

Software Requirement Specification

Bedrock TV Alarm Clock System

Style	0/5	Section 2	2.1	3/4	(10)
Format	0/5		2.2	1.5/4	
Section 1	1.1 1/1		2.3	3/4	
	1.2 1/1		2.4	5/1	
	1.3.5/1	(4.5)	2.5	1/1	
	1.4 1/1		2.6	1/1	
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			3.6	1/1	
no Q&A included in document as per assignment		Appendix	Sample SRS	5/5	
			Q&A	0/20	

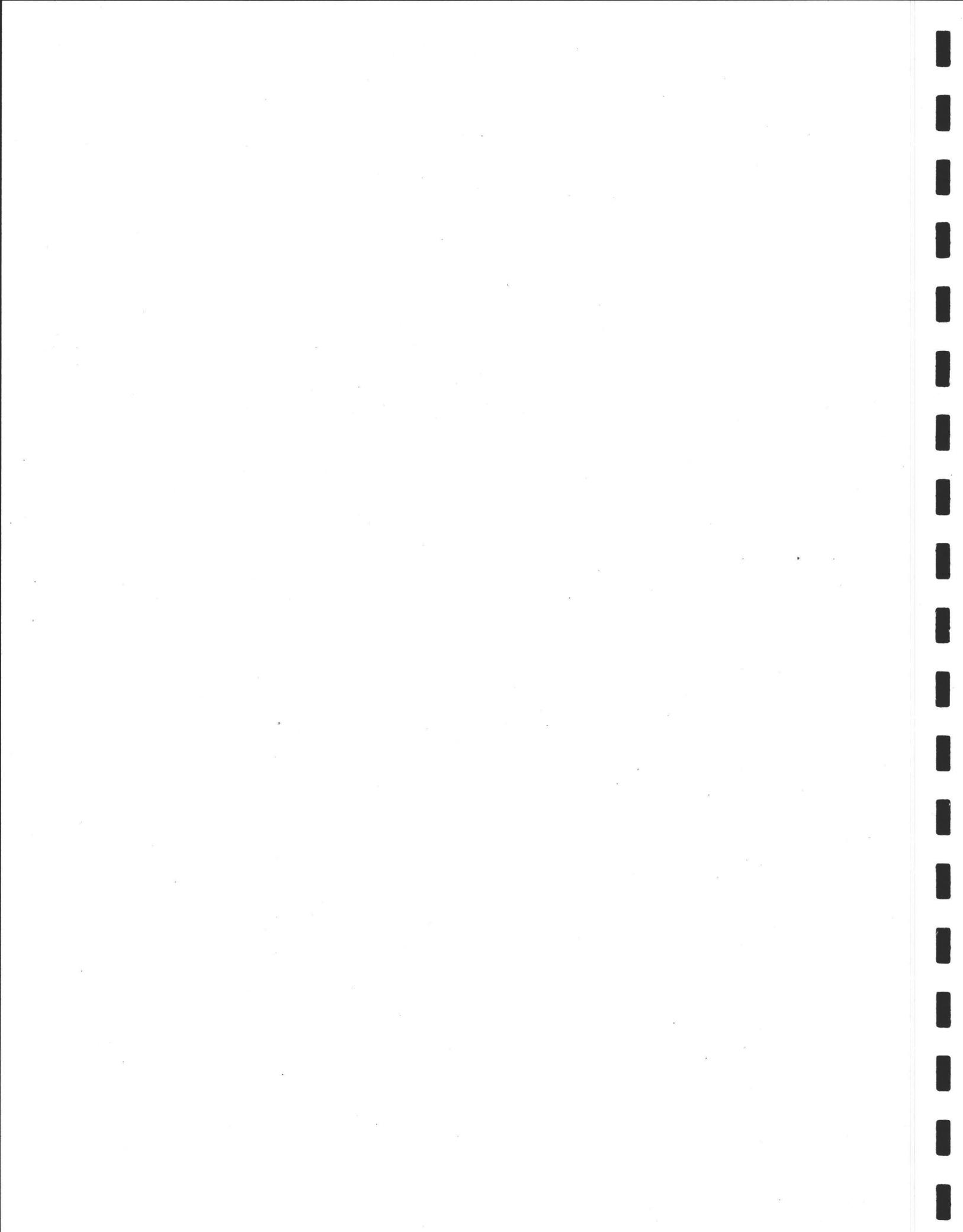
Date of Submission: 2012-11-2

Document Revision: Revision A

Show them to
me & you can
receive 10/20
for them now

Observations 7.75/10

44.75/100



Revision History



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page numbers?

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appendices?
where is the index?
↳ found it buried
in document

1. Introduction

1.1 Purpose

This Software Requirements Specification provides a complete description of all the functions and specifications of Bedrock TV and Electronics clock radio systems. It will explain the purpose and features of the system, the interfaces of the system, what the system will do, and how it reacts to user input. This document is intended for both stakeholders of Bedrock Tv and Electronics and the developers of the system.

1.2 Scope

This software system will be a user interface for the next generation of clock radios by Bedrock TV and Electronics. This system will be designed so that it redefines waking up in the morning. It will have all normal functionality of conventional AM/FM clock radios, but it will also have a small display that will be used to show the time and other status information normally. This small display will allow the user to navigate through menus to change settings very easily, in comparison to holding down button combinations on a conventional clock radio. This design promotes a better user experience and adds the ability to customize settings.

More specifically, this system is designed to allow the user to customize alarm and radio settings.

This software will give the user a flexible and easy to use experience, by using separate menu screens for alarms, radio presents, and time/date. There will be a large number of alarms that are settable. The software has the ability to adjust the volume, radio station, and date/time that each alarm will go off. This allows the user to customize their own waking up experience by giving them complete control over their settings and allows them to program an alarm months out so, they will never wake up late again.

1.3 Definitions, acronyms and abbreviations

Term	Definition
D-Pad	The directional buttons on the clock's remote
Function	A feature of the clock systems that allows the user to perform an action.
Software Requirements Specification	A document that completely describes all of the functions of a proposed system and the constraints under which it must operate. For example, this document.
Stakeholder	Any person with an interest in the project who is not a developer.
Stand by Screen	The main screen that displays basic information and waits for user input.
User	The person, or persons, who operate or interact directly with the product.
User Interface	The means by which the user and a computer system interact, in particular the use of input devices and software

RF page 27 for example

1.4 References

IEEE. IEEE Std 830-1998 IEEE Recommended Practice for Software Requirements Specifications. IEEE Computer Society, 1998.

Martin Robillard. (2001). *Time Monitoring Tool Software Requirements Specification*. Available: http://www.upedu.org/templates/cs/REQ/upedu_ex_srs.pdf. Last accessed 1st Nov 2012.

Style -2

1.5 Overview

The next chapter, the Overall Description section, of this document gives an overview of the functionality of the product. It describes the general factors that affect the product and its requirements. It is used to establish a context for the technical requirements specification in the next chapter.

consistent terms
The third chapter, Requirements Specification section, of this document is written primarily for the developers. It describes in technical terms the details of the functionality of the product and all of the requirements that must be satisfied by the software.

Both sections of the document describe the same software product, but are intended for different audiences and use different terms, language, and amounts of detail.

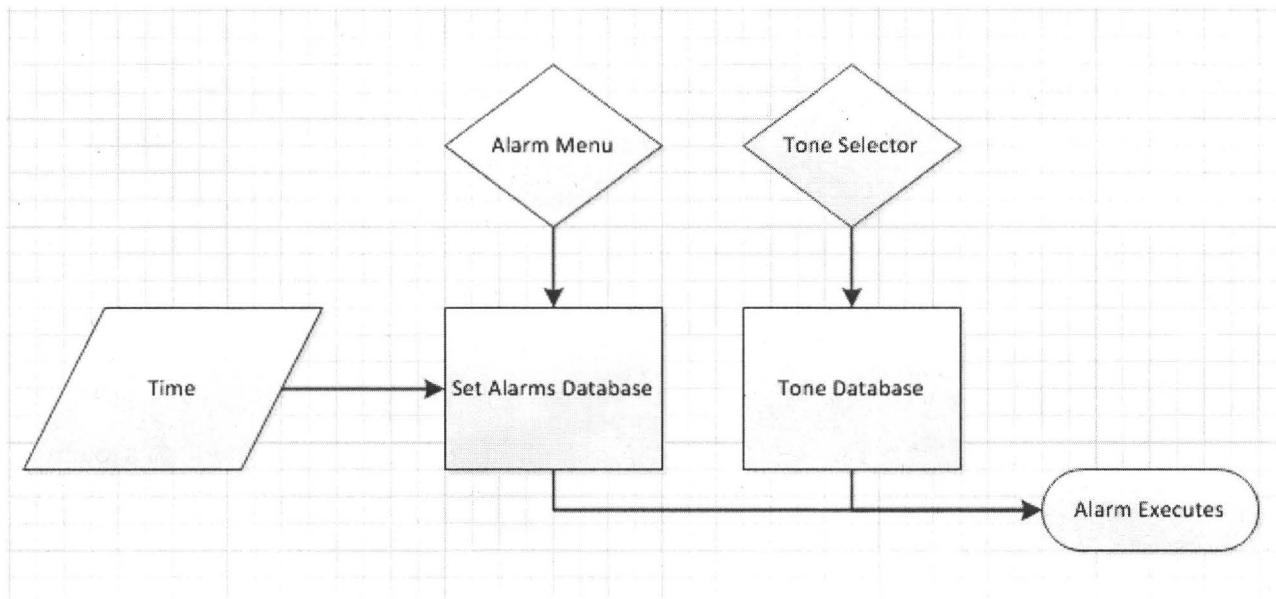
2. Overall description

2.1 Product perspective

This product is a stand-alone alarm clock system, though a considerably more advanced one. It is configured through an external remote and it has an external programming interface to extend its functionality through third party accessories such as a bed occupancy sensor.

