



# UTM

UNIVERSITI TEKNOLOGI MALAYSIA

SECJ3553 - SEC 16  
Artificial Intelligence  
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Progress-3  
**Agriculture - AgriNINE.11**

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## **1. Intelligent Agent – PEAS Model: -**

**Proposed AI System (AgriNINE-11 Smart Agriculture Decision Support System):** - AgriNINE-11 is an AI agent that helps farmers make accurate, efficient and better choices for farming. The system monitors farm conditions and uses reason and previous data to make appropriate actions related to soil nutrients, crop selection, and irrigation.

## **2. PEAS Model:-**

The PEAS model defines:

- a. What the agent is trying to achieve
- b. Where it operates
- c. How it perceives information
- d. How it acts on decisions

## **3. Detailed PEAS Formulation for AgriNINE-11: -**

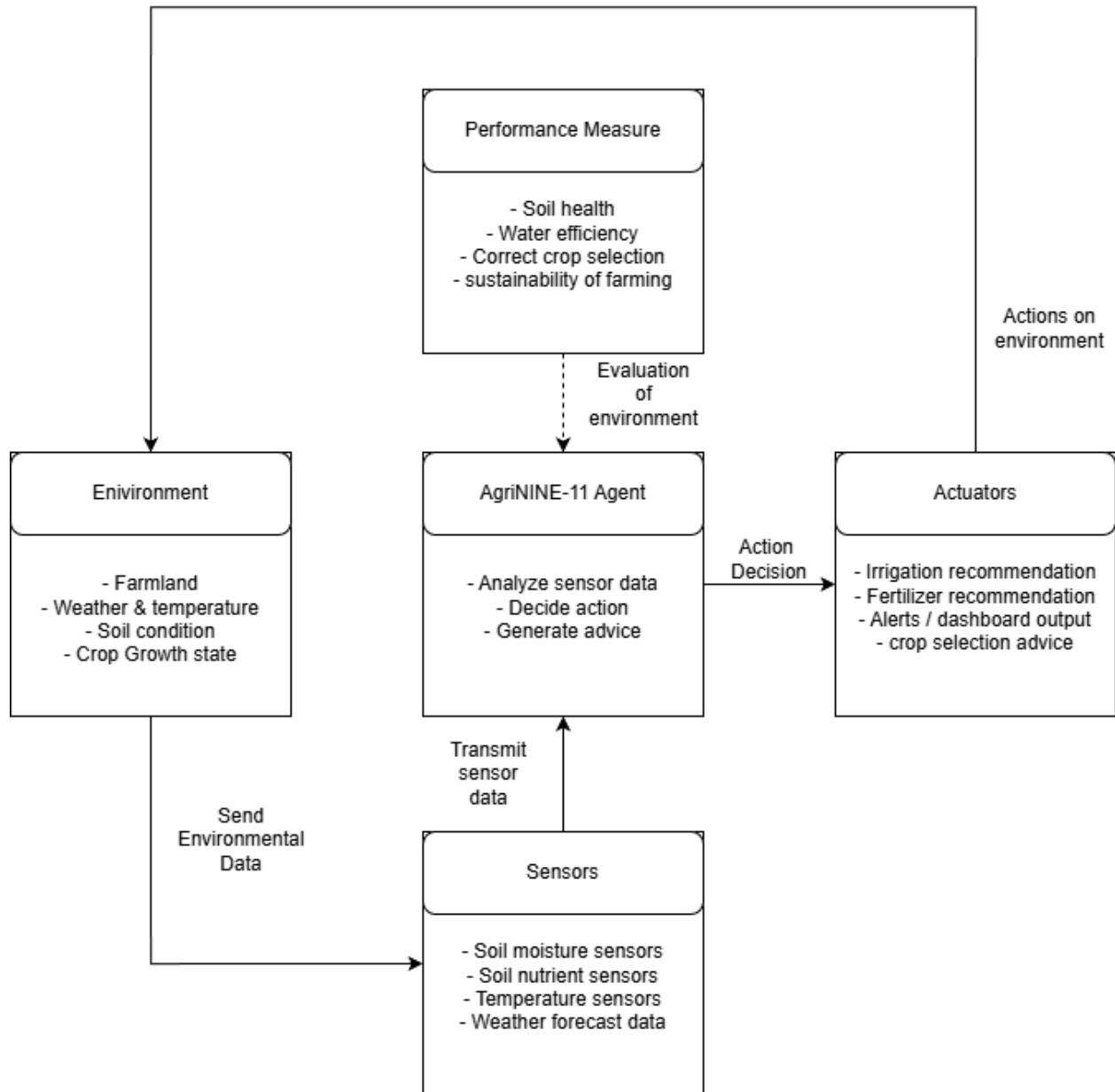
- 1. P – Performance Measure:** -AgriNINE-11 performs good when its suggestions help farmers keep the soil healthy, choose the right crops for the field, and use water only when it is necessarily needed. The system is considered valuable when it assists cost-saving and environmentally friendly farming practices, while reducing the risk of crop damage or failure. In simple

terms, if the farm remains sustainable, safe, and healthy, then the agent is performing successfully.

- 2. E – Environment:** - It refers to the environment where the agent operates. The farmland where crops are grown, the state of the soil, the weather and temperature, and the general circumstances of crop development are all considered aspects of the environment for AgriNINE-11. In order for the system to make accurate and timely judgements, it must continuously monitor these variables as they change over time.
- 3. A – Actuators (Effectors):** - it basically refers to how the agent takes action. Farming equipment is not directly under the supervision of AgriNINE-11. Rather, it helps farmers by making specific recommendations, such as what kind of fertilizer to use, what crops are appropriate for the current field conditions, and if the field should be watered, allowed to dry, or only watched.
- 4. S – Sensors :** - Sensors allow the agent to understand what is happening on the farm. AgriNINE-11 combines data from temperature readings, weather forecasts, soil moisture data, and soil nutrient readings to determine the farm's current state. The system uses

this data to determine what has to be done to maintain the health of the crops and the farm's management.

#### 4. Relationship Between PEAS Components Diagram:-



The figure represents the communication between the PEAS components of the AgriNINE-11 intelligent agent. The sensors are used to collect environmental information about the farmland and send it to the agent who will later interpret the result and make decisions. The actuators produce recommendations created by the agent and affect the environment. Performance measures can be used to measure the results and give feedback in order to have efficient, accurate and sustainable farming decisions.

## **5. How the Agent Works (Simple Flow): -**

- Sensors collect soil and weather data
- The agent checks the current condition
- It decides the best action based on its knowledge
- Recommendations also provided

**6. PEAS in the Proof of Concept (POC): -** The Proof of Concept (POC) is used to show how the AgriNINE-11 intelligent agent works in a simple and practical way.

1. **Performance Measure in the POC:** - Performance in the POC is evaluated by determining if the decisions made by the system result in appropriate and safe farming conditions.
2. **Environment in the POC:** - The environment in the POC refers to a real farm situation, but in a simplified form.
3. **Actuators in the POC:** - Actuators in the POC are represented as the output decisions given by the system.
4. **Sensors in the POC:** - Sensors in the POC are shown as input data given to the system.

## **7. How the AI Agent Behaves in AgriNINE-11:-**

AgriNINE-11 behaves as a goal-based intelligent agent:

- It observes the field using sensors
- It reasons using Knowledge Representation and state-space models
- It choose the best and optimal action
- It continuously monitors and adapts to changes