

# **IST 331 EXTRA CREDIT**

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## Task Statement

The objective of this study is to analyze the efficiency and user experience of the alarm function in the Nokia 6126 cell phone. In order to determine how well a user can use the alarm function, we will survey 7 varied cell phone users, do several time trials of setting the alarm, count the errors that are encountered, and ask the users to identify any complaints or recommendations that they might have. It is important to note the background information of these 7 participants as their particular information might vary from population as a whole.



**Figure 1:** Nokia 6126 cell phone

## Participant Background Information

The participants in this study will be members of my extended family who are getting together to celebrate the Easter holiday. All participants will have prior experience with cell phones to eliminate the section of population who does not use modern cell phone technology. The range of ages will vary from young high school students to middle-aged mothers and fathers. Purpose of cell phone usage and experience with past cell phone technologies will vary but be noted in the survey conducted at the beginning of the study.

The surveyor obtained verbal consent from project participants at the beginning of each study. The surveyor explained that the study was for a school project in improving technology designs and explained that the study would take approximately 20 minutes, but the participant could back out at any time he or she wishes to. Background information was collected at the beginning of each study before any cell phone was touched.

The following criteria and reasoning was selected for the initial survey:

- **Name** – *Background information; unique identification of participant*
- **Age** – *Background information; relative knowledge of whether or not the participant grew up in the cell phone generation*
- **Relationship to Surveyor** – *Background information; notes the relationship the participant might have with surveyor that could alter results*
- **Years Using a Cell Phone** – *Understanding of a participant's experience with cell phone technology*
- **Self-Technology Appraisal** – *A self-appraised 1-5 rating of technology awareness/understanding*
- **Reasons For Using Cell Phone** – *Explains regular function of cell phone use*
- **How Often Use Alarm Function** – *Notes prior experience with the particular task that is being measured through the study; more experienced users will have an advantage over less experienced users*
- **Number of Cell Phones Owned** – *Will summarize experience with different cell phone software packages, brands, and all around diversity in the cell phone market*
- **Current Cell Phone Brand** – *Will list the software package that the participant is currently most used to using*
- **Prior Experience with Nokia** – *'Yes' or 'No' variable that shows participants'*

*prior experience with the software package of the phone being used in this study*

The table below shows the results obtained from the survey:

<b>Name</b>	<b>Karen Yakabosky</b>	<b>Ed Yakabosky</b>	<b>Christen Yakabosky</b>	<b>Marissa Polachek</b>	<b>Kelsey Polachek</b>	<b>Donna Korba</b>	<b>Ralphie Jachimiek</b>
<b>Age</b>	52	50	24	17	14	43	29
<b>Relationship</b>	Mother	Father	Sister	Cousin	Cousin	Aunt	Uncle
<b>Years Using</b>	8	10	9	3	1	6	8
<b>Tech Appraisal</b>	1	2	3	3	3	3	4
<b>Reasons for Use</b>	Contact with Family	Contact with Family, Work	Friends, Text message, Family, Pictures, alarm	Friends, Text message, Family, Pictures, alarm	Friends, Text message, Family, Pictures	Contact with Family, work	Contact with Family, work, friends, text message, schedule, alarm
<b>How Often Used</b>	Weekly	Daily	Hourly	Hourly	Hourly	Daily	Hourly
<b>Number of Cell Phones</b>	2	4	5	2	1	2	5
<b>Current Brand</b>	Samsung	Samsung	Motorola	Nokia	Motorola	Motorola	Samsung
<b>Experience with Nokia</b>	No	No	Yes	Yes	No	No	Yes

**Figure 2:** Participant Background Information

## Data Collection

Data was collected for each participant, one at a time. Participants were taken into a separate room with a locked door where no one could interrupt the process or gain insider information of the study.

Data collection consisted of three trial runs of setting the alarm for approximately ten minutes from the current time that the phone was displaying. Additionally, to test long-term memorability, the process was completed, again, three days later. During each trial, the surveyor timed the participant using a stopwatch. The surveyor also asked the participant to think aloud – that is, to discuss what was going through their mind as they progressed from screen to screen. The surveyor did not have any recording technology, so he noted these think alouds using paper and pencil in summary form. The think aloud method was used so that the surveyor could note what problems or confusion the participants faced but might not normally vocalize as they progressed through the screens.