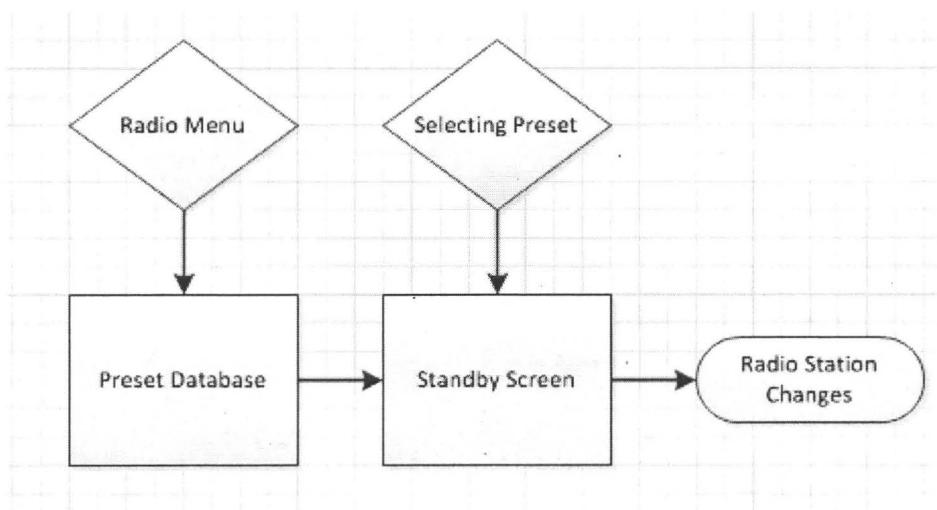
2.1.1 System interfaces

System interfaces
are totally external systems (eg:
banking network, GPS network, ...)
- the clock has no system interfaces



The alarm is set and loaded from the Alarm menu into the alarm database. The tone is also set and loaded into the tone database. Once the time matches the entry in the alarm database, the tone is pulled from the tone database that the alarm is executed

- I like the mention
of PBase
- save for
section 3, 4



The presets are loaded into the preset database in the radio menu. When the system is on the Standby Screen, the user presses a button on the number pad. The associated preset in the database is called and the radio changes stations.

2.1.2 User interfaces

Style - 1

The user interface is displayed on a 7 inch by 4 inch screen with a resolution of 1024 by 768. *units?*

The standby screen prominently displays the time in a large font in the center of the screen. It also displays the date in a smaller font and displays the current radio station in the top left hand corner. Pressing the number pad will switch the radio station to the preset linked to that number. Pressing the up and down arrows on the D-pad control the volume.

The main menu is where you access all the functionality of the alarm clock. The menu is navigated with the D-pad and selections are made with the enter key. The main menu allows you to access the alarm menu, the radio menu and the set date and time menu.

The alarm menu is accessed from the main menu and allows you to set, delete and modify the alarms. It is also navigated with the D-pad and selections are made using the enter key.

The set alarm function allows you to set an alarm. This is done with the number pad and allows the user to set both the time and the date the alarm will go off

The delete alarm function allows users to delete alarms that have already been set

The alarm screen will come up when the time specified in the alarm has been reached. This is accompanied by a tone to wake the user. To cancel the alarm the user pushes the cancel button on the remote. This brings up a confirm or cancel dialog. Pressing confirm brings the user to the main menu. Pressing cancel prevents the user from cancelling the alarm.

The radio can be tuned by selecting the radio button from the main menu. This brings up a menu with a large radio tuner in the center. *Figure 2* This is controlled with the left and right buttons on the D-pad. To make the current station a preset, simply hold down a number on the number pad and it will assign that station to that number.

The date and time can be set in the "Set Date and Time" menu. In the date and time menu, a new time is entered and the user is prompted to confirm the change. The user is then returned to the main menu.



Figure 1: Alarm Screen

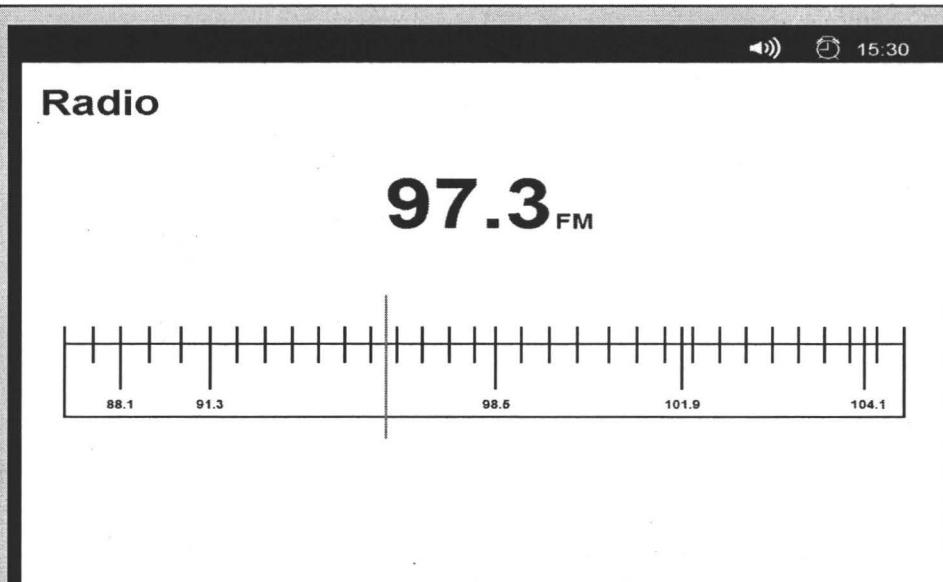


Figure 2: Radio Screen

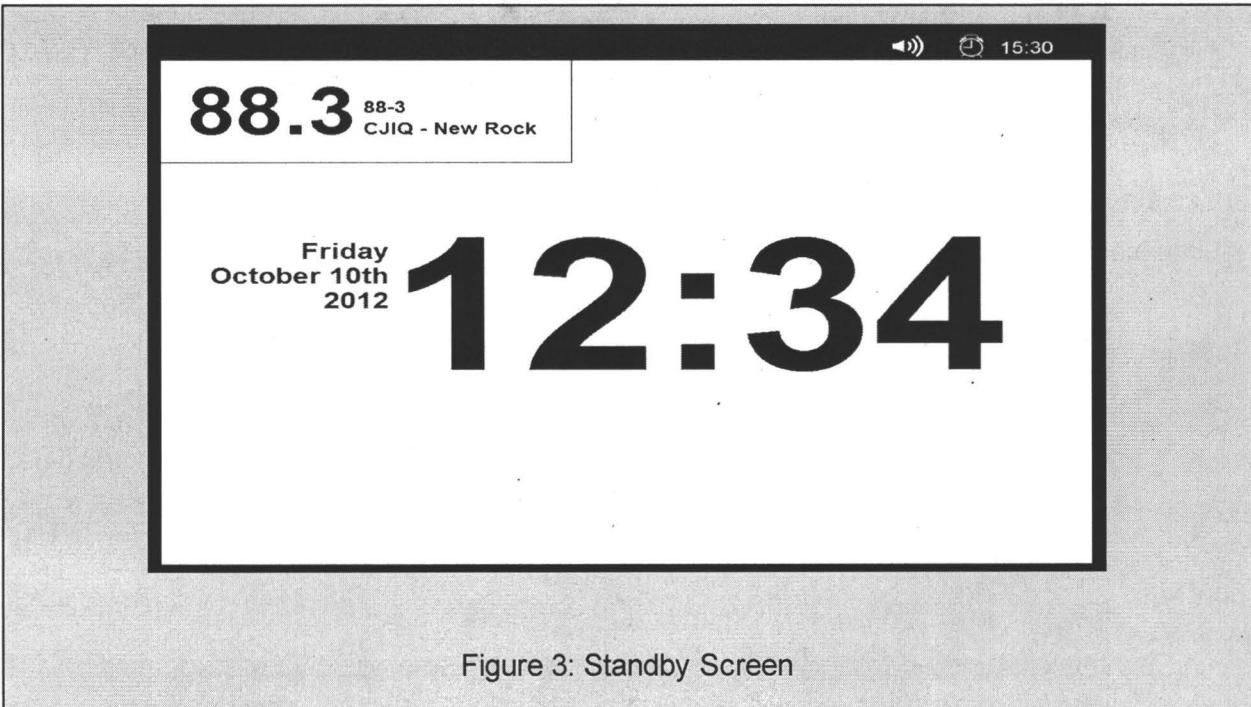


Figure 3: Standby Screen

2.1.3 Hardware interfaces

The system is controlled through an external hardware remote control. This remote contains the following buttons: a 0-9 number pad, a decimal point, a four way directional pad, a cancel and OK button.

