allocating responsibilities to each team member

- Determining resources required at a particular stage and their availability

- Manage Resources by generating resource request when they are required and de-allocating them when they are no more needed.

Project Risk Management

Risk management involves all activities pertaining to identification, analysing and making provision for predictable and non-predictable risks in the project. Risk may include the following:

- Experienced staff leaving the project and new staff coming in.

- Change in organizational management.

- Requirement change or misinterpreting requirement.

- Under-estimation of required time and resources.

- Technological changes, environmental changes, business competition.

Risk Management Process

There are following activities involved in risk management process:

- Identification** - Make note of all possible risks, which may occur in the project.

- Categorize** - Categorize known risks into high, medium and low risk intensity as per their possible impact on the project.

- Manage** - Analyze the probability of occurrence of risks at various phases. Make plan to avoid or face risks. Attempt to minimize their side-effects.

- Monitor** - Closely monitor the potential risks and their early symptoms. Also monitor the effects of steps taken to mitigate or avoid them.

Project Execution & Monitoring

In this phase, the tasks described in project plans are executed according to their schedules.

Execution needs monitoring in order to check whether everything is going according to the plan. Monitoring is observing to check the probability of risk and taking measures to address the risk or report the status of various tasks.

These measures include -

Activity Monitoring - All activities scheduled within some task can be monitored on day-to-day basis. When all activities in a task are completed, it is considered as complete.

Status Reports - The reports contain status of activities and tasks completed within a given time frame, generally a week. Status can be marked as finished, pending or work-in-progress etc.

Milestones Checklist - Every project is divided into multiple phases where major tasks are performed (milestones) based on the phases of SDLC. This milestone checklist is prepared once every few weeks and reports the status of milestones.

Project Communication Management

Effective communication plays vital role in the success of a project. It bridges gaps between client and the organization, among the team members as well as other stake holders in the project such as hardware suppliers.

Communication can be oral or written. Communication management process may have the following steps:

Planning - This step includes the identifications of all the stakeholders in the project and the mode of communication among them. It also considers if any additional communication facilities are required.

Sharing - After determining various aspects of planning, manager focuses on sharing correct information with the correct person on correct time. This keeps every one involved the project up to date with project progress and its status.

Feedback - Project managers use various measures and feedback mechanism and create status and performance reports. This mechanism ensures that input from various stakeholders is coming to the project manager as their feedback.

Closure - At the end of each major event, end of a phase of SDLC or end of the project itself, administrative closure is formally announced to update every stakeholder by sending email, by distributing a hardcopy of document or by other mean of effective communication.

After closure, the team moves to next phase or project.

Configuration Management

Configuration management is a process of tracking and controlling the changes in software in terms of the requirements, design, functions and development of the product.

IEEE defines it as “the process of identifying and defining the items in the system, controlling the change of these items throughout their life cycle, recording and reporting the status of items and change requests, and verifying the completeness and correctness of items”.

Generally, once the SRS is finalized there is less chance of requirement of changes from user. If they occur, the changes are addressed only with prior approval of higher management, as there is a possibility of cost and time overrun.

Project management Tools:

Project management required tools to manage the work , time and resources. At present many of the software are available for project management. Some of the popular software tools are as follows.

1. Trello

Trello is an project management tool, instead this app is a free visual way to to glance at the entire project with a single view. With Trello you can organise cards, these cards can be your thoughts, conversations and to-do lists and be placed on a board for everyone to collaborate on.

02. Basecamp

Basecamp is the granddaddy of project management apps. Basecamp is considered the leading project management tool around. It boasts a simple and easy to use interface to collaborate with your team and client. It allows you to create multiple projects and setup discussions, write to-do lists, manage files, create and share documents, and organise dates for scheduling.

03. Teamwork Projects

Teamwork Projects is the ultimate productivity tool to manage projects with your team. Teamwork allows you to keep all your projects, tasks and files all in one place and easily collaborate with a team. Teamwork helps you to visualise the entire project through a marked calendar and gantt chart and setup reporting. Teamwork supports file management with Google Drive, Box.com and Dropbox. As well as integration with leading apps such as third party accounting software and customer support apps.

04. Resource Guru

Billed as the "simple way to schedule people, equipment and other resources", Resource Guru is a streamlined resource scheduling and leave management tool that's designed to keep your projects on track. You can plan your team's workloads, receive daily booking reminders, report on KPIs, and more. Apple, Saatchi & Saatchi and Deloitte are among some of the cloud-based team calendar's heavyweight customers.

