Increasing Microsoft Office Usability for Middle-Aged and Elder Users with Less Computer Literacy

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Abstract—In the recent years, one of the most important factors that influence software marketability is software interfaces. In this marketing rat race, Microsoft created a revolution in its Office software. In year 2007, they replaced menus and toolbars with a new structure called it Ribbon interface. Although the new interface has many advantages, usability researchers are criticizing MS Office interface from different aspects. They believe, it still has serious usability issues that hinder usage of MS Office for users with less computer literacy. Since middle-aged and elder users with less computer literacy are a large group of users who need to work with MS Office, this study aims to increase the learnability level among them by proposing an interface design solutions for MS Office. This research utilized in-person usability testing to evaluate the usability issues of MS Office in terms of both visual and cognitive issues. In order to ensure the validity of the data, it was tried to triangulate the data collection process by collecting data from different sources, namely, quantitative measurement of users’ improvement, direct observation, and interview. The results of data collection has led to design a prototype for MS Office. Based on the usability test on the prototype and finding the factors that has led to users’ improvement, a number of solutions are extracted for MS Office interface as a contribution to the body of knowledge. Putting these solutions into action, self-learning would be promoted and learning issues of middle-aged and elder users with less computer literacy would be decreased.

Index Terms—user interface; microsoft office; elder novice users; usability; middle-aged novice users.

I. INTRODUCTION

Software development companies, need to release a new version of their products periodically to ensure their survivability and Microsoft is not an exception to this rule. In year 2007, the new version of Microsoft Office was released with a completely different interface. In this version there was no classic menus or toolbars and they were replaced with tabs. It means tools are categorized in the tabs and just one menu existed that shows the functions such as “New”, “Open” and “Save”. This new interface solved the previous versions usability issues which has made Office work area small and confusing. The issues such as number of toolbars, arrangement of toolbars and long menus.

The new interface is called Ribbon. Ribbon has many advantages such as making the software interface organized and less crowded by categorizing tools in tabs. Furthermore, grouping similar tools automatically based on the screen size, is another advantage of using Ribbon (MSDN, 2012) [1]. Despite all the benefits of Ribbon, there are still research issues pertaining to the usage of Ribbon which is not solved yet (Keizer, 2010) [2]. Issues such as the existence of too many tabs in each view (Kyd, 2009) [3] and organization of tools in the tabs that are not based on a specific structure (Wildam, 2008) [4]. These issues can cause difficulties for users, especially middle aged and elder users with less computer literacy. These users are people above 50 who do not have background knowledge and work experience with computer. Since in older ages some cognitive characteristics such as information processing and memory changes, these changes should be considered in user interface design (Wirtz et al., 2009) [5].

The present study hypothesizes that it is possible to enhance self-learning in MS Office and decrease the learning issues among middle-aged and elder users with less computer literacy by considering their similar problems and design suggestions. The purpose of this research is to introduce user interface design solutions for MS Office which increases its usability for middle-aged and elder users with less computer literacy.

II. THE TECHNIQUES OF DESIGNING USER INTERFACE FOR MIDDLE-AGED AND ELDER PEOPLE

Old people cannot adapt themselves to every user interface design since they do not have any computer background from their childhood and young era, so we should not expect them to learn software like young people with computer background (Xie, 2003) [6]. Furthermore, older users need more descriptive texts to identify software components and correct mistakes (Wirtz et al., 2009) [5]. Dickinson et al. (2005) [7] suggested that for increasing the tendency of elder users to use computer, our interfaces should have the characteristics such as
“simplified interface, reduced clutter on the screen, reduction of terminology, clear and simple navigation paths, and a particular type of help”. Sayago and Blat (2010) [8] approved Dickinson et al. (2005) [7] by suggesting designing techniques such as easy layout, using large font, proper icons and descriptive texts.