The following trial run numbers were obtained:

Name	Karen Yakabosky	Ed Yakabosky	Christen Yakabosky	Marissa Polachek	Kelsey Polachek	Donna Korba	Ralphie Jachimiak
<b>Run 1 Time</b>	95 seconds	42 seconds	35 seconds	22 seconds	46 seconds	43 seconds	24 seconds
<b>Run 1 Errors</b>	7	2	1	0	2	2	0
<b>Run 2 Time</b>	31 seconds	19 seconds	20 seconds	19 seconds	29 seconds	23 seconds	18 seconds
<b>Run 2 Errors</b>	1	0	0	0	1	0	0
<b>Run 3 Time</b>	17 seconds	17 seconds	19 seconds	18 seconds	21 seconds	20 seconds	17 seconds
<b>Run 3 Errors</b>	0	0	0	0	0	0	0
<b>3+ Run</b>	27 seconds	19 seconds	20 seconds	19 seconds	26 seconds	22 seconds	22 seconds
<b>3+ Run Errors</b>	1	0	0	0	1	0	0

**Figure 3:** Timing and Errors

The surveyors' think aloud notes of each participants' trials are transcribed below:

**Karen Yakabosky**

**Run 1:** Expressed that she had no idea where to start. Decided she would just go through each main menu item and skim them until she found it. Eventually found it at the 8<sup>th</sup> main menu item, regarded how difficult that was and that something should be clearer. Stared at time setting for a few seconds before setting it.

**Run 2:** Could not remember exactly where she went so checked the main menu items around it, went to the wrong one first, then found right one. No problem setting alarm this time.

**Run 3:** Went straight through and set with no problems, said how easy it was now that she knew what she was doing.

**3+ Run:** Similar to run 2, she said she didn't exactly remember how to do it but remembered the general idea; and again, she went to the wrong main menu item first. She said some people might think it is under Settings because that is where you set your clock time – she doesn't like it being under the ambiguous title "My Stuff."

**Ed Yakabosky**

**Run 1:** Was not sure where to go the first time. Looked under Settings and Options first, but he said he wasn't surprised they were not there – he said that all cell phones are confusing and there isn't a really great place to put anything. Once he got to the Tools menu of the My Stuff main menu, he said it would be nice if there were a Tools menu on the main page. He said some of the other main menu stuff is less relevant. No problem setting time.

**Run 2:** Very straight forward, no problems encountered, knew exactly what to do.

**Run 3:** Very straight forward, no problems encountered, knew exactly what to do.

**3+ Run:** A little more hesitant because he had been away for three days but knew he knew what to do; just lacked confidence. No problems in the end.

**Christen Yakabosky**

**Run 1:** She said she wasn't sure where to start but would check under Settings first because the icon has a picture of a clock. When it wasn't there she was a little surprised but went back and found the right spot, set the clock with no problem.

**Run 2:** Encountered no problems, knew exactly what to do, mentioned how easy it was to set the alarm with the up-down interface.

**Run 3:** No problems, didn't say anything, just breezed through.

**3+ Run:** Said she remembered exactly what to do and breezed through with no problems.

**Marissa Polachek**

**Run 1:** Said she knew exactly what to do since she owns the same phone and uses it every night as an alarm. She proceeded through with no problem.

**Run 2:** Had absolutely no problem breezing through, didn't say much.

**Run 3:** Had absolutely no problem breezing through, didn't say much.

**3+ Run:** Had absolutely no problem breezing through, said she's been setting the alarm every night anyway so it wasn't really a three-day absence for her.

**Kelsey Polachek**

**Run 1:** Wasn't really sure where to start, said she'd click into random menu items until she saw something that would help her. Clicked into two wrong ones before seeing Tools and mentioning that it was under there on her own phone, so she looked for it there and set the alarm with no problem.

**Run 2:** Wasn't really sure where she had clicked earlier but had a general idea from memory. She went into a different item first and swore, then returned, and found the right item.

