

Smart Desk Clock

Purpose

The purpose of the Smart Desk Clock project is to create a convenient and intelligent smart desk clock. The project aims to combine smart features to provide more than just time information. The clock will be equipped with additional features such as notifications, sound adjustment, ambient temperature display, and the ability to interact with the user through an OLED screen and control buttons.

Features

The SmartDeskClock project includes the following features:

- 1. **Time and Temperature Display:** The clock will display the time (hours, minutes, seconds) and date on the screen along with the ambient temperature.
- 2. **Reminders and Notifications:** The clock can set timers, countdowns, reminder, and provide audio and RGB LED notifications when the specified time is reached.
- 3. **Entertainment:** Users can enjoy playing some simple built-in games on the clock, such as snake game.
- 4. **Computer Interaction Capability:** Users can interact with the clock through a computer to set the time, and perform firmware updates.

Required Modules

Module	Functionality
STM32F411RE	Main microcontroller for the clock
DS1307	Real-time clock module for timekeeping
SSD1306	Display module for showing information
CJMCU75	Temperature sensor module for ambient temperature
BUTTON	User interaction module for input
BUZZER	Audio module for notifications
LED RGB	Status indicator lights for the clock

Detailed Features

1. Time and Temperature Display

ID	Functionality	Note
01	Display Current Time On Screen	Display Year, Month, Day of Week, Day of Month, Hour, Minute, Second
02	Theme	Change background (Dark mode, Light mode) and font

ID	Functionality	Note
03	Display Temperature	Temperature in Celsius

2. Reminders and Notifications

ID	Functionality	Note
01	Setting Time	Set Year, Month, Day of Week, Day of Month, Hour, Minute, Second
02	Alarm	Set alarm time, choose type of event to trigger sound and LED blinking
03	Countdown	Set a duration of time to countdown, triggers sound and LED blinking when the countdown ends
04	Stopwatch	Start the stopwatch by pressing a button, press again to stop and display the elapsed time

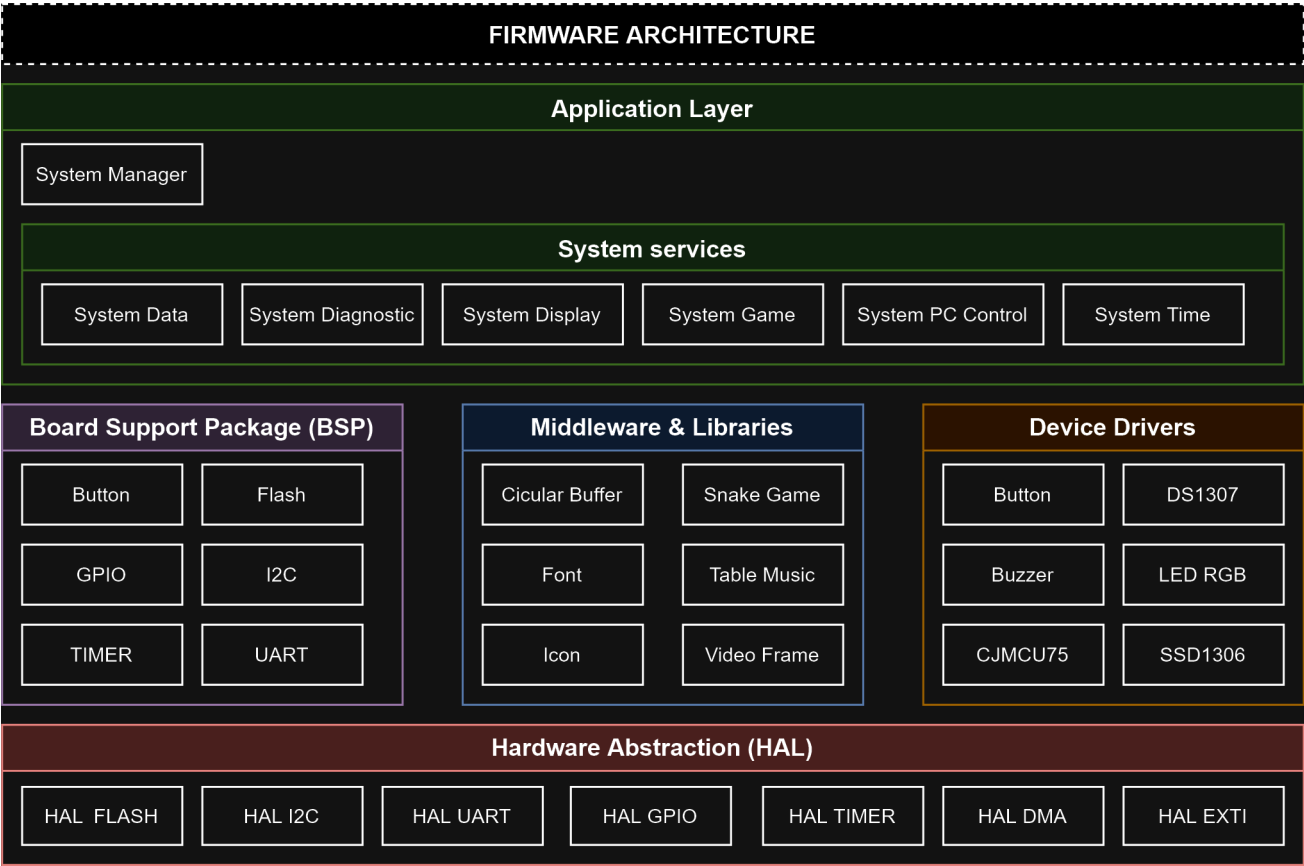
3. Entertainment

ID	Functionality	Note
01	Snake Game	User can use buttons to control snake eat food and get the score

4. Computer Interaction Capability

ID	Functionality	Note
01	Control clock use command	User can use COM app on PC to set time, reminder, song, led, theme, ...
02	Stream Video	User can display video from camera via UART

Firmware Architecture



Developer Team

- 1. **Tran Ngoc Hieu**
- 2. **Le Van Manh Quynh**
- 3. **Le Van Quy**