III. THE CURRENT PROBLEMS OF MS OFFICE RIBBON INTERFACE

From the release time of MS Office 2007 until now, software usability researchers are criticizing its interface. The researchers such as Ericson (2006) [9] indicates that users might find difficulties adopting the Office interface. The reason is that for accessing tools they need more key-presses or clicks to activate them. Wildam (2008) [4], as a software developer, believes that organization of tools in the tabs are not based on a specific rule. Furthermore, Microsoft did not organize many tools well in the tabs, for instance putting “Macros” tools in the “View” tab was not a wise decision. Since there are many tabs in every software and users have to learn all of them; users will never truly know the Ribbon structure and the place of tools (Kyd, 2009) [3]. For both new students and also more professional ones, the approach to learning the Ribbon interface seemed to be difficult due to the fact that they had to memories the hierarchy of tab names, group names and the commands (Tabrizi, 2013) [10]. After the release of Office 2010, enterprise IT professionals still think the interface is confusing and in contrast with Microsoft claim about solving its training issues, it still has usability issues (Keizer, 2010) [2]. According to the mentioned researches, Ribbon interface structure needs fundamental changes to become usable for all groups of people. The changes that decrease the number of tabs and arrange tools in tabs is a more logical way. The mentioned problems indicate that, it is obvious Office interface cannot be easy for novice users especially middle aged and elder users with lack of computer literacy. Furthermore, as it can be seen in the literature, researchers just criticized the Office interface without presenting any solutions for users with less computer literacy. In order to fill the gap, this research tried to discovers middle age and elders’ issues with Office interface and propose design solutions to solve the issues.

IV. RESEARCH APPROACH

In this study an in-person usability testing was used to evaluate the usability issues of MS Office in terms of both visual and cognitive problems. In order to ensure the validity of the data, the researchers tried to triangulate the data collection process by collecting data from different sources, namely, quantitative measurement of users’ improvement, direct observation, and interview. In the first step of the study MS Outlook 2010 was selected as a sample software for data collection and nine tasks were assigned to ten participants. The purpose of the tasks was to recognize MS Outlook usability issues. The performance of each participant in performing the tasks was measured and written in separate forms. Furthermore, in order to collect participants’ problems and design suggestions, direct observation and Interview were utilized. Based on the participants’ major problems with the original interface and their suggestions, a proposed user interface was designed for MS Office as a prototype. The same evaluation process as the original version was iterated to validate the prototype and measure participants’ improvement. Based on the factors that improved participants’ performance, the design solutions for MS Office were extracted.

A. Sample Software Selection

In this study MS Outlook 2010 selected as sample software. The first reason for selecting MS Outlook was that the researchers wanted to select one of MS Office software whose usage was easy to understand for all participants and they did not have work experience with that. The second reason was, MS Outlook has four independent usages, naming, managing appointments, meetings, emails and tasks, so restructuring its interface is more complicated than the software that just have one usage. Therefore, finding design solutions based on MS Outlook can be useable for other MS office software.

B. Participants Selection

The participants of the study were ten people with less computer literacy, who were chosen from among personnel and students of Apple English Institute in Kuala Lumpur with the use of a validated computer skill placement test adopted from Singh and Dyer (2002) [11]. The selected Participants’ are four male and six females between ages 52-66. They were suitable for the present study since they; a) did not have a good computer background knowledge, b) do not work with computer a lot, c) are not familiar with any professional software or programming languages d) are not good with MS Office and e) see MS Outlook for the first time.

The reason for selecting just 10 participants is that according to Nielsen (2000) [12], Sauro (2010) [13] and Richards (2011) [14] carrying out a usability test is reliable with only five participants.

C. Training Class

Since the participants were not familiar with MS Outlook at all and researchers wanted to know if participants can find and remember tools just by knowing the structure of the software, they took part in an MS Outlook introduction class. The class just took 45 minutes. The reason for having a short class is that the researchers did not want to teach participants Outlook in detail. He just wanted to teach the totality of MS Outlook structure.

D. Tasks Assigned to Participants

In this study, the tasks that were given to participants are chosen in a way that can make participants work with different parts and functions of MS Outlook completely. These tasks are: 1) Forward an email (The ability of finding a command in the tabs), 2) create a new email and attach a file to it (The ability of finding command and browsing files), 3) Create a new email and print it (The
ability of using File Menu), 4) Create a new email, draw a table in its content and change cells color (The ability of remembering the place of tools in the tabs), 5) Create a new meeting, add a column chart into its content and add value label to its columns (The ability of remembering the place of tools in the tabs), 6) Create a new task and set a follow up for it (The ability of finding a command in the tabs), 7) Create a new folder in MS Outlook and set a rule for emails with a specific characteristic to move to this folder automatically (The ability of recognizing sequence of tasks in different tabs), 8) Create a new signature for using it frequently (The ability of using “MS Outlook Option”) and 9) Use MS Outlook “Help” to convert your email text to a table (The ability of adapting help to tools).