**Run 3:** No problems, seems she has learned the system completely.

**3+ Run:** Very similar to 2<sup>nd</sup> run, she remembered the general area that the Tools button was under but went somewhere else before the right one. Once she went to the right one, the actual setting of the alarm was very easy.

**Donna Korba**

**Run 1:** Reminiscent of Kelsey's first run where she thought about what her own cell phone does and looked for something similar. She eventually found the Tools menu after making two mistakes first going into Settings and then Options before finding the needed My Stuff. She set the alarm with no problems.

**Run 2:** Seemed to have learned system and proceeded with no problems. Mentioned how nice it was that the phone displays the current time at the top of the alarm setting screen so that can set a certain timed alarm if possible.

**Run 3:** Again had no problems but mentioned that it would be nice to set a "10 minute" "half hour" "hour" type snooze feature so don't have to manually set the alarm.

**3+ Run:** Seemed a little hesitant, said that she thought she knew what to do but wasn't 100% sure but would try anyway. Ended up being completely right, set alarm with no problems.

**Ralphie Jachimiak**

**Run 1:** Mentioned how most cell phone technologies are the same and how software bundles don't really change too drastically over time. Said this was a little different from past Nokia phone but still recognized basic interface. Proceeded through and set alarm with no problem.

**Run 2:** Had no problem setting alarm, didn't say much.

**Run 3:** Had no problem setting alarm, mentioned how it seemed a little mundane to go through so much little ups and downs just to set an alarm for 10 minutes from now.

**3+ Run:** Said he remembered everything clearly and set alarm with no problems.

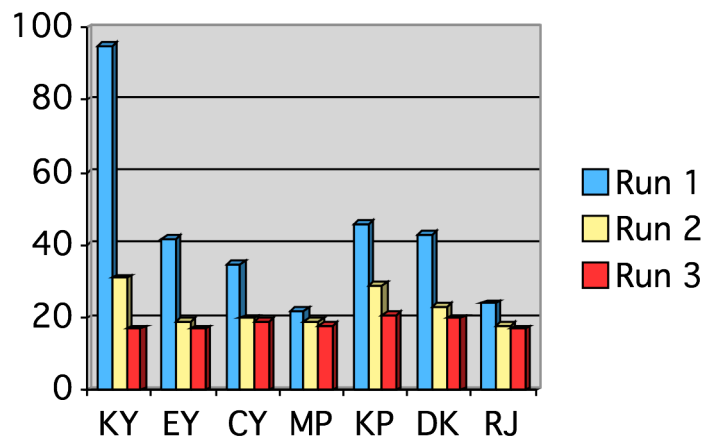
**Figure 4:** Think Aloud Notes

## Results & Analysis

### Learnability

We determine learnability of the alarm setting system for the Nokia 6126 cellular device by examining the difference between Run 1 and Run 3 of each participant. At a glance, one can easily see drastic improvements in timing after running through the system only two more times. This is ideal for cell phone users as they will probably be repeating common functions thousands of times after the first time they do it because cell phones are usually a long-term usage device.

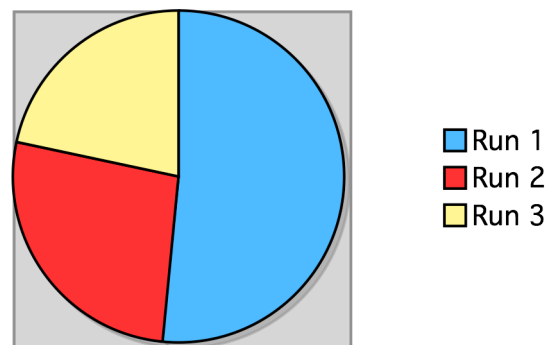
To further show this analysis, we create a histogram that shows the differences in these times visually:



**Figure 5:** Difference from Run 1 to Run 3

As you can see, the red blocks are clearly shorter than the blue blocks, showing how timing drastically improved over time.

Additionally, if we analyze the times taken for Runs 1, 2 and 3 as percentages and put them into the pie chart shown below, it is clear that Run 1 takes up more time than Run 2 and Run 2 takes up slightly more time than Run 3. I estimate that speed will increase as number of times setting the alarm increases, symbolizing substantial learnability.