It also will contain an external interface for communicating with third party hardware such as the bed occupancy sensor.

2.1.4 Software interfaces

The software must provide external coding interfaces so that the clock , the radio and the current volume state can be collected and displayed.

It also needs an API for the third party external interface.

*do you mean
bed occupancy?*

2.1.5 Communication interfaces

The system has a communication interface that allows the remote to connect and control the clock.

The system also has an external programmable interface a third party bed occupancy sensor.

2.1.6 Memory Constraints

The system is limited in hardware to having 2 gigabytes of primary memory and it uses flash memory for storage.

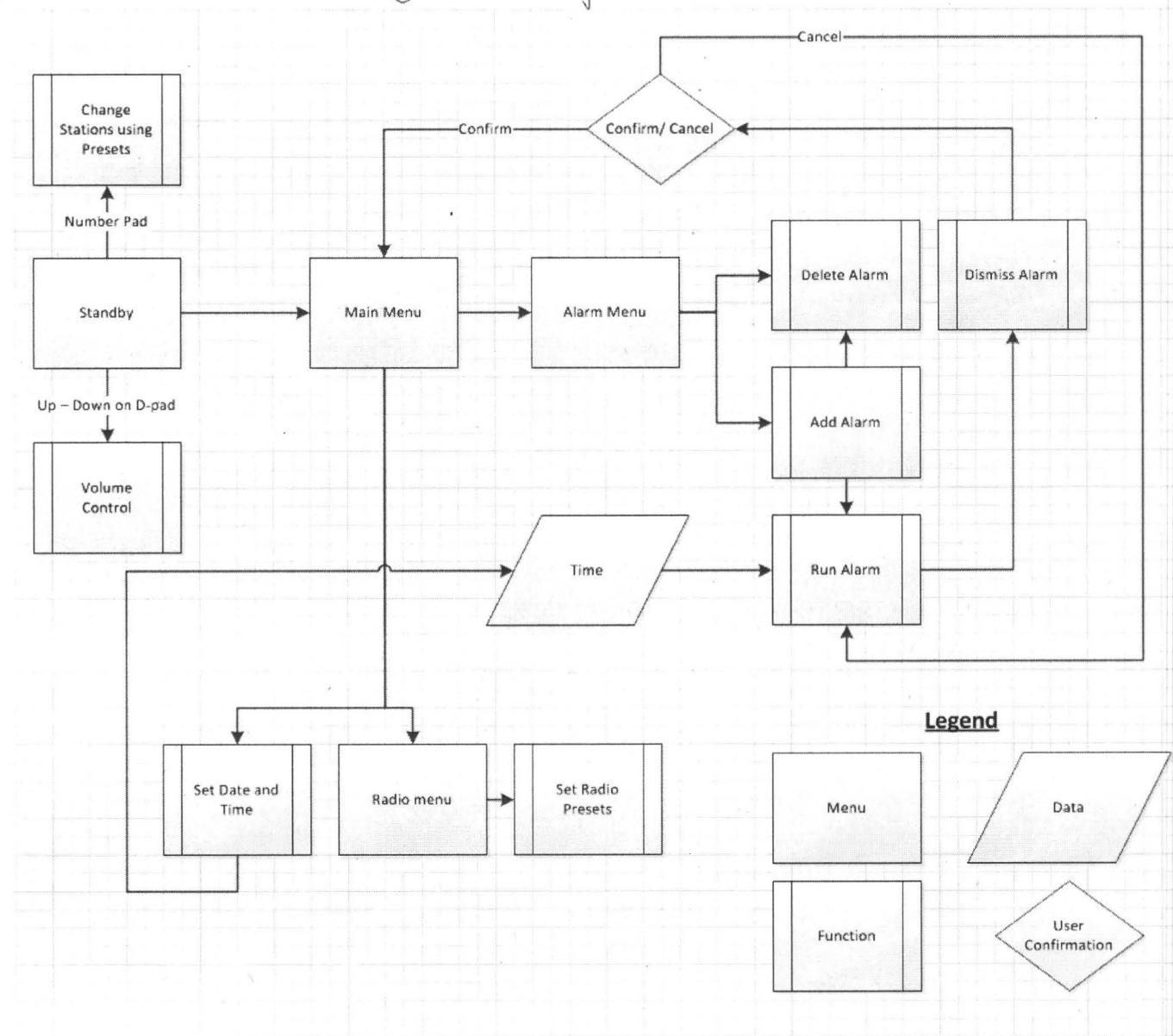
2.1.7 Site adaptation requirements

Since this software is only being installed on one type of hardware, no mission related features need to be adapted to run on other hardware.

- * 2.1.3) you've listed the remote & bed sensor in all these areas
 - which type of interface are they?
 - H/W interface - when your software talks directly to H/W & manipulates (like in assembly)
 - SW interface
 - when you have an API to program to Comm. Int.
 - when your software supports some low level protocol
- * clock has API for bed sensor & you could have assumed an API for remote.
 - so no H/W or comm. interfaces

2.2 Product functions

flowchart diagram is good to support a write up. Section 2.2 should be higher level description of 3.20



2.3 User characteristics

This product is designed for users of any age and education level. However, there are no accessibility options for people with audio or visual impairments.

Style -1

2.4 Constraints

The amount of radio presets is limited to 10 radio stations.

The system is running the Linux operating system.

The system is first and foremost an alarm clock, all other functions are secondary.

The controls must only contain the buttons listed in section 2.1.3 of this document.

2.5 Assumptions and dependencies

There were no assumptions made for this document.

really?

2.6 Apportioning of requirements

In future releases of this product, the USB port on the clock will allow 3rd parties to create extensions for this product. This will require APIs to allow the software on the clock to talk to the software in the accessories. A second feature in the future release is the inclusion of a touch screen interface. This will require a reworking of the user interface to make it more finger friendly.

3. Specific requirements

3.1 External interfaces

3.1.1 User interfaces

The clock shall display whatever a clock shall display on the 1024x768 display.

3.1.2 Hardware interfaces

Provided with the clock there will be a touch activated button remote control. The remotes' keys are as follows: 0-9 number pad with decimal point button, a four way directional pad for moving through menu items, adjusting volume, and scanning through radio, and a cancel and ok button. The remote will be an external piece of hardware which communicates to the clock.

Our system also links itself directly to an external interface from a commercially available third-party bed occupancy detector. This detector will be able to tell our system whether or not the user is in their bed. The communications protocol interface offered by the third-party system and what features it will provide has yet to be determined. This interface will be used when deciding if the alarm and/or radio should be turned on to wake up or notify the user that the clock has reached a specified time.

3.1.3 Software interfaces

The software must provide external coding interfaces so that the clock, the radio, and the current volume state can be collected and displayed on parts of the graphical user interface.

3.1.4 Communications interfaces

The device must provide some sort of external control communications interface so that the remote control may connect back with the clock.

• the level of description & detail you have in Sect 3.1 matches what you had in 2.1 - it shouldn't!

↳ Sect 3.1 should give much, much more detail and requirements

3.2 Functions

3.2.1 Standby Screen

3.2.1.1 Exit Standby

The system shall exit from its standby mode when a user presses any button on the remote.

- only the remote? what if they press a key on the keypad on the actual clock?

Use Case Name	Exit standby
XRef	

Format -2

The IEEE 830-1998 Spec
does not support use
case descriptions - I mentioned
several times in class
that these weren't allowed!

Trigger	The user presses any button other than what are being used for other functions.
Precondition	The clock is asleep and displaying the time.
Basic Path	The customer is presented with the main menu <i>- what's on the main menu?</i>
Alternative Paths	None <i>- you should have described this in Sect 3.1</i>
Postcondition	None
Exception Paths	None
Other	None

3.2.1.2 Run Alarm

The system shall trigger an alarm when a specified time has been met.

Use Case Name	Run alarm
XRef	
Trigger	A specified alarm time has been reached
Precondition	The clock must be given power and must be turned on
Basic Path	
Alternative Paths	The user can press any button other than ok to snooze the alarm
Postcondition	The alarm has now been deleted and will not trigger
Exception Paths	At the time when the confirmation dialog box comes up, the customer can press the cancel button to exit from deleting the alarm.
Other	None

3.2.1.3 Dismiss alarm

The system shall allow the user to dismiss currently triggering alarms.

Use Case Name	Dismiss alarm
XRef	
Trigger	The user presses the cancel button during a firing alarm
Precondition	The clock must have an alarm set and firing
Basic Path	A dismiss confirmation dialog will appear to ask the user if they would really like to dismiss the alarm. The user then uses the D-pad to select an ok button to dismiss the alarm
Alternative Paths	
Postcondition	The alarm is now dismissed and will no longer trigger unless the alarm has been set to repeat
Exception Paths	At the time when the confirmation dialog box comes up, the customer can press the cancel button to exit from dismissing the alarm
Other	None

3.2.1.4 Volume Up

The system shall allow the user to change the clock's volume by pressing the up button on the remote's d-pad.