E. Data Collection

In the process of data collection, for each participant, an evaluation form containing three parts was filled by the researchers in both MS Outlook original version and proposed version. The first part was filled by quantitative data about tasks completion, duration and number of clicks. The second part was filled based on researchers direct observation about participant problems with the tabs. The third part was an interview with the participants. It had three questions which were asked orally from the participants. The first and second questions were about their main problems with the current interface and their suggestions for designing a new interface. The third question asked if they can work with MS Outlook completely with just learning the structure.

F. New User Interface for Microsoft Outlook and Its Evaluation

According to the direct observation and interview results; a proposed user interface prototype was designed for MS Outlook. Since the researchers wanted to create a interactive prototype, IndigoRose AutoPlay Media Studio 8 was used. The proposed interface was taught to the experimental group in 30 minutes. The only concept that was taught to the participants was the proposed structure of Ribbon and File Menu. Similar to the process of original interface usability test, the same tasks were assigned to participants and a similar form was filled by the researchers. In order to decrease the learning effect, the time interval between the original interface experiment and proposed interface experiment was 62 days.

G. Proposing User Interface Design Solutions

The results of MS Outlook original interface evaluation form and MS Outlook proposed interface evaluation form were compared to measure the improvement of the participants. The significant improvement in performing the tasks and their satisfaction during interview has led to prove the proposed interface. According to the factors that has led users’ improvement and solved MS Outlook usability problems, user interface design solutions for MS Office for middle age and elder users with less computer literacy were extracted.

V. RESULTS AND THE PROPOSED INTERFACE CHARACTERISTICS

A. Results of MS Outlook Original Version Evaluation Form

As explained in the methodology after participants were taught MS Outlook, nine tasks were assigned to them and an evaluation form was filled by the researchers. The following tables show the results’ summary of task measurements of MS Outlook original interface evaluation forms.

Table I shows percent of participants who could complete each task, Table II shows the average number of steps taken for each task and the average time duration spent on each task, was shown in Table III. The results for each participant is presented in appendix.

Based on the researchers direct observation and interviews the most significant participants’ problems are as following:

a) They did not understand the usage of menu and clicked on it for many times to find a tool, b) They thought tools button are not large enough, c) They got lost in the software environment and number of tabs made them confuse, d) They liked to use MS Outlook Help, but they had problem to find a proper result. Furthermore, sometimes they lost help window when they clicked on other windows. In some cases MS Help results were not understandable for them, e) Tool-tips were not enough for participants to work with tools completely, f) They said, tool shapes are not clear. They believed that they cannot understand the usage of tools from its icon.

Based on the interviews the similar participants’ suggestions are as following:

a) Use bigger and more meaningful icons for presenting tools, b) Showing just useable tools and removing unnecessary tools that are shown at a given time, and c) Showing the usage of tools completely near them.

In order to answer the interview question about their ability to learn MS Outlook with just knowledge of its structure, 100% of them believed that they cannot work with MS Outlook completely just with a short class or learning the structure.

| Table I. Percent of Participants Who Could Complete Each Task in MS Outlook Original Version (T=Task) |
|---|---|---|---|---|---|---|---|---|---|
| T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 |
| 60% | 30% | 30% | 30% | 30% | 70% | 20% | 10% | 20% |

| Table II. Average Number of Steps for Each Task in MS Outlook Original Version |
|---|---|---|---|---|---|---|---|---|---|
| T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 |
| 5.4 | 9.5 | 6.3 | 14.6 | 11.1 | 4.2 | 10.5 | 12.9 | 19.7 |

| Table III. Average Time Duration for Each Task in MS Outlook Original Version |
|---|---|---|---|---|---|---|---|---|---|
| T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 |
| 47.2 | 60.5 | 100.64 | 120.32 | 152.62 | 60.90 | 166.20 | 172.56 | 160.94 |
B. The Characteristics of the Proposed Interface

Based on participants’ similar problems and suggestions, a new user interface was designed for MS Outlook. The changes that are made on MS Outlook original interface can be categorized in two main groups: a) The changes that are made on File Menu, and b) The changes that are made on Ribbon.

