Time-Saving Smart Fishing Rod

- PI 1: GPIO

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Problem Def. - Proposed Sol.

- The amount of time and effort taken by fishing is a known consequence of traditional fishing methods that can be easily supported if wanted.[1]

- Our smart fishing rod automates bite detection by sensing strong vibrations on the fishing rod, activating a servo motor to hook the fish. Using our design, it distinguishes minor movements from bites, provides real-time updates, and alerts anglers of inactivity.[2]
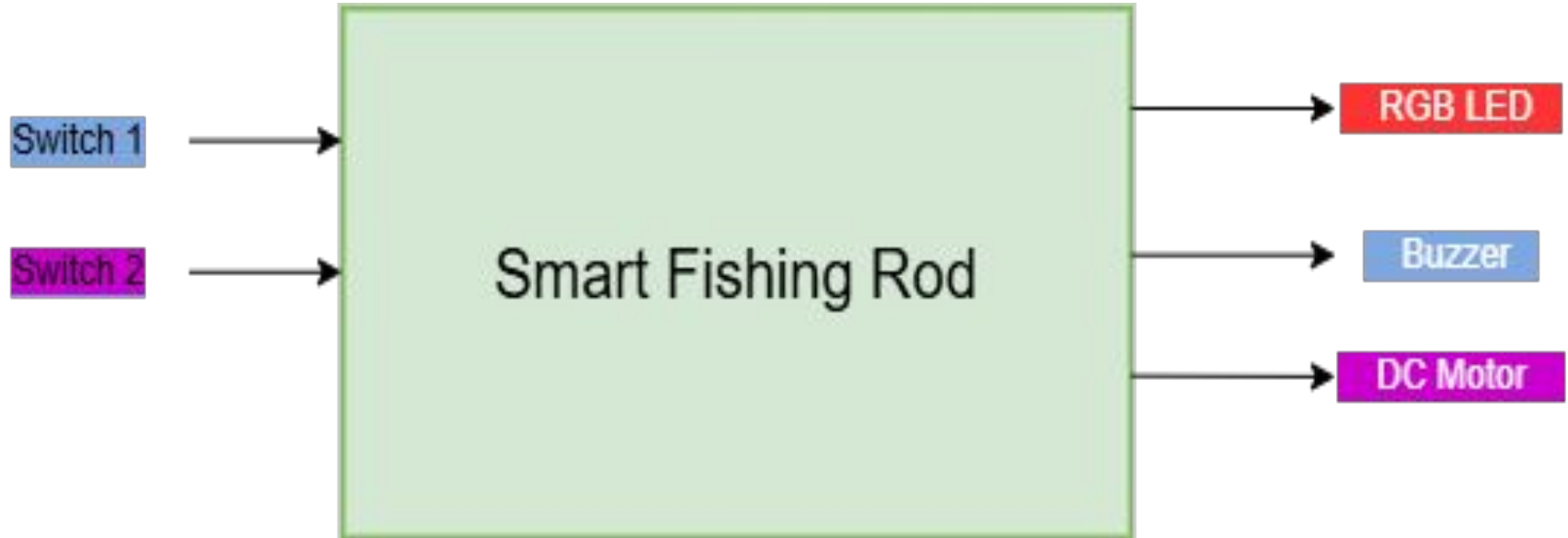
Partial Impl. - Description

- In this **GPIO PI** phase, the first switch simulates small bites, activating the buzzer, while the second switch represents strong bites, triggering the DC motor. This setup allows us to test both minor and major bite detection responses and validate system functionality using simulated inputs.

