Development of an android application

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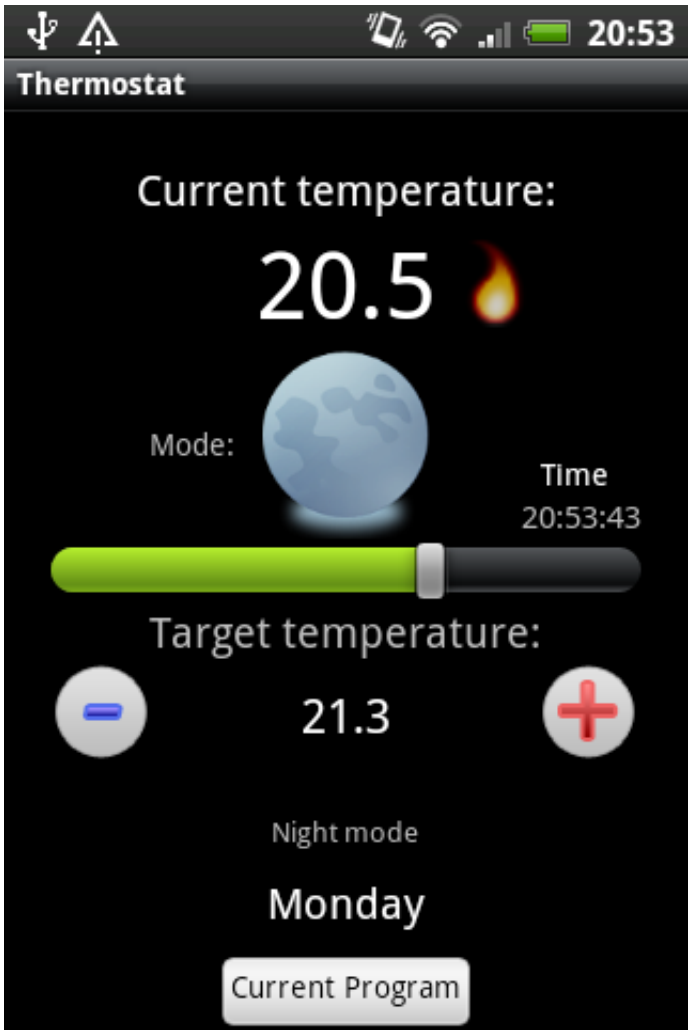

Contents

1 Introduction √

The assignment consists of designing an application for an android device with which the user can remotely control his thermostat. In this application the user should be able to save a week programm that is easy to specify, review and update. It should contain a day and a night temperature between which the user can switch at set times. There has to be a limit of 5 switches from day to night and 5 the other way around and there is an automatic reset to night temperature at midnight. Beside the week programm the user has to be able to monitor the system status and override the current temperature. This has to be easy for the user and he can choose all temperatures between 5 and 40 degrees with a tenth degree precision. There also has to be an option to override the schedule until the user turns back to the normal week programm again. The application is intended for "normal" people, they can use digital devices, but are no experts. There also has to be a readme with simple installation instructions and basic documentation on how to use the thermostat.

2 Brainstorm √

We started our brainstorm by making a list of the specifications, which can be found in the introduction. After that we divided the designing into multiple categories and discussed the pre and cons per category.

2.1 Start screen √

We quickly agreed that the starting screen would also be the place to adjust the current temperature and override the week programm. We found it useful to have a plus and minus button as well as a scroll bar for adjusting the temperature. The scroll bar is for bigger, less accurate adjustment, while the buttons are for small really precise adjustment. This way the user won't have to press a button a lot of times, nor scroll left, right, left, etc. to get the temperature he desires. We add a label with the current temperature and one with the temperature that the user is setting the thermostat to. That way the user can more easily see what effect his actions will have. As some extra's we would like to add the current time, if the heating system is active or not, whether the thermostat is in day or night mode and a button to return to the temperature set in the week programm. This will provide system status and action feedback for the user and make for a nicer design with more options. Then finally we need a pop-up menu where the user can choose to edit the day/night temperatures, edit the week programm or apply vacation mode. We want this to be as much like standard android menus as possible. That way the user won't have to learn this menu, he will recognize it's structure and know how to work with it.

2.2 Week programm

In the design of the week programm we want to stick to the standard menu design of android applications as well. We had a short discussion on whether the week should start on Sunday or on Monday or whether we should let the user decide. We decided for Monday, for this is the more standard and having the user choose would complicate the use of the application. In the menu the user will see a list of the days where he can pick one to edit the settings for this day.

He will get a new screen that will consist of the current list of times at which the thermostat will switch modes for this specific day. At the top of the screen the user can see what day is selected and click on next or previous day. At the bottom of the screen there will be the buttons add, copy and cancel. When the user clicks the add button he will get a pop-up screen where he selects the new time and day/night mode. We wanted to give a message: "would you like to add another time?" to either go back to the add menu or to the day menu. Though this seemed too much work for too little improvement of the application, so we decided not to. By pressing the copy button the user will get a menu where he can choose the day he wants to copy this days settings to. We wanted it to be possible to copy the settings to multiple days at the same time, but decided against it because it would be more error prone. The user will get a message: "Are you sure you want to copy these settings to ...day?" to prevent errors. This because copying will delete the settings that originally were in the day we are copying to. The cancel button will get the user back to list where he can choose a day.

To edit or delete a time that is already in the list the user should simply select it and choose the option he prefers. When choosing delete the user will first get a warning that proceeding will delete this setting and to continue he has to press ok. If a user chooses to edit a time he will get to the same screen that he would get when adding a setting. This time the current settings are already in it and the user can edit them and save them as he would for adding a setting.

2.3 Day/night temperatures $\surd$

This menu will be reachable through the main menu and will allow the user to specify his day/night mode temperatures. We want the screen to look like the main menu as much as possible, for then the application will be easier in use. Therefore it will contain the plus and min button, the scroll bar and a label with the temperature the user is setting the thermostat to. These elements will be arranged in the same way as on the menu screen, but will appear twice. Once for the day mode and once for the night mode and below this there will be an apply button. When the user presses the apply button the temperature the user set the thermostat to will be saved.

2.4 Vacation mode $\surd$

The user can set the thermostat to vacation mode by pressing this option in the main menu. He will then get a screen where he can turn the vacation mode on/off and set the temperature the thermostat should then maintain. The setting of the temperature is once again the same as on the main screen: with buttons, a scroll bar and the temperature label. To apply this mode however the user has to save the new settings. Afterwards a notification will be visible on the main screen that the vacation mode is activated and more importantly the current mode will change to vacation mode. Every option of editing the temperatures will be disabled until the user turns vacation mode off again. This will again result in a notification that the vacation mode is now disabled and the user can edit temperatures again.

2.5 Evaluation $\surd$

Our brainstorming session was fairly brief and went very supple. We all prepared at home and thought about how to design the application and therefore we already knew what we wanted. We only had a few things that weren't clear right away, like on what day the week should start and where to put the menu for the the day/night temperature. On that second one we decided it should be in the main menu and not in the week programm menu. That way the user can change the temperatures outside of the week menu, which we think is easiest, though it would fit in the week programm menu as well. We used elements from standard androïd application wherever possible, as well as the systems own back and menu buttons. We made some changes in the first design since this gave better usage of the application or easier implementation with the same results. Most of our ideas we kept though and this became our end product.

3 Literature list (resources)

- *Sakai*
  `http://sakai.win.tue.nl`