Assignment 2: Develop a case study analyzing the implementation of SDLC phases in a real-world engineering project. Evaluate how Requirement Gathering, Design, Implementation, Testing, Deployment, and Maintenance contribute to project outcomes.

This case study analyzes the implementation of SDLC phases in the development of a smart irrigation system for a large agricultural farm.

**1. Requirement Gathering:**

* Meetings with farmers identified needs: water conservation, reduced labor, improved crop yield.
* Sensor data on soil moisture, weather patterns collected.
* System functionalities defined: automated watering based on sensor data, remote monitoring capabilities.

**2. Design:**

* System architecture created: network of moisture sensors, central control unit, mobile application.
* Hardware components chosen based on durability and weather resistance.
* Software designed for user-friendly interface, data analysis, and secure communication.

**3. Implementation:**

* Developers coded the software for the control unit and mobile app.
* Hardware components were integrated and tested for functionality.
* Security protocols implemented to protect data transmission.

**4. Testing:**

* Unit testing ensured individual components functioned correctly.
* Integration testing verified seamless communication between components.
* System testing evaluated overall functionality in a simulated farm environment.
* Field testing with real crops monitored system performance and identified potential issues.

**5. Deployment:**

* The system was installed on the farm, with sensors strategically placed.
* Farmers received training on operating the mobile app and system functionalities.
* System was monitored remotely for any glitches or malfunctions.

**6. Maintenance:**

* Regular software updates addressed bugs and improved functionalities.
* Sensor calibration ensured accurate moisture readings.
* System performance was monitored to optimize water usage and crop yield.