- In **GPIO PI**, the DC motor is also a placeholder for the servo motor, which will be implemented in the **Timer PI** for precise control. The vibration sensor will be integrated in the **IC/OC PI**, replacing the switches to complete real bite detection, and the active buzzer will be replaced by passive buzzer in the ADC PI for customizable alerts.
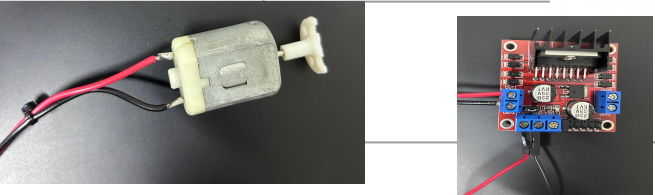
Partial Impl. - Relation

- This GPIO PI phase serves as a foundation for the system's overall functionality by establishing connections and basic controls among components, making it integral to subsequent PIs and the final integration phase. It provides simulated inputs for bite detection, which will inform the Timer PI in managing response timing and inactivity alerts, as well as the IC/OC PI for the processing actual vibration sensor inputs.

- In later stages, the ADC PI will supply voltage levels to help differentiate bite intensities, refining the GPIO's bite detection for precise responses. Shared variables, such as bite detection status and motor control flags, are maintained between the GPIO, Timer, and IC/OC PIs to coordinate motor activation and alert functions, ensuring the system operates smoothly as it transitions from simulation to full integration.