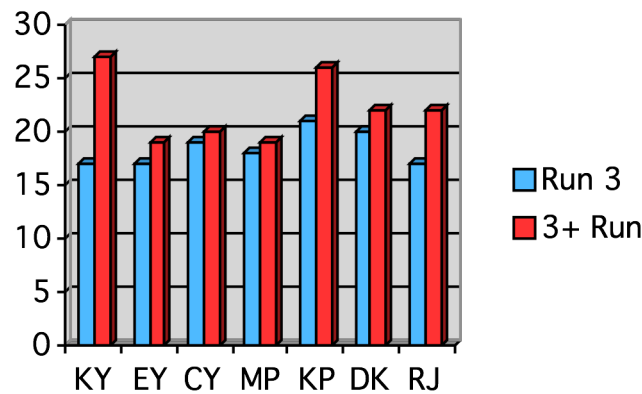


**Figure 6:** Average times of Run 1, Run 2, Run 3

## Memorability

Memorability is correlated to how well a person can recall how to perform a function over time. The surprise, 3-day later, time trial for setting the alarm serves as our measure of how memorable the device is. At a glance, we see a slight drop in speed; but it does not vary significantly. We can attribute these changes to nervousness or drop in confidence due to absence from use because several participants pointed this out during their think aloud sessions. Most of the participants remembered how to correctly set the alarm, but they felt less confident because they had not seen it in awhile. This is a very minor difference and not substantial to the overall system. Users who will use the alarm regularly will not experience the diminishing times, and users who do will barely suffer from the change.

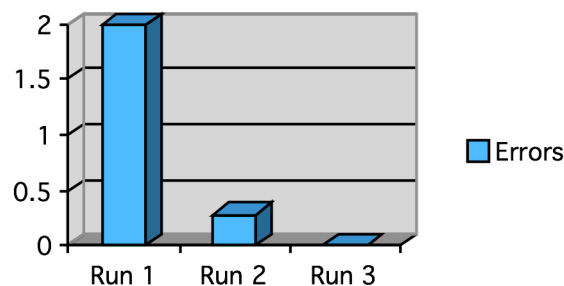
The histogram below demonstrates the strong memorability of the product.



**Figure 7:** Memorability from Run 3 to 3+ Run

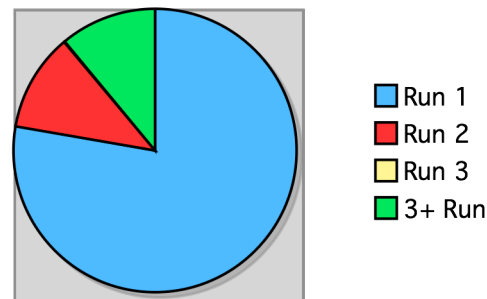
## Errors

Project participants encountered far more errors in the first round of the trial runs than in latter runs. Generally, they experienced even fewer errors the third round than the second round. Due to learnability, this demonstrates diminishing error. The histogram below, showing average number of errors per round, demonstrates the diminishing error with its clearly positive skew.



**Figure 8:** Difference from Run 1 to Run 3

This is further demonstrated by the pie chart in **Figure 9** where we show which rounds each error occurred in. The first round clearly has the most errors, and the third round has the least.



