SMART FARMER – IOT ENABLED SMART FARMING APPLICATION

BRAINSTORMING AND IDEATION

SMART FARMING:

By using IoT sensors to collect environmental and machine metrics, farmers can make informed decisions, and improve just about every aspect of their work – from livestock to crop farming.

PROBLEM STATEMENTS:

SI.NO	TITLE	EXPLANATION
IDEA-1	Monitoring of climate conditions	Probably the most popular smart agriculture gadgets are weather stations, combining various smart farming sensors. Located across the field, they collect various data from the environment and send it to the cloud. The provided measurements can be used to map the climate conditions, choose the appropriate crops, and take the required measures to improve their capacity (i.e. precision farming).
IDEA-2	Greenhouse automation	Typically, farmers use manual intervention to control the greenhouse environment. The use of IoT sensors enables them to get accurate real-time information on greenhouse conditions such

		as lighting, temperature, soil condition, and humidity.
		In addition to sourcing environmental data, weather stations can automatically adjust the conditions to match the given parameters. Specifically, greenhouse automation systems use a similar principle.
IDEA-3	Crop management	One more type of IoT product in agriculture and another element of precision farming are crop management devices. Just like weather stations, they should be placed in the field to collect data specific to crop farming; from temperature and precipitation to leaf water potential and overall crop health.
		Thus, you can monitor your crop growth and any anomalies to effectively prevent any diseases or infestations that can harm your yield.
IDEA-4	Cattle monitoring and management	Just like crop monitoring, there are IoT agriculture sensors that can be attached to the animals on a farm to monitor their health and log performance. Livestock tracking and monitoring help collect data on stock health, well-being, and physical location.
		For example, such sensors can identify sick animals so that farmers can separate them from the herd and avoid contamination. Using drones

		for real-time cattle tracking also helps farmers reduce staffing expenses.
IDEA-5	Precision farming	Also known as precision agriculture, precision farming is all about efficiency and making accurate data-driven decisions. It's also one of the most widespread and effective applications of IoT in agriculture. By using IoT sensors, farmers can collect a vast array of metrics on every facet of the field microclimate and ecosystem: lighting, temperature, soil condition, humidity, CO2 levels, and pest infections. This data enables farmers to estimate optimal amounts of water, fertilizers, and pesticides that their crops need, reduce expenses, and raise better and healthier crops.
IDEA-6	Agricultural drones	Perhaps one of the most promising agritech advancements is the use of agricultural drones in smart farming. Also known as UAVs (unmanned aerial vehicles), drones are better equipped than airplanes and satellites to collect agricultural data. Apart from surveillance capabilities, drones can also perform a vast number of tasks that previously required human labor: planting crops, fighting pests and infections, agriculture spraying, crop monitoring, etc.

IDEA-7	Predictive analytics for smart farming	Precision agriculture and predictive data analytics go hand in hand. While IoT and smart sensor technology are a goldmine for highly relevant real-time data, the use of data analytics helps farmers make sense of it and come up with important predictions: crop harvesting time, the risks of diseases and infestations, yield volume, etc. Data analytics tools help make farming, which is inherently highly dependent on weather conditions, more manageable, and predictable.
IDEA-8	End-to-end farm management systems	A more complex approach to IoT products in agriculture can be represented by the so-called farm productivity management systems. They usually include a number of agriculture IoT devices and sensors, installed on the premises as well as a powerful dashboard with analytical capabilities and in-built accounting/reporting features. This offers remote farm monitoring capabilities and allows you to streamline most of the business operations.

ADVANTAGES:

- Data, tons of data, collected by smart agriculture sensors.
- Better control over the internal processes and, as a result, lower production risks.
- Cost management and waste reduction thanks to the increased control over the production.
- Increased business efficiency through process automation.
- Enhanced product quality and volumes.

CHALLENGES:

- Hardware
- Brain
- Maintenance
- Mobility
- Infrastructure
- Connectivity
- Data Collection Frequency