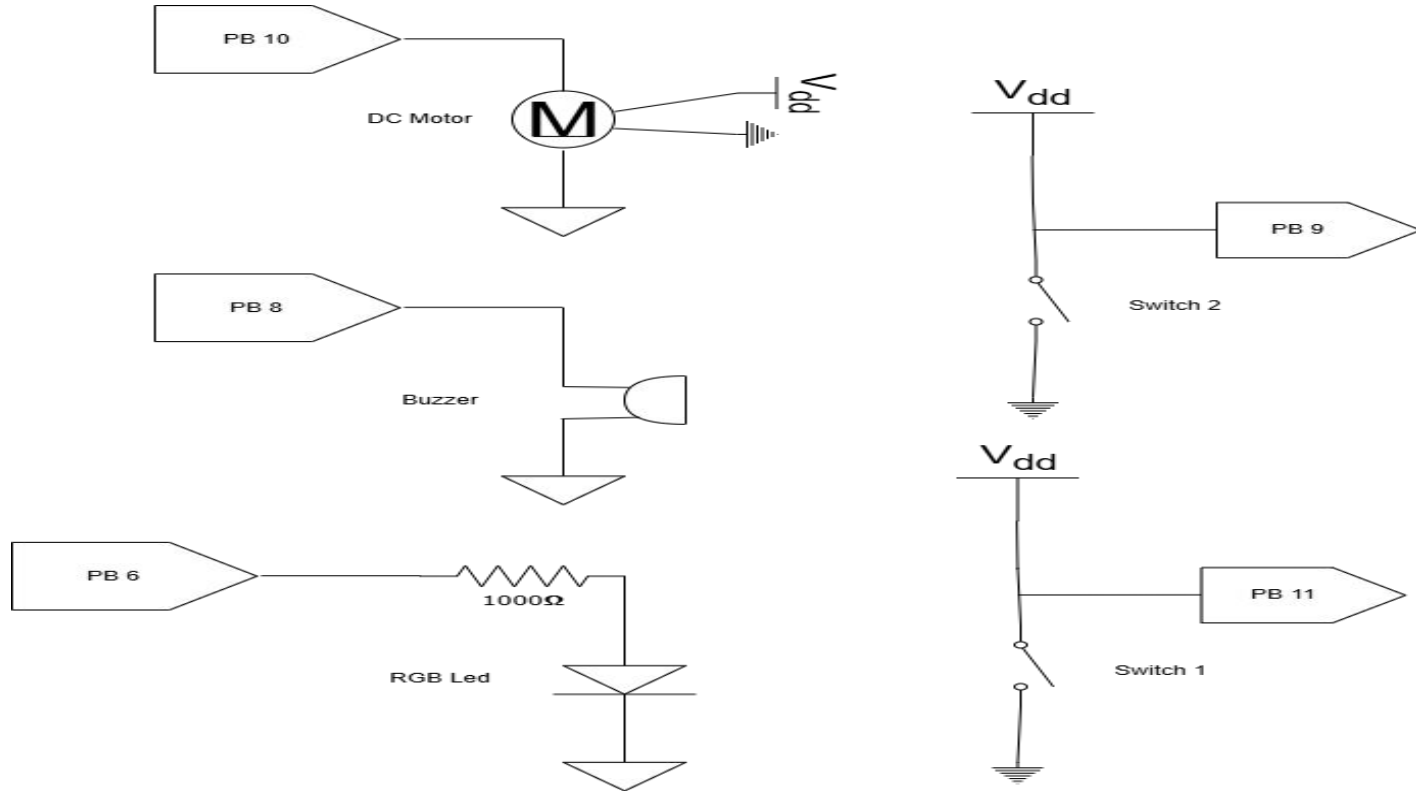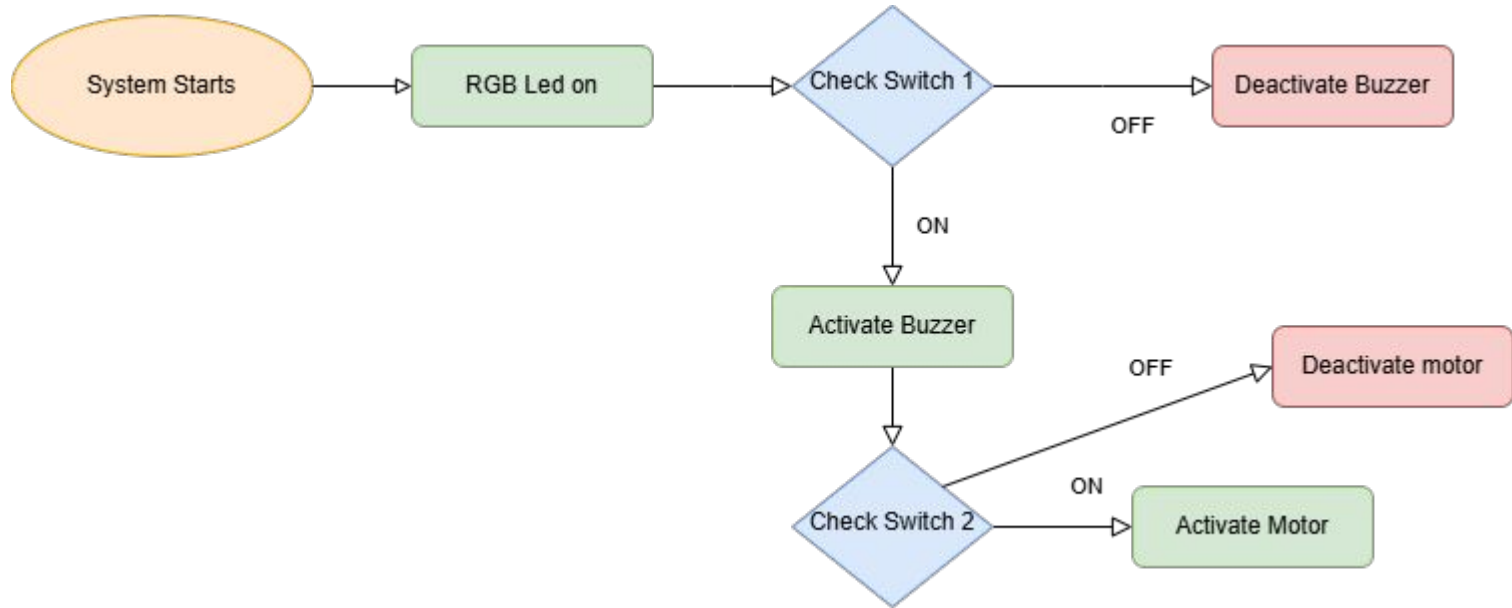# Partial Impl. - System Level Block Diagram