Use Case Name	Volume Up
XRef	

Trigger	The user presses up on the clock remote's d-pad.
Precondition	The clock must be in standby mode.
Basic Path	After pressing the button, the clock will play an audible alert to confirm the change in volume with the user.
Alternative Paths	
Postcondition	The radio will now play at the newly set volume level.
Exception Paths	There is no exception path for this function.
Other	None

3.2.1.5 Volume Down

The system shall allow the user to change the clock's volume by pressing the down on the remote's d-pad.

Use Case Name	Volume Down
XRef	
Trigger	The user presses down on the clock remote's d-pad.
Precondition	The clock must be in standby mode.
Basic Path	After pressing the button, the clock will play an audible alert to confirm the change in volume with the user.
Alternative Paths	
Postcondition	The radio will now play at the newly set volume level.
Exception Paths	There is no exception path for this function.

Other	None
--------------	------

3.2.1.6 Radio Presets

The system shall allow the user to switch presets by pressing a number on the remote's number pad.

Use Case Name	Radio Presets
XRef	
Trigger	The user presses down a number on the remote's keypad.
Precondition	The clock must be in standby mode.
Basic Path	After pressing the button, the radio change to the station that the preset has been configured with.
Alternative Paths	
Postcondition	The radio start playing on the newly set station.
Exception Paths	There is no exception path for this function.
Other	None

3.2.2 Menu Screen

3.2.2.1 Alarm Settings

The system shall display the Alarm Settings screen when the user selects the Alarms button from the standby screen.

Use Case Name	Navigating to the Alarm Settings
----------------------	----------------------------------

↘ how do they do this?
 ↘ how do they navigate
 ↘ how do they option in the menu?
 ↘ to this kind of
 ↘ detail that needs
 ↘ to be in this
 ↘ section

XRef	
Trigger	The user selects the Alarm Settings button from the main menu.
Precondition	The clock must be in the main menu.
Basic Path	After pressing the button, the clock will open the Alarm Settings.
Alternative Paths	
Postcondition	The radio will display the Alarm Setting screen.
Exception Paths	There is no exception path for this function.
Other	None

3.2.2 Radio

The system shall open the Radio screen when the user selects the Radio button from the standby screen.

↗ is it a button or
 ↗ a menu option?
 ↗ would help
 ↗ if I had
 ↗ a diagram
 ↗ of the menu
 ↗ to help
 ↗ visualizing

Use Case Name	Navigating to the Radio
XRef	
Trigger	The user selects the Radio button from the main menu.
Precondition	The clock must be in the main menu.
Basic Path	After pressing the button, the clock will open the Radio screen.
Alternative Paths	
Postcondition	The radio will display the Alarm Setting screen.
Exception Paths	There is no exception path for this function.

Other	None
--------------	------

3.2.2.3 Set Time and Date

The system shall open the Set Time and Date screen when the user selects the Set Time and Date button from the standby screen.

Use Case Name	Navigating to the Set Time and Date screen
XRef	
Trigger	The user selects the Set Time and Date button from the main menu.
Precondition	The clock must be in the standby screen.
Basic Path	After pressing the button, the clock will open the Set Time and Date screen.
Alternative Paths	
Postcondition	The radio will display the Set Time and Date screen.
Exception Paths	There is no exception path for this function.
Other	None

3.2.2.4 Alarm Tone

The system shall allow the user to change alarm tones from a manufacturer defined set when the user selects the Alarm Tone button from the standby screen.

Use Case Name	Setting the alarm tone
----------------------	------------------------

Style - 1

XRef	
Trigger	The user selects the Alarm Tone button from the main menu.
Precondition	The clock must be in the main menu.
Basic Path	<ol style="list-style-type: none"> 1. The clock will display a list of predefined alarm tones for the user to choose from. Moving between tones will be handled with the d-pad. 2. The user can preview an alarm tone by navigating over top of the list item. 3. To confirm the selection of a new tone, navigate over top of the tone and press
Alternative Paths	
Postcondition	The radio will display the Alarm Setting screen.
Exception Paths	There is no exception path for this function.
Other	None

3.2.2.5 Sleep Mode

what is "sleep mode"? Is it standby mode

The system shall go back to standby mode when the user selects the sleep mode button from the standby screen.

Use Case Name	Getting back to Standby Mode
XRef	
Trigger	The user selects the Sleep Mode button from the main menu.
Precondition	The clock must be in the main menu.

Basic Path	After pressing the button, the clock will close the open menu and go back to the Standby screen.
Alternative Paths	
Postcondition	The radio will display the Standby Mode screen.
Exception Paths	There is no exception path for this function.
Other	None

3.2.3 Alarm Settings Screen

3.2.3.1 Add alarm

The system shall allow the user to add alarms to go off at user configurable times.

Use Case Name	Add alarm
XRef	
Trigger	The user presses the add alarm button from the alarm setup screen.
Precondition	The system displays the alarms management window which allows the customer to edit alarms.
Basic Path	<ol style="list-style-type: none"> the customer chooses what time they would like the alarm to be set off and what days they would like it to run. the customer then selects what mode they would like the alarm to run in. modes include silent, calm, and wake up. The customer chooses whether they would like an alarm tone or a specific radio station to come on. When the customer has finished filling the form, the system will add this alarm to its set of alarms in the database. The alarm will be called when the specified time and date is

what is the difference?

if want alarm

to be radio - how do they set station?

do they set station?

or select radio preset?

SRS 22 October 11th, 2012

This is the kind of detail that needs to be here.

	reached.
Alternative Paths	None
Postcondition	The alarm has now been added to the clock and will run at specified time and date.
Exception Paths	At any time, the customer can choose to cancel adding alarm by moving to the bottom and selecting the cancel button. When the cancel button is pressed, the current window will be immediately escaped and no new alarms will be added to the database.
Other	None

3.2.3.2 Delete Alarm

The system shall allow the user to delete their added alarms.

Use Case Name	Delete alarm
XRef	
Trigger	The user presses the delete alarm button from the alarm settings screen.
Precondition	The system displays the alarms management window which allows the customer to edit alarms.
Basic Path	<ol style="list-style-type: none"> 1. The customer is presented with a confirmation dialog box to confirm that they would like to delete the alarm 2. If the alarm's deletion is confirmed, the alarm is deleted and the customer is returned to the alarms management menu
Alternative Paths	None
Postcondition	The alarm has now been deleted and will not trigger

Exception Paths	At the time when the confirmation dialog box comes up, the customer can press the cancel button to exit from deleting the alarm.
Other	None

3.2.4 Set Time and Date Screen

3.2.4.1 Set time and date

The system shall provide the user the ability to change the clock date and time.

Use Case Name	Set time and date
XRef	
Trigger	The user selects the "Set time and date" menu selection in the menu
Precondition	The clock is currently displaying the menu screen
Basic Path	<ol style="list-style-type: none"> 1. The clock will change to display the "Set time and date" screen 2. The user enters a new date and time 3. The user confirms the change of time and date 4. The clock goes back to its main menu <p style="text-align: right;"><i>how? with what buttons?</i></p>
Alternative Paths	<ul style="list-style-type: none"> • The user enters only the current date; the time will be defaulted to its previous state • The user enters only the current time; the date will be defaulted to its previous state
Postcondition	Alarms will now be based off of the newly set time and date
Exception Paths	At the time when the "Set time and date" screen comes up, the customer can press the cancel button to exit from changing the date and time.

Other	None
-------	------

3.2.5 Radio Screen

3.2.5.1 Volume Up

The system shall allow the user to change the clock's volume by pressing the up on the remote's d-pad.

are these like
3.2.1.4 and
3.2.1.5??

Use Case Name	Volume Up
XRef	
Trigger	The user presses up on the clock remote's d-pad.
Precondition	The clock must be in standby mode. <i>← sleep mode?</i>
Basic Path	The system raises its volume.
Alternative Paths	
Postcondition	<ul style="list-style-type: none"> The radio will now play at the newly set volume level. After pressing the button, the clock will play an audible alert to confirm the change in volume with the user.
Exception Paths	There is no exception path for this function.
Other	None

3.2.5.2 Volume Down

The system shall allow the user to change the clock's volume by pressing the down on the remote's d-pad.

Use Case Name	Volume Down
---------------	-------------

XRef	
Trigger	The user presses down on the clock remote's d-pad.
Precondition	The clock must be in standby mode.
Basic Path	The system will lower it's volume.
Alternative Paths	
Postcondition	<ul style="list-style-type: none"> The radio will now play at the newly set volume level. After pressing the button, the clock will play an audible alert to confirm the change in volume with the user.
Exception Paths	There is no exception path for this function.
Other	None

3.2.5.3 Seek Left

The system shall allow the user to seek the radio left across the RF spectrum.

what does seek mean?

Use Case Name	Seek Left
XRef	
Trigger	The user presses left on the clock remote's d-pad.
Precondition	The clock must be in radio mode.
Basic Path	The system will seek the radio to the left.
Alternative Paths	
Postcondition	<ul style="list-style-type: none"> The radio will now play at the newly set station. After pressing the button, the clock will play an audible alert to confirm the change in station with the user.

