PROJECT DESIGN PHASE - I

Date	24 September 2022
Team ID	PNT2022TMID11578
Project Name	Project - Smart Farmer - IoT Enabled Smart Farming Application
Maximum Marks	2 Marks

Proposed Solution Template:

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

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Farmers are under pressure to produce more food AND use less energy and water in the process. A remote monitoring and control system will help farmers deal effectively with these pressures.
2.	Idea / Solution description	Smart Farming has enabled farmers to reduce waste and enhance productivity with the help of sensors (light, humidity, temperature, soil moisture, etc.) and automation of irrigation systems. Further with the help of these sensors, farmers can monitor the field conditions from anywhere. Internet of Things based Advanced Farming is highly efficient when compared with the conventional approach. The applications of intelligent Agriculture solutions not only targets conventional, large farming. With operations, but could also be new levers to uplift other growing or common trends in agricultural like organic farming, family farming (complex or small spaces, particular cattle and/or cultures, preservation of specific or high-quality varieties, etc.), and enhance highly transparent Farming.
3.	Novelty / Uniqueness	• Internet facility will serve 24/7 without any intereption. • No overuse of machines can damage the environment • Driverless agriculture machine is a liability to access the technology.

4.	Social Impact / Customer Satisfaction	Smart farming also has the potential to boost youth involvement in agriculture. In pursuing the fourth industrial revolution and 'agriculture 4.0', social impact as a result of the new technologies need to be taken into account. Rose et al. (2021) suggested that agriculture 4.0 should be guided by the concept of sustainable intensification (SI) for the benefits are enjoyed by people, production and the planet. An important issue which needs to be addressed is the ageing farmers. This is a worldwide phenomenon including countries in ASEAN therefore, getting the youth involved in farming is crucial. These emerging new technologies can help demonstrate to youth that agriculture can be a viable and profitable business opportunity which can increase the desirability of agriculture-related careers. Engaging youth in agriculture will enable them to bring innovative and tech-savvy perspective to solving some of the most difficult problems in agriculture.
5.	Business Model (Revenue Model)	• Subscription model • Pay-per-use business model • Output or performance-based model • Asset- sharing model • Door-opener model
6.	Scalability of the Solution	The challenges related to scalability in smart farming fall into two categories: capacity and performance.Scaling capacity refers to the ability to add new nodes or resources to the system .Scaling performance is the ability to improve performance or to keep the performance identical while expanding capacity. The fundamental bottleneck that may affect system performance may be caused by different deployment configurations of various components. Other challenges of scalability are identity

		management and access control, security, privacy, governance, and fault tolerance. Since farming data generation is rapidly increasing every day, such data are too large to be stored on a single node. A fundamental solution to address this need is distributing data collection mechanisms across multiple nodes. For instance, Zhou et al. employed Hadoop to process and store 1.44 million data records for daily temperature monitoring. Since most smart farming data are small files that lead to many small files, Hadoop cannot be effective without a distributed system equipped with a high-performance computing system. To address this problem, the Hadoop Distributed File System (HDFS) has been designed to process large (and small size) datasets. Using cloud computing technology in a smart farming platform is another solution that can address scalability challenges related to capacity due to flexible and robust data collection, management, and processing capabilities. Cloud computing provides a high level of flexibility by providing remote services for monitoring and managing farm data. Moreover, these services can provide on-demand storage and computation resources with no need for on-farm hardware installation . The data stored in the cloud systems are usually distributed in the data storage platforms supported by backup mechanisms. The data-driven services are finally offered by web services accessible through diverse tools, including laptops, tablets, and smartphones in the last stage of smart farming tasks, as shown in Figure 1. SmartFarmNet is an example of a scalable platform that utilizes cloud computing technology to provide a scalable solution for smart farming.