Switch 1 → Smart Fishing Rod → RGB LED

Switch 2 → Smart Fishing Rod → Buzzer

Smart Fishing Rod → DC Motor

Each Component planned to use in PI

Input Components	
Switch	
Switch	

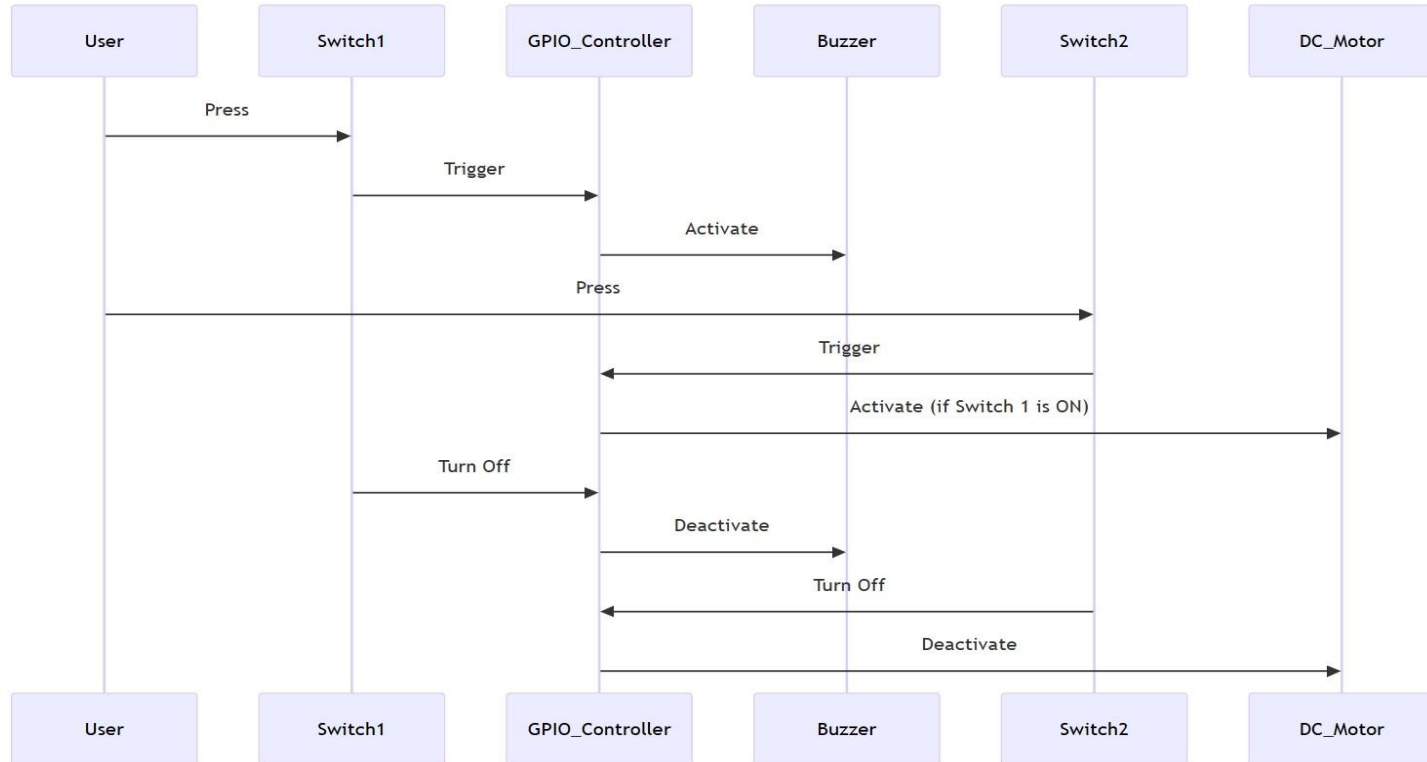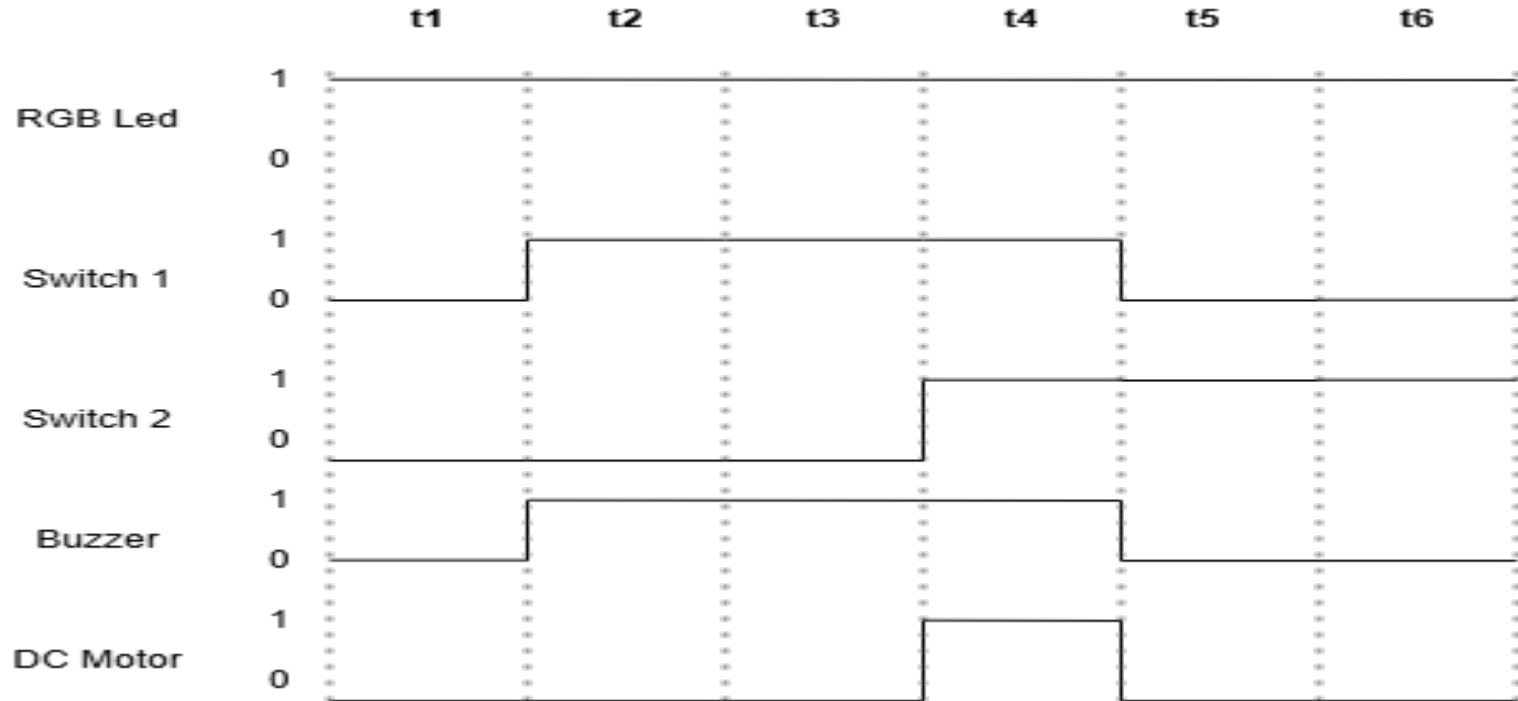| Output Components	
RGB Led - Common Cathode	
TMB12A05 active buzzer module	
DC Motor & L298N Driver	

Partial Impl. - Schematic Diagram

Partial Impl. - Flowchart

Partial Impl. - Sequence Diagram

Partial Impl. - Timing Diagram

References

- [1] , [2] Conceptual Design Presentation of Time-saving Smart Fishing Rod