

Vision

Introduction

We envisioned a top of the line dual alarm clock radio, that can tell time, play music, and wake you up. A system that is very fault tolerant.

business opportunity

The current technology out there is exactly the same as what we have designed, but ours comes with an anti-Skynet guarantee.

Problem Statement

The old analog clocks had to be serviced often by professional clockmakers. The problem with analog is that it is inconsistent and doesn't always project the accurate time.

User-Level Goals

Owner: set alarms, set time, set time style (12-hour or 24-hour), set volume, set radio station, be able to see the time.

Summary of System Features

- tells time
- has two alarms
- plays radio stations

Use Case: Changing the Time

Scope: User-Goal Level

Primary Actor: Jim - Owner of the alarm clock

Stakeholders: Jim

Preconditions: The alarm clock must be plugged in and turned on.

Success Guarantee: The time set by Jim must be saved on the alarm clock.

Main Success Scenario: Jim approaches the alarm clock and realizes the time is incorrect. Jim changes the hours to the correct time. Jim changes the minutes to the correct time. Jim Repeats steps 2 and 3 until the time displayed on the front of the alarm clock is correct.

Extensions (Alternate flows): If at any time the alarm clock becomes unplugged the default time is 12:00. If the current minutes are 59 and another minute is added reset minutes to 00 and increment hours by 1. If the clock is set to a 12-hour clock and 1 hour is added at 12 o'clock then set the hours to 01. If the clock is set to a 24-hour clock and 1 hour is added at 23 o'clock then set the hours to 00.

Special Requirements: Clock must be visible during both day and night. Clock must be visible from 3m. In order to save time, alarm, and radio stations the clock must have a back up battery.

Technology and Data Variations List: Inputs are acquired through an assortment of buttons located all over the alarm clock. Output is through an LED display located on the front of the Alarm Clock. Antenna is able to receive radio frequencies.

Frequency of Occurrence: When the time displayed is incorrect which usually occurs due to power outage and no back-up battery is present.

Open Issues: Not able to keep track of the day Not able to keep track of daylight savings time.

Use Case: Changing the Radio Station

Scope: User-Goal Level

Primary Actor: Jim - Owner of the alarm clock

Stakeholders: Jim, people in the vicinity of the clock radio

Preconditions: The alarm clock must be plugged in and turned on.

Success Guarantee: The radio station set by Jim must be saved on the alarm clock.

Main Success Scenario: Jim Approaches the alarm clock, Jim sets the radio to his desired radio station. The alarm clock saves the radio station set by Jim.

Extensions (Alternate flows): The pre-programed frequencies are set between 88.0 and 106.9. When scrolling through the radio stations if the user is at 106.9 and increases the frequency any more it will reset to 88.0.

Special Requirements: Clock must be visible during both day and night. Clock must be visible from 3 meters. In order to save time, alarm, and radio stations the clock must have a back up battery. The radio should not be able to produce higher than 85 Decibels.

Technology and Data Variations List: Inputs are acquired through an assortment of buttons located all over the alarm clock. Output is displayed through an LED display located on the front of the Alarm Clock. Antenna is able to receive radio frequencies.

Frequency of Occurrence: Typically when the power is lost and there is no back up battery is present.

Open Issues: Not able to keep track of the day Not able to keep track of daylight savings time.

Supplementary Specification

1. Introduction

The purpose of this document is to define requirements of the dual-alarm clock radio that wasn't mentioned in the use cases. This includes the nonfunctional requirements, such as performance, design constraints, documentation, application standards, etc.

2. Functionality

2.1. Clock functions

- The clock's time should be on 12-hour or 24-hour intervals.
- It must display the correct number of hours and minutes.
- The user should be able to set the time.
- The LED display must be visible to user.

2.2. Alarm Functions

- The user must be able to set alarm.
- The alarm must have settings to save and delete alarm times.
- The alarm must have an ON/OFF switch.
- The alarm must go off at the given time set by the user.
- Sound from the alarm should be heard from at least 9 feet away.
- Only two alarms at most should be saved at a time.
- Snooze button needs to stop the sound of the alarm.
- Alarms needs to sound again after 10 minutes if switch is still set to ON.

2.3. Radio Functions

- The user must be able to change radio stations.
- The radio must have a FM/PM switch.
- The radio's antenna must receive radio waves.

3. Usability

3.1. The user will be able to see the large display of the time on the clock radio. The display should be visible 3 meters away. **3.2.** The user will be able to adjust the sound of the alarm and/or radio to their ideal volume. **3.3.** The user will be able to change the

time, alarms, and radio stations. **3.4.** The user will be able to use switches that control the alarm and radio functions.

4. Reliability

4.1. If the dual-alarm has no power source, a backup battery can be inserted and used up to 4 months. **4.2.** Time will maintain accuracy.

5. Performance

5.1. The time of the clock should maintain reliability. It needs to be within a 5 second interval with the operating system clock.

6. Implementation Constraints

6.1. Java classes will be used to implement design. **6.2.** Test-driven development will be used.

Glossary

dual-alarm clock radio- a clock that displays time, has two alarms, and also includes a radio.

clock- a mechanical or electrical device for measuring time, indicating hours, minutes, and sometimes seconds, typically by hands on a round dial or by displayed figures.

time- an ongoing sequence that is measured using seconds, minutes, hours, days, weeks, months and years.

radio- the transmission and reception of electromagnetic waves of radio frequency, especially those carrying sound messages.

antenna- or aerial, is an electrical device which converts electric power into radio waves.

alarm- a clock with a device that can be made to sound at the time set in advance, usually used to wake someone up.

LED display- a flat panel display, which uses an array of light-emitting diodes as pixels for a video display.

---Definitions came from Wikipedia.---