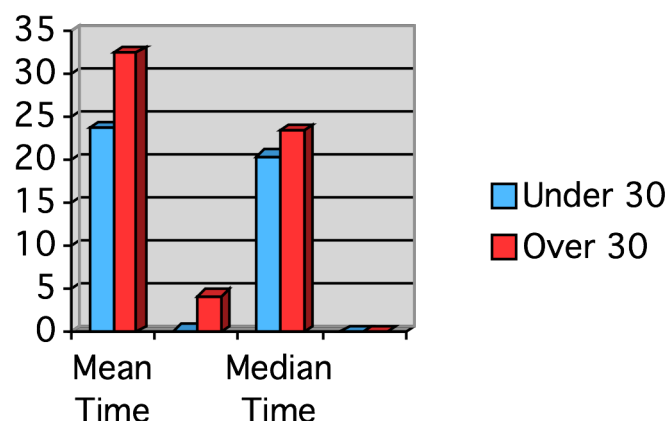
**Figure 9:** Errors per Round

Based on our think-aloud transcriptions, these errors can be attributed to several specific topics. The number of errors encountered seemed to ALL focus around finding where the alarm setting mechanism is in the system. More specifically, users were unable to find the correct option, My Stuff, to select from the main menu. Once users did find this option, they had very little problem going through the Tools Menu and actually setting the alarm. We can attribute the errors to a poor hierarchical design.

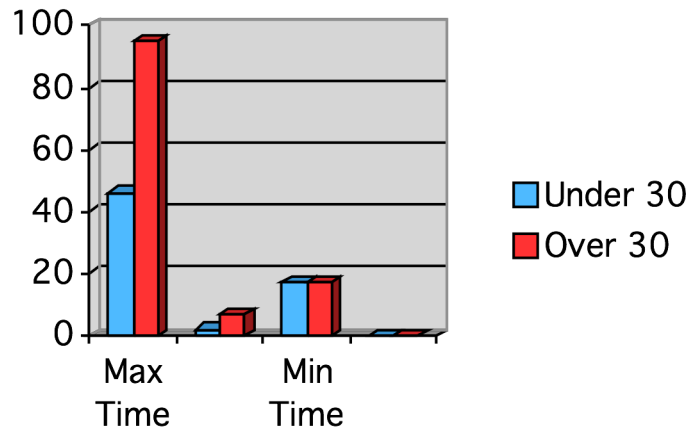
### Age/Technological Experience

Our final analysis revolves around the difference in familiarity with cell phones based on age. Because cellular technologies began to emerge in the 1980s, when individuals who are presently 30 were still children, I decided to separate my research group into two sections: those over 30 and those under 30. Without quantitative analysis, this would be very difficult to analyze.

Instead, the histograms below describes the mean, median, and maximum/minimum in both terms of timing and errors.



**Figure 10:** Young versus Old I



**Figure 11:** Young versus Old II

As you can see, especially from the mean, the individuals in the younger groups are clearly more familiar with the technologies and adapt to new challenges better. This aligns with the idea that these participants were still developing when these types of technologies emerged so they are better prepared to learn them in the adaptive environment. This should encourage cell phone manufacturers to recognize that younger generations will be better prepared for more complex, more advanced systems.

## **Improvement Recommendations**

### **Main Menu Option**

Almost all of the participants seemed to recognize that the alarm function would be under the Tools menu once they were able to find it. Only about half of them knew to look under “My Stuff” from the actual Main Menu; and the few who did had prior experience with Nokia phones, so the My Stuff menu is clearly not very intuitive. I would move the Tools menu to the Main Menu and eliminate something that is not as necessary such as Games or E-Mail. E-Mail, in particular, could probably be moved under either Tools or Messaging. There are a number of other options under Tools that the user might have trouble finding such as the Calculator, Calendar, and Notepad. I believe that moving this option to the main menu would greatly improve design and reduce errors.

### **Physical Button**

A few of my project participants use their phones as cameras, and the Nokia 6126 features a physical on the phone that quickly opens the camera; but I believe that most users use the cell phone alarm more frequently than the camera. In younger participants, they tend to use the phones more for their regular alarm clocks (myself included). It would be quite easy to either replace the physical camera button – or even better – simply add a tiny alarm physical button to make it quick access.

### **Snooze Feature**

Some of my project participants expressed displeasure that they had to click the up button ten times just to set the alarm for 10 minutes later than present time. A great solution to this would be to include several “quick snooze” options. Increments of 10 minutes, half hour, one hour, 4 hours, and 8 hours could be used quite effectively to let people looking for set amounts of rest be able to set their alarm without going through the tedious process that participants complained about.

## **Conclusion**

This study has produced valuable information to the designers of the Nokia 6126 cell phone as they plan for future implementations of the alarm feature. It shows a variety of user groups and how they feel about the alarm technology. I hope they take these findings into consideration when doing future systems development.