05. ActiveCollab

ActiveCollab recently released its new version 5.0. The new revamped app is now more powerful and focused project management tool. It offers team collaborating features, task management, time tracking and importing expenses. One of the biggest assets of ActiveCollab is it offers invoicing features. You are able to track payments and expenses and have invoices paid directly within ActiveCollab with PayPal, and other credit card payments.

06. Zoho Projects

Zoho offers a wide range of business software including Projects. Zoho Projects is an proficient tool to project plan and project coordinator from start to finish. It boasts all the features you need for project management with some advanced features including reporting,

integration with Google Apps and Dropbox, bug tracking, setup Wiki Pages to build a repository of information, forums and more.

07. Jira

Jira is specifically targeted for software development teams. Jira offers abilities to raise issues and bugs. Jira makes it real easy to track bugs and see which issues are still outstanding and how much time was spent on each task. Jira offer other products including Confluence a document collaboration tool, and HipChat a team chat and video and file sharing platform and other products.

08. Asana

Asana is the easiest way for teams to track their work so everyone knows who's doing what, by when. With tasks, projects, conversations and dashboards, Asana keeps your work organized, and teammates accountable so you can move work forward faster. Asana also lets you keep track of your work wherever you are with mobile apps for both iOS and Android.

09. Podio

Podio is a ever growing tool to organise and communication tool for any business. Podio allows you to personalise this platform to fit your business needs. Besides being able to communicate with a team, setup task management, use as a file storage system, like a traditional project management app, Podio can be an internal intranet for all your colleagues and departments to interact.

10. Freedcamp

Whatever your project may be, either setting up an event, a web project or organising a wedding, Freedcamp helps you organise and plan effectively. Freedcamp has an organised dashboard to view the entire project at a glance. You can easily setup tasks, use sticky notes to visually setup tasks and organise them into the calendar. Freedcamp provides advance add-ons for high level business use including CRM, invoicing, issue tracking and setting up wiki pages.

11. Wrike

Wrike is advance application to help you work smarter. By making sure you are always staying on track and ensure you have the adequate resources to finish on time and on budget. Setting up tasks, engage your team and integrate with your business tools including Google Apps, Microsoft Excel, Dropbox and many more is so easy with Wrike.

PO and Their Relevance to project

PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

In this project creation process engineering knowledge of the software engineering and Electronics engineering have been applied. we have used software engineering , HTML,xml, java , android , java script , php , j2ee, data base , oracle , my sql , mango and other programming language and database to the project. We have applied all above engineering subjects in our projects.

PO2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

In our projects we have identified an problem , once verified by the client we have worked to identify the solution using all of our theoretical and practical knowledge.

PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

In the project development we have applied Integrated Development Environment IDE for the rapid development of the code, used web server for the software development.

PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

In 1961, the Conference of Engineering Societies of Western Europe and the United States of America defined "professional engineer" as follows.

A professional engineer is competent by virtue of his/her fundamental education and training to apply the scientific method and outlook to the analysis and solution of engineering problems. He/she is able to assume personal responsibility for the development and application of engineering science and knowledge, notably in research, design, construction, manufacturing, superintending, managing and in the education of the engineer. His/her work is predominantly intellectual and varied and not of a routine mental or physical character. It requires the exercise of original thought and judgement and the ability to supervise the technical and administrative work of others. His/her education will have been such as to make him/her capable of closely and continuously following progress in his/her branch of engineering science by consulting newly published works on a worldwide basis, assimilating such information and applying it independently. He/she is thus placed in a position to make contributions to the development of engineering science or its applications. His/her education and training will have been such that he/she will have acquired a broad and general appreciation of the engineering sciences as well as thorough insight into the special features of his/her own branch. In due time he/she will be able to give authoritative technical advice and to assume responsibility for the direction of important tasks in his/her branch.

PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

Sustainability is the ability to continue a defined behavior indefinitely. Sometimes environmental, social and economic are termed to be the three pillars of sustainability.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice

The ethics of engineers and the fundamental principles for Engineers are as follows.

Engineers uphold and advance the integrity, honor and dignity of the engineering profession by:

- I. using their knowledge and skill for the enhancement of human welfare;
- II. being honest and impartial, and servicing with fidelity the public, their employers and clients;
- III. Striving to increase the competence and prestige of the engineering profession; and
- IV. Supporting the professional and technical societies of their disciplines.