Exception Paths	There is no exception path for this function.
Other	None

3.2.5.4 Seek Right

The system shall allow the user to seek the radio right across the RF spectrum.

Use Case Name	Seek Right
XRef	
Trigger	The user presses right on the clock remote's d-pad.
Precondition	The clock must be in radio mode.
Basic Path	The clock will seek the radio to the right.
Alternative Paths	
Postcondition	<ul style="list-style-type: none"> • The radio will now play at the newly set station. • After pressing the button, the clock will play an audible alert to confirm the change in station with the user.
Exception Paths	There is no exception path for this function.
Other	None

3.2.5.5 Seek to Radio Preset

The system shall allow the user to seek the radio to a preconfigured station preset.

Use Case Name	Seek to Radio Preset
XRef	

Trigger	The user presses one of the digits on the number pad of the clock remote.
Precondition	The clock must be in radio mode.
Basic Path	The radio will seek to the station preset.
Alternative Paths	
Postcondition	The radio will now play at the newly set station.
Exception Paths	There is no exception path for this function.
Other	None

3.2.5.6 Configure a Radio Preset

The system shall allow the user to set radio presets.

Use Case Name	Configure a radio preset
XRef	
Trigger	The user holds down of the digits on the number pad of the clock remote.
Precondition	The clock must be in radio mode.
Basic Path	The radio sets the currently playing radio station as the preset to the corresponding button that was pressed.
Alternative Paths	
Postcondition	After pressing the button, the clock will play an audible alert to confirm the change in station with the user.
Exception Paths	There is no exception path for this function.

Other	None
-------	------

3.3 Performance requirements

The clock shall keep track of the time and date and display it when called. The clock keeps track of ten radio pre-set stations and each radio pre-set corresponds with a number from 0-9. The clock keeps track of the alarm settings such as ring tone used, snooze length, volume level, and date/time.

These aren't really performance requirements - these are functional requirements

3.4 Logical database requirements

Data	Use
Time / Date	The Time and Data will be called and display by the clock on the standby screen and at the top of the screen when not on the standby screen. <i>not a DBase requirement</i>
Radio Presets	The Clock will need to store 10 radio presets that will be used when the user press's 0-9 on the radio screen
Volume	The volume level must be stored and will be displayed on the screen in the radio menu and be displayed at the top of the screen on any other menu. The volume will be modified when the user presses the up or down keys.
Alarm	The Alarm times needs to be stored by the clock. The Alarm will be called used when the alarm is active and reaches the set time. The <i>what other info besides alarm tone stored in alarm?</i>

	Alarm time can be modified in the alarm settings. The Ringtone for the alarm must also be stored and can also be modified in the Alarm settings.
--	--

3.5 Design constraints

The Clock will only have the buttons: 0 - 9, Ok, Cancel, Decimal , and, Left Right Up Down arrows. The Clock screen is a 1024x768 pixel 4 inches by 7 inches Screen. The Clock has 2GB of memory. → what about 0/5?

3.6 Software system attributes

3.6.1 Reliability

There were no explicitly stated reliability requirements.

3.6.2 Availability

Our software will be available only to those who buy the Clock.

3.6.3 Security

Our system will not feature any security.

3.6.4 Maintainability

Our software will be maintained and updated when needed.

3.7 Organizing the specific requirements

Format - I

3.7.1 System mode

The Clock will feature a setup mode and a standard mode. The only time that the Clock is in setup mode is when it is first used. In setup mode the Clock will ask the user to input the time, date, alarm settings and radio settings. The Clock will then go into standard mode unless the clock is reset. In standard mode the user can use any of the clocks features.

3.7.2 User class

The Clock will only have one user profile. The clock will not respond differently for different users.

3.7.3 Objects

The Clock will have a screen 4 inches by 7 with a resolution of 1024x768 pixels. It will have a bed sensor developed by a third party. It will also have a remote with; Up, Down, Left, Right arrows, Numbers 0-9 with 1-7 also labeled with the days of the week, a decimal point, Ok and Cancel buttons.

3.7.4 Feature

3.7.4.1 Time

The Clock will have a Time feature that keeps track of the time. The time will be displayed on the Standby screen at all times. When in other menus the time will be displayed at the top of the screen and the value is initially set in setup mode. The time can be changed by using the option menu and selecting "Change Time/Date".

3.7.4.2 Date

The Clock will have a date feature that will keep track of the day, month and year. The date will

be displayed on the Standby screen on the left side of the time. The data will be initially set in setup mode. The date can then be changed by going into the options and selecting change date.

3.7.4.3 Alarm

The Clock will have a alarm feature. The Alarm feature can be turned on by going into settings and choosing alarm settings. In the Alarm settings you can specify the day of the year and the time you want the alarm to go off. When the alarm goes off the Clock screen changes the to the alarm screen as seen in Figure 1 section 2.1.2. The user will then have the option to either select snooze or turn off the alarm. If the snooze option is selected it will then go back to the Standby screen until the alarm goes off again. The snooze length is set in the advanced alarm options in the settings menu. If the user chooses cancel the alarm will be turned off and the clock will return to the standby screen.

3.7.4.4 Radio

The Clock will have a radio function. To go into the radio menu the user must go into setting and then select radio. Once in the radio menu the user can Turn on the radio by pressing ok. The user can scan the channels using the left and right arrows and change the volume by using the up and down arrows. The user can also use the numbers 0 - 9 to select their radio preset and can set a new preset by holding numbers 0 - 9. You can enter a station by pressing ok then entering the station using the 0-9 and decimal key. The user can then exit the radio mode by pressing cancel. The radio will continue to play outside of radio mode but the only available functions will be volume and changing station using presets. The current station will be displayed at the top of the screen at all times.

3.7.4.5 Setup

When first used the Clock radio will be in setup mode. Setup mode will take the user through setting up the basic functions of the clock radio. the time and date will be initially set and it will take the user on a brief tour of the system explaining how many of the functions of the clock radio work.

3.7.4.6 Standard mode

The Standard mode is the mode the is always in after it has completed setup mode. In standard mode the user can go through the settings menu and use all functions of the clock.

3.7.5 Response

The Clock will respond to the user input from the buttons on the remote and to the 3rd party bed sensor. On the standby screen the up and down arrows will adjust the volume, the numbers 0-9 will change the radio station to the preset radio station of the selected number. The ok button will take you to the settings menu.

In the radio menu the up and down arrows will adjust the volume, the left and right arrows will scan the radio, the 0-9 will be the radio presets, Ok will allow you to enter a station and cancel will take you back to settings.

In the rest of the menus, Up, down, left and right will be directional, ok will select the option, and cancel will take you back to the previous menu.

3.7.6 Functional hierarchy

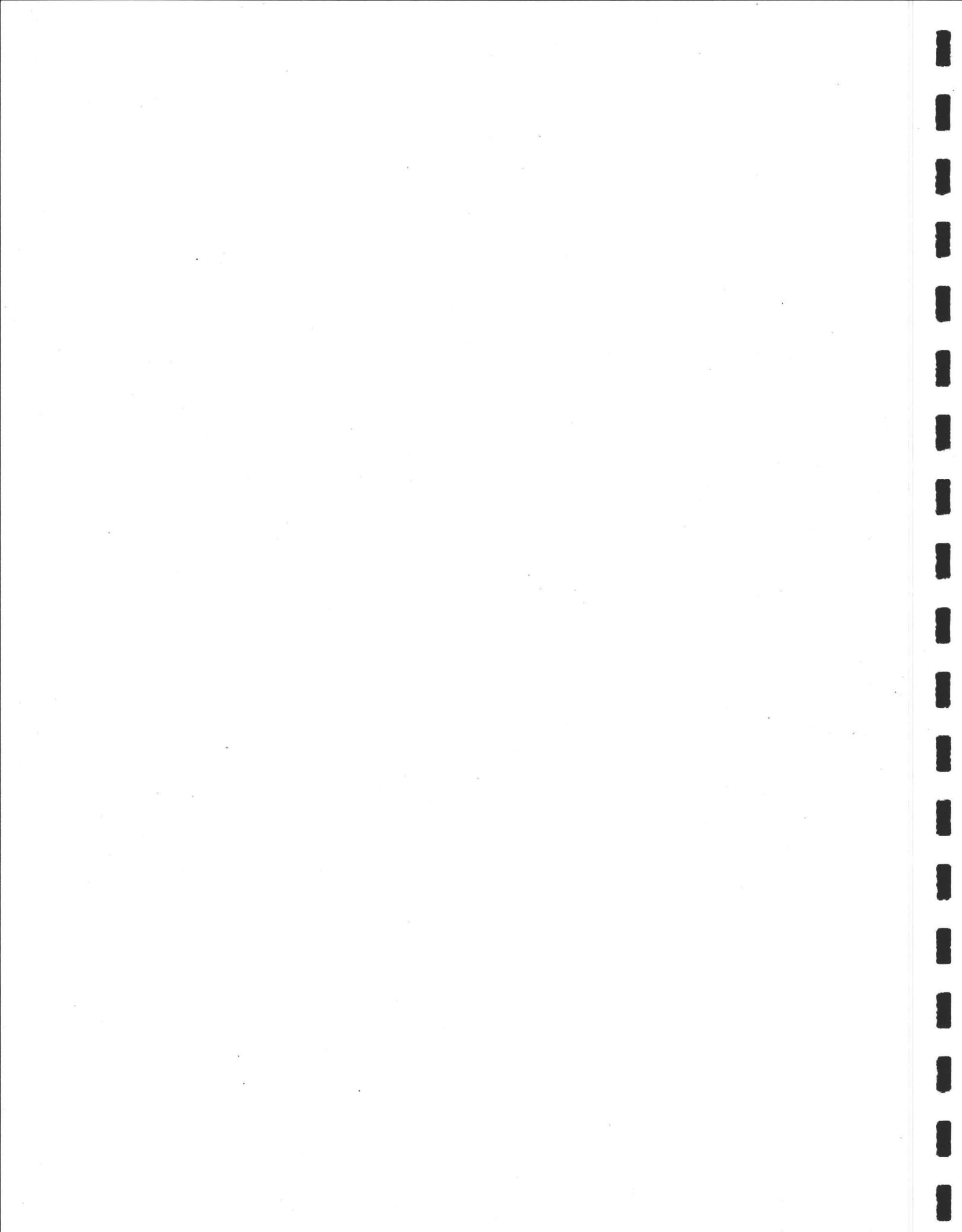
The first screen in the starting menu is the standby screen which, displays the time and date. It also has the volume, radio station and alarm indicator on the top of the screen as shown in Figure 3 in section 2.1.2. The next screen is the settings menu. The settings menu has all the different sub menus' such as alarm settings, radio settings and Date/Time. The next screen is the radio screen. The radio screen has the radio station that it is currently set to in the center. It also has the time volume and alarm indicator on the top of the screen see Figure 2 section 2.1.2. Another screen is the alarm screen. The alarm screen display a box the asks you if you want to dismiss the alarm. see Figure 1 section 2.1.2

