**B.Tech(ECE)**

**Task3- Imagine you need to develop a product for new startup company**

**Waterfall Development Model for a Smart Water Bottle**

**Phase 1: Requirements Gathering & Analysis**

In this phase, we gather all the necessary information and define the **requirements** for the smart water bottle. This involves researching the target market, understanding customer needs, and defining the product’s specifications.

* **Key Activities:**
  + Market research on health-conscious consumers.
  + Define user needs (e.g., hydration reminders, water temperature monitoring, connectivity to mobile apps, etc.).
  + Identify features (e.g., Bluetooth integration, LED indicators, mobile app sync, sensors to track water consumption).
  + Define performance requirements (e.g., battery life, durability, water resistance).
  + Develop a detailed **requirements document** that outlines everything the product should achieve.
* **Deliverable**: **Requirements Specification Document**.

**Phase 2: System Design**

Once we have the requirements, we move to the **system design phase**, where we figure out how the product will work and what technologies will be used to build it.

* **Key Activities:**
  + Define hardware components (e.g., sensors for hydration levels, temperature sensors, battery, Bluetooth module).
  + Design the **user interface (UI)** for the mobile app (hydration tracking, reminders, data logging).
  + Design the **product prototype**, focusing on the ergonomics of the bottle, the positioning of buttons, and the placement of sensors.
  + Create **wireframes** for the app and map out user flows.
  + Plan the **backend architecture** for storing hydration data (e.g., cloud storage for syncing data between the bottle and mobile app).
* **Deliverable**: **System Design Document**, **Prototypes**, **App Wireframes**.

**Phase 3: Implementation (Development)**

This is the phase where the actual development of the smart water bottle begins. We focus on both the hardware and software aspects of the product.

* **Key Activities:**
  + Develop the **hardware components** (e.g., create the physical bottle, install sensors, design the Bluetooth module integration).
  + Develop the **mobile app** (iOS/Android) that connects to the smart water bottle and tracks hydration, sends reminders, and displays real-time data from the sensors.
  + Ensure **software integration** for smooth interaction between the mobile app and the smart bottle’s sensors (e.g., syncing data, adjusting settings).
* **Deliverable**: **Developed Prototype of the Smart Water Bottle**, **Mobile App (Alpha Version)**.

**Phase 4: Testing**

Once the product has been developed, it’s time for **testing**. In this phase, we thoroughly test the product for both functionality and user experience.

* **Key Activities:**
  + **Unit Testing**: Test individual components (e.g., sensors, Bluetooth connectivity, app functionality).
  + **Integration Testing**: Test the interaction between hardware and software to ensure data is correctly synced.
  + **User Testing**: Have real users test the bottle and app, ensuring the hydration reminders and data tracking work seamlessly.
  + **Stress Testing**: Ensure the battery life and overall durability of the smart water bottle in real-life scenarios.
  + **Bug Fixes and Refinement**: Identify any issues and make necessary adjustments to both hardware and software.
* **Deliverable**: **Test Results Report**, **Bug Fixes**, **Updated Version of the Product**.

**Phase 5: Deployment (Launch)**

After the product has been tested and is functioning well, it’s time for **deployment**. This is where we make the product available to the public.

* **Key Activities:**
  + Finalize **production** (manufacturing the smart water bottles in bulk).
  + Prepare marketing materials, website, and launch plans.
  + Launch the product on **e-commerce platforms** and in physical stores.
  + Release the **final version** of the mobile app on app stores.
  + Provide **customer support** to handle any post-launch issues.
* **Deliverable**: **Launched Product (Smart Water Bottle)**, **Mobile App on App Store/Google Play**, **Marketing Campaign**.

**Phase 6: Maintenance & Support**

Even after launch, we continue to provide ongoing **maintenance** and **support** for the product.

* **Key Activities:**
  + Address **customer feedback** (e.g., feature requests, bug reports).
  + Release **software updates** to improve the app or fix bugs.
  + Offer **product repairs** or **warranty services**.
  + Monitor the product’s **performance** and make any necessary improvements (e.g., battery upgrades, hardware revisions).
* **Deliverable**: **Post-Launch Updates**, **Customer Support Services**.