PO9. Individual and team work: Function effectively as an individual and as a member or leader in diverse teams, and in multidisciplinary settings.

To work successful in team a team member must have following capabilities.

1. The Ability to Listen

it is important to listen to one another's ideas. Too often in a business setting, you have a group of people simply waiting for their turn to speak, not paying one iota of attention to the persons on their left or right. So it is a good teamwork skill to have the ability to listen

2. Check Your Ego

This isn't saying abandon your ego all together, because that isn't healthy. But leaving your ego at the door temporarily is a very important team work skill. The reason this is so essential is because there is always someone better than you at something, no matter how brilliant you are.

3. Critique

By critique, I mean constructive criticism. Be able to give others constructive criticism and be able to listen to others critique your ideas and work. There shouldn't be any offense taken to constructive criticism. You all want to succeed, and this is a vital step in doing so.

4. Delegation

The mentality must be applied to teamwork. Delegate roles to those who do them best.

5. Show Respect

If you and another person happen to be paired up and can't stand each other, you can still put that aside for a couple of hours, treat each other civilly, and complete the tasks at hand. You may even overcome the dislike toward one another.

6. Be Helpful

This is simple. If one of your teammates does not understand an idea, discussion, or task that is being completed, take the necessary time to explain it to them and work with them. There are no weak links when everyone helps one another. Some take longer to learn than others, but that doesn't mean that they are of less intelligence. If in a meeting someone asks a question because they don't understand, don't frown at them. Just answer the questions patiently and concisely.

7. Question One Another

If someone brings up a topic of discussion and a solution to this topic, question them. Respectfully question, don't badger. Rather, ask them how it will work, why it will work over the long-run, and how everyone else can implement the idea.

8. Participation

Have the entire team encourage shy people to engage in the topics of discussion. Don't

demand it, but make them realize that you really want to hear their ideas.

9. Rational Debate

Bad ideas are bad for teams. Spirited, friendly, rational debate is where facts come forward, ideas are born, and quality rises to the top.

10. Set The Right Environment

Try to make the space in which your team is assembled as comfortable, relaxing, and inviting as possible. You do not want your team to be tense and with frayed nerves.

PO 10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

Project management is the application of processes, methods, knowledge, skills and experience to achieve the project objectives. In general project is a unique, transient endeavour, undertaken to achieve planned objectives, which could be defined in terms of outputs, outcomes or benefits.

PO12: Life-long learning: Recognize the need for and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

Life Long Learning means is the provision or use of both formal and informal learning opportunities throughout people's lives in order to foster the continuous development and improvement of the knowledge and skills needed for employment and personal fulfillment

CHAPTER 4

PROJECT IMPLEMENTATION

(Each Spring Backlog of 13-17 Pages total Chapter Size 50-70 pages)

1. Sprint Backlog-1

(**Project Design , Algo ,Database Design , ERD , Project Code (Sample code only Limited to Max of 2-3 Page if needed , Project Screen Shots)**)

2. Sprint Backlog-2

(**Project Design , Algo ,Database Design , ERD , Project Code (Sample code only Limited to Max of 2-3 Page if needed , Project Screen Shots**)

3. Sprint Backlog-3

(**Project Design , Algo ,Database Design , ERD , Project Code (Sample code only Limited to Max of 2-3 Page if needed , Project Screen Shots**)

4. Sprint Backlog-4

(**Project Design , Algo ,Database Design , ERD , Project Code (Sample code only Limited to Max of 2-3 Page if needed , Project Screen Shots**)

CHAPTER 5

CONCLUSION

Results

An IoT system has been built which can assist farmers in farming.

Conclusion

IoT based smart farming system can prove to be very helpful for farmers since it will help them to know about soil their want to use for farming. Threshold values for climatic conditions like humidity, temperature, moisture can be fixed based on the environmental conditions of that particular region. This system generates temperature value, soil fertility, moisture in surrounding which can be compared with standard one to check if soil is suitable for farming or not.

Future Scope

This system can be used for various purpose such as warning farmers about unauthorized entry in their farm. This system can help them to control their motor for irrigation even if they are far from their field. This system can inform them about the fertility of their soil. This system can inform them for how long they can store their crops without getting rot.

ANNEXURES

References

Research Paper (if Presented and approved for publication)

DST Document presented for grants.

CV

Instructions

For Chapter Heading

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For Paragraph Heading

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