3.8 Additional comments

This section is not required for this document but is provided so that it follows the IEEE standard. Please disregard this section.

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Revision History

Date	Version	Description	Author
<01/01/2001>	<1.0>	First version	Martin Robillard

Time Monitoring Tool Software Requirements Specifications

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Software Requirements Specifications

1. Introduction

1.1 Purpose

The purpose of this document is to describe the requirement specifications for a time monitoring tool for software development teams.

The intended audience of this document includes the prospective developers of the tool and the technical assessment personnel of the client organization.

1.2 Scope

The software system to be produced is a Time Monitoring Tool, which will be referred to as "TMT" throughout this document.

The Time Monitoring Tool will allow developers working within a defined software development process to record the time spent on the various software development activities, such as designing, coding, testing, or debugging. The TMT will also allow a manager to derive analyses and produce reports based on the data entered in the system.

The TMT could be used in any software development application to record the resources spent on the various software development activities. The objective of the TMT is to record the various activities being done. The goals are manifold depending on the users of the data. The developers use TMT to record the activities that are being performed. The managers use data recorded from TMT to validate its planning, budgets and schedules. The software process manager uses data from TMT to better understand the various software processes prescribed practices and to guide software process improvement concerns.

1.3 Definitions, acronyms, and abbreviations

Activity: nature of what is being done. The software process manager defines activities. Examples of activities are: analyzing, coding, designing, testing, etc.

Artifact: physical entity that results from an activity. Required artifacts are defined by the software engineering process. Examples of artifacts are SRS, architecture diagram, UML diagrams, source code, test scripts, user manuals.

DCM: Developer Client Module

JSP: Java Server Pages,

MCM: Manager Client Module

MCW: Manager Client Window

SM: Server Module

SRS: Software Requirement Specification

Task: unit of work defined by the manager and for which the developer is accountable. task is a component of the schedule with a start and end date.

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Timestamp: A qualified unit of time spent on a software development-related activity. The unit is qualified in terms of the following pieces of information: week, duration, project, task, activity, and sub-activity.

TMT: Time Monitoring Tool, which is the name of the tool to be developed

TMW: Time Monitoring Window

1.4 References

IEEE Std. 830-1993: IEEE Recommended Practice for Software Requirements

Specification: <http://www.esperanto.org.nu/isp/ispfaq.jsp#q1>

1.5 Overview

The rest of this document contains an overall description of the Time Monitoring Tool software system (section 2), and the specific requirements for the system (section 3).

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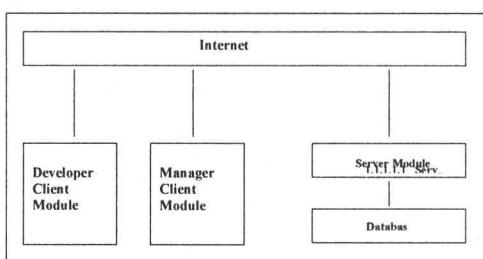
2. Overall description

2.1 Product perspective

In some software development organizations, developers are required to record the time spent on the various activities that are related to the development of software. This information is commonly used for various administration tasks, such as budget planning. Without tool support, precisely recording the time spent on each activity can be a tedious task. A time monitoring tool can ease this task.

2.1.1 System Interfaces

The TMT system to be developed is a stand-alone tool that is integrated within the organization's intranet. It consists in four major components: a Developer Client Module, a Server Module, a Database, and a Manager Client Module (see diagram 1).



The DCM allows developers to log onto the TMT system and to record timestamps corresponding to their activities in a convenient way. The server module is a daemon that accepts connections from Developer and Manager Client Modules and serves as an interface between these modules and a database. The Manager Client Module allows a manager to retrieve timestamp information from the database to produce analyses and reports. The Database component can be any type of database. It does not have to be developed as a part of the TMT system, as long as the Server Module can interface with an available database system.

All components must execute on WindowsNT.

2.1.2 User interfaces

The Developer and Manager Client Modules must provide a user interface that is available through the Netscape WWW browser. The Server Module does not have a user interface other than a command to launch it. The Database module does not have a user interface.

2.1.3 Hardware interfaces

All components must be able to execute on a personal computer.

2.1.4 Software Interfaces

The Developer and Manager Client Modules must be Java Applets running within Netscape. The Server Module must integrate with a DBMS through the Java Database Connectivity (JDBC) Interface. The Server must run within a Web Server available for WindowsNT, using dynamic content technology (e.g., Java Server Pages (JSP), CGI/Perl, and Cold Fusion).

2.1.5 Communication interfaces

The Developer and Manager Client Modules must communicate with the server over a TCP/IP connection. The Server and the Database components should be located on the same host.

2.1.6 Memory Constraints

The Developer and Manager Clients must be able to operate within 64MB (including memory for Netscape), and the server and database within 128MB.

2.1.7 Operations

The operation of the Developer and Manager client Modules must be easy and intuitive for professional software developers and managers. No specific formation must be required to use the tool. The Server module must be installed and maintained with no interaction with existing software and should not require any specific technical skill from a network administrator.

Backup operations must be defined.

Recovery operations must be specified in case of network failure, user machine failure and database failure.

2.1.8 Site adaptation requirements

No specific site adaptation should be required.

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2.2 Product functions

The two main functions of the Time Monitor software system are to allow developers to use a www browser to store timestamp records in a database, and to allow a manager to analyze these timestamp records.

A timestamp record consists of the time duration of a specific activity with its unique identification. The unique identification is made of three components: the project, the user and the date when the activity is taken place. The description of an activity is divided into three components: a task name, an activity, and an artifact.

For managerial purposes it is often useful to define the date in terms of the current week. The current week is defined as the week starting on the Monday immediately preceding the current day of the week, and ending on the Sunday immediately following the current day of the week, inclusively.

A task is a unit of work defined by the manager and for which the developer is accountable. A task is a component of the schedule with a start and end date. Examples of tasks are: Implement module A, Design library XYZ. Developers usually work on assigned tasks. One developer may work on many tasks and a given task may involve many developers.

An activity is the nature of what is being done. Software developers are mostly involved in cognitive activities. The various cognitive activities composed the practices that are defined from the software engineering processes. The software process manager defines the activities and the developer must select the activities that are most representative of what is being done during the recorded time. Typical examples of activities are analyzing, coding, designing, testing etc... An artifact is a physical entity that results from an activity. The software engineering process defines required artifacts. Typical artifacts are SRS, architecture diagram, UML diagrams, source code, test scripts, user manuals, etc... Developers must select artifacts among predefined lists.

Names of Tasks, Activities and Artifacts are predefined for a project and are stored in the database of the TMT system.

The database stores two different types of items: user configurations and time stamp records. User configurations consist in a username, a password, and a list of projects, tasks, activities and artifacts currently available for this user.

Time stamp records stored in the database consist of a time stamp as described above, plus a field identifying the week, and a field identifying the username.

2.3 User characteristics

Users are software developers familiar with the web technology. Users are knowledgeable of the software engineering process and have good understanding of the tasks, activities and artifacts they are being involved with.

2.4 Constraints

The system should enforce user authentication security and guarantee timestamps reliability.

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2.5 Assumptions and dependencies

No specific assumption or dependencies.

3 Specific functional requirements

3.1 Developer Client Module (DCM)

3.1.1 *The user shall be able to load the DCM within Netscape*

3.1.2 *The DCM shall support the logging of users.*

3.1.2.1 The initial window of the DCM shall contain a field for a user name, a field for a password, and a button labeled login. The password field shall be a "secret" field, which does not display what the user types.

3.1.2.2 When a user presses the login button, the DCM shall send a request to the SM to login the user.

3.1.3 *If the logging of a user is successful (see 3.1.2.2), the DCM shall display the TMW.*

3.1.3.1 The TMW shall always display the identifier for the current week.

3.1.3.2 The TMW shall always display the username of the user currently logged in.

3.1.3.3 The TMW shall display all the validated and non-validated time stamp records previously entered for the current week by the user currently logged in.

3.1.3.3.1 The validated and non-validated time stamp records shall be displayed in a tabular fashion, with every record being on a separate row.

3.1.3.3.2 The fields should be identified with labels. Intuitive and non-confusing abbreviations can be used if necessary.

3.1.3.3.3 The fields should be non-modifiable to prevent modification of the time stamp records.

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3.1.3.4 The TMW shall display all the refused time stamp records previously entered by the user currently logged in.

3.1.3.4.1 The refused time stamp records shall be displayed in a tabular fashion, with every record being on a separate row.

3.1.3.4.2 The fields should be identified with labels. Intuitive and non-confusing abbreviations can be used if necessary.

3.1.3.4.3 The fields should be modifiable to allow correction of the time stamp records.

3.1.4 The existing TMW timestamps shall be updateable

3.1.4.1 It shall only be possible to modify the Project, Task, Activity, and Artifacts fields with values that are allowed for the user currently logged in.

3.1.4.2 It shall only be possible to modify the time fields for every day of the week using a positive numerical value of maximum 24.

3.1.4.3 Modifications to the records shall not be synchronized automatically with the server, that is, it should be possible to modify several values and then to click a bottom or perform another mechanism to update the server.

3.1.5 The TMW shall support the entry of new timestamps

3.1.5.1 It shall be possible to add new timestamps according to predefined fields

3.1.5.2 All new timestamps should come with the predefined selections for a given user.

3.1.5.3 It shall be possible to create up to 100 new timestamps for a given user and a given current week.

3.1.5.4 All time entry shall be in hours and minutes H:mm

3.1.6 The TMW shall support entry of timestamps

3.1.6.1 All fields of a timestamp shall have predefined values for the logged in user.

3.1.6.2 Project, Task, Activity, Artifact and at least one time field must be filled out before the record is sent to the database.

3.1.6.3 Time entry could be in duration or taxi mode.

3.1.6.4 G clock for the taxi mode.

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3.1.7 *The TMW shall provide cumulative totals*

3.1.7.1 Each column day of the current week shall have the total number of hours

3.1.7.2 Each project and task line of the current week shall have the total number of ours recorded.

3.1.7.3 The total number of hours recorded in the current week shall be displayed

3.1.7.4 All time records shall be displayed in hours and minutes: H:mm.

3.2 Manager Client Module (MCM)

3.2.1 *The manager shall be able to load the Manager Client Module within Netscape*

3.2.2 *The Manager Client Module shall support the logging of managers.*

3.2.2.1 The initial window of the MCM shall contain a field for a user name, a field for a password, and a button labeled login. The password field shall be a "secret" field, which does not display what the user types.

3.2.2.2 When a user presses the login button, the MCM shall send a request to the SM to login the user.

3.2.3 *If the logging of a user is successful (see 3.2.2.2), the MCM shall display the MCW.*

3.2.3.1 The MCW shall always display the username of the manager currently logged in.

3.2.3.2 The MCW shall display two groups of icons, which are for the user management and the project management.

3.2.4 MCW shall support user's management

3.2.4.1 The user management icons shall include: add a user, display/modify/disable users, and validate timestamps.

3.2.4.2 Clicking add user icons shall display a fill in form for adding a user to the project

3.2.4.2.1 Add user form shall enable the recording of the user id, the projects, the user's supervisor identification, and the selection of predefined fields for this user.

3.2.4.2.2 Add user form shall be validated for completeness before being sent to the Server Module.

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3.2.4.3 Clicking Display all users icon should display the list of all users in alphabetical order with the identification of the projects that they are involved in and their supervisor.

3.2.4.3.1 This option could provide a list ordered alphabetically by last name of the user or by project or by supervisor.

3.2.4.3.2 By selecting a user, his profil can be changed or disabled.

3.2.4.4 Clicking validate timestamps should display the list of all timestamps records submit by users.

3.2.4.4.1 The timestamp records shall be displayed in a tabular fashion, every record being on a separate row.

3.2.4.4.2 The fields should be identified with labels. Intuitive and non-confusing abbreviations can be used if necessary.

3.2.4.4.3 The manager can validate a timestamp record, refuse a record or leave timestamp record non-validated.

3.2.4.4.4 The validated timestamps records should be inserted in the database.

3.2.4.4.5 The refused timestamps records should be returned to the user to allow correction.

3.2.4.4.6 The non-validated timestamp record should be stayed in the table to allow manager to validate or refuse a timestamp record another time.

3.2.5 MCW shall support project's management

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3.2.5.1 The project's management icon shall include the add project, add task, MS EXCEL and MSPProject icons.

3.2.5.2 Clicking add project icon shall display a form to identify the new project to add.

3.2.5.3 Clicking the add task icon shall display a form to add a new task in a project selected.

3.2.5.4 Clicking the EXCEL icon shall display a form to identify the project, users, week's data and the EXCEL file where the corresponding data from the database should be transferred.

3.2.5.5 Clicking the MSPProject icon shall display a form to identify the project, users, week's data and the MSPProject file where the corresponding data from the database should be transferred.

3.3 Server Module (SM)

3.3.1 The SM shall be the only intermediate between the two client modules and the database.

3.3.2 The SM shall receive all the requests and format the pages.

3.3.3 The SM shall accept all connections from developers and manager client modules.

3.3.4 Upon log in request from the DCM the SM shall produce the TMW as specified in 3.1.2

3.3.5 Upon request for updating time stamp records from the DCM the SM shall update the database to reflect the new state of the DCM.

3.3.6 The SM shall validate and execute all requests coming from the DCM.

3.3.7 Upon log in request from the MCM the SM shall produce the MCW as specified in 3.2.2.

3.3.8 The SM shall validate and execute all requests coming from the MCM.

3.3.9 The SM shall display the TMT status

3.3.9.1 Any error of execution, communication, validation or else shall be identified and appropriate comment display.

3.3.9.2 The SM shall try to recovery from most common errors.

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4. Classification of functional requirements

Functionality	Type
3.1.1 The user shall be able to load the DCMwithin Netscape	Essential
3.1.2 The DCMshall support the logging of users.	Essential
3.1.2.1 The initial window of the DCM shall contain a field for a user name, a field for a password, and a button labeled login. The password field shall be a "secret" field, which does not display what the user types.	Essential
3.1.2.2 When a user presses the login button, the DCM shall send a request to the SM to login the user.	Essential
3.1.3 If the logging of a user is successful (see 3.1.2.2), the DCM shall display the TMW.	Essential
3.1.3.1 The TMW shall always display the identifier for the current week.	Desirable
3.1.3.2 The TMW shall always display the username of the user currently logged in.	Desirable
3.1.3.3 The TMW shall display all the time stamp records previously entered for the current week by the user currently logged in.	Essential
3.1.3.3.1 The time stamp records shall be displayed in a tabular fashion, with every record being on a separate row.	Desirable
3.1.3.3.2 The fields should be identified with labels. Intuitive and non-confusing abbreviations can be used if necessary.	Desirable
3.1.4 The existing TMW timestamps shall be updateable.	Essential
3.1.4.1 It shall only be possible to modify the Project, Task, Activity, and Artifacts fields with values that are allowed for the user currently logged in.	Essential
3.1.4.2 It shall only be possible to modify the time fields for every day of the week using a positive numerical value of maximum 24.	Essential
3.1.4.3 Modifications to the records shall not be synchronized automatically with the server, that is, it should be possible to modify several values and then to click a bottom or perform another mechanism to update the server.	Essential
3.1.5 The TMW shall support the entry of new timestamps.	Essential
3.1.5.1 It shall be possible to add new timestamps according to predefined fields.	Desirable

3.1.5.2 It shall be possible to create up to 100 new timestamps for a given user and a given current week.	Essential
3.1.5.3 All new timestamps should come with the predefined selections for a given user.	Desirable
3.1.5.4 All time entry shall be in hours and minutes H:mm.	Essential
3.1.5.5 All empty time fields shall be at 0	Desirable
3.1.6 The TMW shall support entry of timestamps	Essential
3.1.6.1 All fields of a timestamp shall have predefined values for the logged in user.	Desirable
3.1.6.2 Project, Task, Activity, Artifact and at least one time field must be filled out before the record is sent to the database.	Essential
3.1.6.3 Time entry could be in duration or taxi mode.	Desirable
3.1.6.4 TMW shall provide a running clock for the taxi mode.	Desirable
3.1.7 The TMW shall provide cumulative totals.	Essential
3.1.7.1 Each column day of the current week shall have the total number of hours recorded.	Essential
3.1.7.2 Each project and task line of the current week shall have the total number of hours recorded.	Essential
3.1.7.3 The total number of hours recorded in the current week shall be displayed.	Essential
3.1.7.4 All time records shall be displayed in hours and minutes: H:mm.	Essential
3.2.1 The manager shall be able to load the Manager Client Module within Netscape.	Essential
3.2.2 The Manager Client Module shall support the logging of managers.	Essential
3.2.2.1 The initial window of the MCM shall contain a field for a user name, a field for a password, and a button labeled login. The password field shall be a "secret" field, which does not display what the user types.	Essential
3.2.2.2 When a user presses the login button, the MCM shall send a request to the SM to login the user.	Essential
3.2.3 If the logging of a user is successful (see 2.2.2), the MCM shall display the MCW.	Essential
3.2.3.1 The MCW shall always display the username of the manager currently logged in.	Desirable
3.2.3.2 The MCW shall display two groups of icons, which are for the user management and the project management.	Desirable

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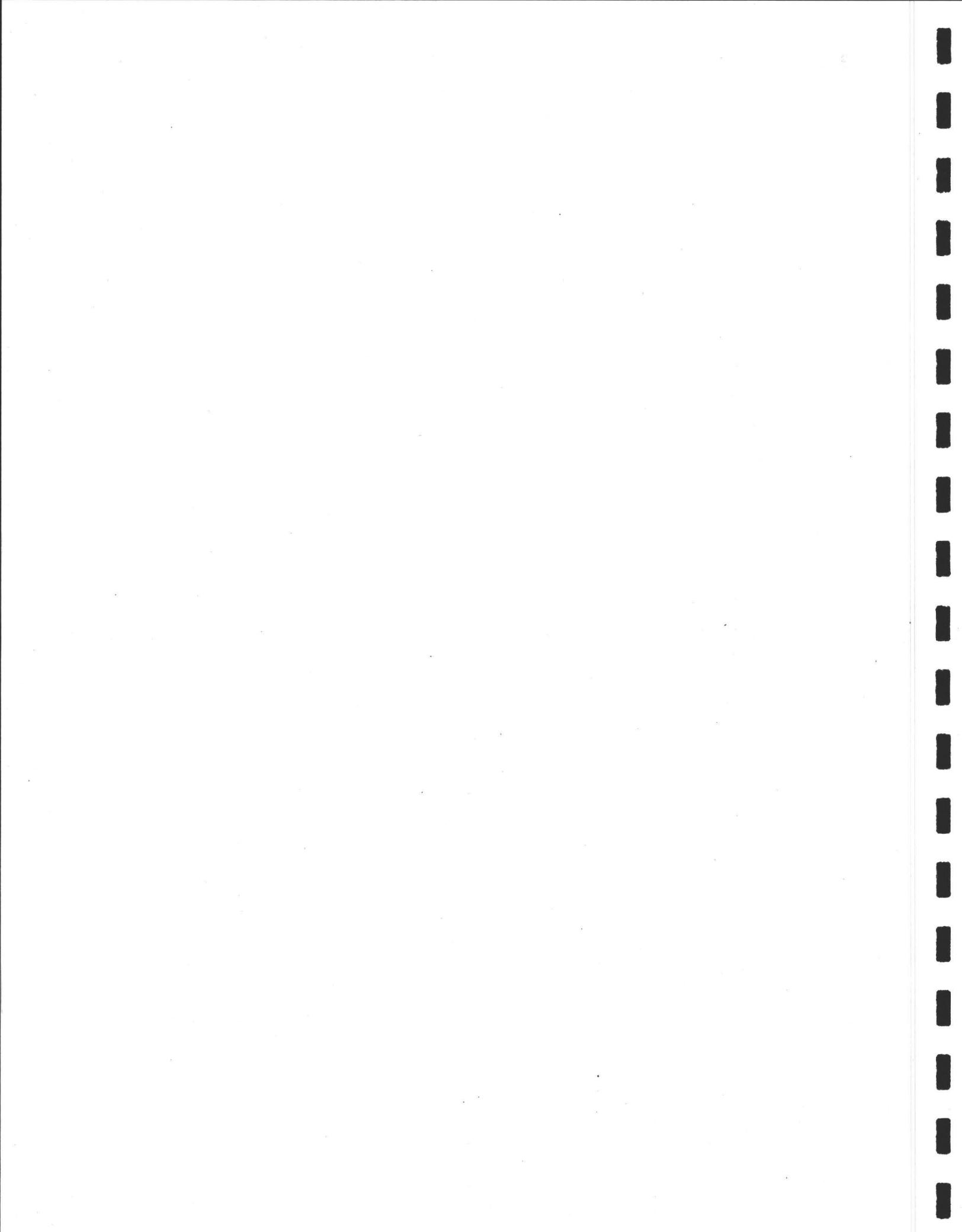
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3.2.4 MCW shall support user's management.	Essential
3.2.4.1 The user management icons shall included: add a user, delete a user, display all users, and modify user's file.	Essential
3.2.4.2 Clicking add user icons shall display a fill in form for adding a user to the projects.	Essential
3.2.4.2.1 Add user form shall enable the recording of the user id, the projects, the user's supervisor identification, and the selection of predefined fields for this user.	Essential
3.2.4.2.2 Add user form shall be validated for completeness before being sent to the SM.	Essential
3.2.4.3 Clicking delete user icons shall display the list of all users in alphabetical order with a check box for delete user and the date of the day that could be overwritten.	Essential
3.2.4.4 Clicking Display all users icon should display the list of all users in alphabetical order with the identification of the projects that they are involved in and their supervisor.	Essential
3.2.4.4.1 Display all users could provide a list ordered alphabetically by last name of the user or by project or by supervisor.	Desirable
3.2.4.5 Clicking Modify user's file icon shall display the list of users in alphabetical order with a check box for modify user's file.	Essential
3.2.4.5.1 Clicking the modify user file shall display the complete user file an enable overwriting of any field.	Essential
3.2.5 MCW shall support project's management	Optional
3.2.5.1 The project's management icon shall include the EXCELL and MSProject icons.	Optional
3.2.5.2 Clicking the EXCELL icons shall display a form to identify the project; users, week's data and the EXCELL file where the corresponding data from the database should be transferred.	Optional
3.2.5.3 Clicking the MSProject icons shall display a form to identify the project; users, week's data and the MSProject file where the corresponding data from the database should be transferred.	Optional
3.2.5.4 All forms shall be sent to SM for validation.	Essential
3.2.5.4.1 Unvalidated fields shall be clearly indicated with appropriate comments.	Desirable
3.3.1 The SM shall be the only intermediate between the two client modules and the database.	Essential

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3.3.2 The SM shall receive all the requests and format the pages.	Essential
3.3.3 The SM shall accept all connections from developers and manager client modules.	Essential
3.3.4 Upon log in request from the DCM the SM shall produce the TMW as specified in 3.1.2.	Essential
3.3.5 Upon request for updating time stamp records from the DCM the SM shall update the database to reflect the new state of the DCM.	Essential
3.3.6 The SM shall validate and execute all requests coming from the DCM.	Essential
3.3.7 Upon log in request from the MCM the SM shall produce the MCW as specified in 3.2.2	Essential
3.3.8 The SM shall validate and execute all requests coming from the MCM.	Essential
3.3.9 The SM shall display the TMT status.	Essential
3.3.9.1 Any error of execution, communication, validation or else shall be identified and appropriate comment display.	Desirable
3.3.9.2 The SM shall try to recovery from most common errors.	Desirable



SRS – Fred Interview

Previously submitted questions

1. Q: Would you be ok with a phone syncing to it rather than a remote. (using the phone as the remote)
A: Yes- but don't remove the ability to set alarms just on the clock itself

2. Q: Would you like the clock to be able to sync with Google calendars or similar programs through your smart phone.
A: Perhaps in a future release

3. Q: Who you like to use a Bluetooth connection for the control?
A: Normal control panel on the clock is wanted

4. Q: What additional information would you like displayed?
A: Any relevant information that does not cost any more time or money in production

5. Q: Would you like an option to display a calendar.
A: Good idea. Don't forget to display the days of the week

6. Q: Has the hardware already been designed , what hardware do we have to work with
A:2GB of RAM – Flash Memory – Linux base system – Bed sensor is manufactured by a third party company with an external programming interface

7. Q: Would you like a function for allowing the clock to say the time?
A: Display on screen, yes – Speak time, no

8. Q: Would you like a function to allow adjusting the text size?
A: User friendliness is appreciated. The clock will be able to display 16-bit colors on a 1024x768 display

9. Q: What kind of volume control would you like?
A: Silent to loud – Normal volume operation

10. Q: Would you like a touch screen controller ?
A: Perhaps in a future release

During the interview questions

- Basic alarm setup
 - The clock will display time
 - Alarms up to any number the user decides
 - User customizable radio presets
- Advanced alarm setup
 - Change theming
 - Color
 - Font size
- Basic function will be assumed, advanced function will be in the initial setup
- Radio presets up to ten
- Alarm tones will be preloaded