1) File Menu’s new structure

Researchers used File Menu as a master menu for putting all main MS Outlook commands and tools with a specific categorization and changed its name to Menu. This proposed Menu has four advantages:

a) Controlling the number of tabs

All the tools that could be used by users for creating new tasks or objects, such as new email and graphical objects, are removed from the tabs and are put into the Menu. These changes have two benefits:

- The tools of certain tabs, such as “Insert” are moved into the Menu, so some tabs are removed and they decreased in number. In the proposed prototype the number of tabs shown at the same time are between two to five but in the original version it is between five to ten tabs.
- The only thing that has remained in the tabs are editing tools. Therefore, the Menu plays the role of a controller and by clicking on each tool in the Menu only the related tabs are shown.

b) Putting simultaneous help system

In Menu, commands and tools have a descriptive text and a step by step visual instruction with an easy English text. Therefore, users will no more click on an incorrect tool or command and they will not get confused about how to work with tools. Furthermore, users do not need to search the content of “Help” for getting instruction.

c) Using better icons

Researchers used more meaningful icons to present tools and commands in Menu. He replaced classic icons with descriptive icons.

2) Categorizing of tools

The categorizations of tools in the menus are based on their similarities and their usage. For example all the Email tools are placed in the “Emails” category or all the graphical elements that user can add to the content are placed in the “Insert graphical objects” category. Fig. 1 shows a sample of proposed Menu structure.

2) New structure of Ribbon

In order to facilitate Ribbon structure two changes were made as following:

a) Change tools arrangement in the tabs

One of the major participants’ problems was that they were forced to read all the tools name from beginning to the end of each tab. This problem was solved by arranging tools in the tabs from more useful to less useful. It means the tools that user will need frequently are put in the left side and the tools that user will need less frequently are put in the right side of the tab. For example since when a user insert a picture the first thing is adjusting size, therefore, in format picture the tools related to picture size are put in the begging of left side of the tab. Fig. 2 shows the comparison between the original and the proposed grouping of commands.

b) New grouping of tools

In order to help the participants find tools and commands easily, grouping of most of the tools and commands in tabs were changed and new groups were created. One of the examples of new grouping is on the first tab of the new email. In this tab the tools related to changing text color was distributed in Basic Text and Clipboard groups. A new group with the name of “Text Coloring” was created and these tools are moved in this group. Fig. 3 shows the comparison between the original and the proposed grouping.

Figure. 1. Sample of proposed menu
C. Results of MS Outlook Proposed Version Evaluation Form

As explained in the methodology, after MS Outlook proposed version were taught to the participants, similar tasks to the original version were assigned to them and a similar evaluation form was filled by the researchers. The following tables show the results’ summary of task measurements of MS Outlook proposed interface evaluation forms.

Table IV shows percent of participants who could complete each task in MS Outlook proposed version, table 5 shows average number of steps for each task and table 6 shows the average time duration for each task.

Based on the researchers direct observation and interviews the most significant problems of participants are as following:

a) The tools instruction in the Menu was not enough for some of them, b) They clicked wrongly on the tabs’ picture of the menu instruction and c) they forgot to select the text before clicking on the tools to activate them.

Based on the interviews the participants had only one suggestion that emphasized on adding more text to menu instruction and describe the usage of tools in more detail.

The results of task comparison in MS Outlook original version and proposed version showed significant improvement in tasks completion and duration. Furthermore, interview results showed that 100% of participants have more satisfaction from proposed interface and 80% of participants felt they do not need to participate in any training class and read books or instruction file, under the condition that they are taught the structure of MS Outlook in the proposed version. These statistics showed that the proposed user interface
enhanced self-learning and helped participants in different areas:

- Enabled participants to do the tasks that they could not do in the original version.
- Increased the speed of participants in completing the given tasks.
- Decreased the number of steps that participants went through for performing their tasks.

Furthermore, observation results showed that the problems that participants faced in the original version were solved with the following solutions:

- Problems in understanding the usage of tools and tabs were solved by changing tools and tab names. Additionally, descriptive icons helped them significantly.
- Confusion for finding the tools and losing in the software was reduced by controlling the number of tabs that are shown at the same time by the menu.
- Problems with using Outlook “Help” and forgetting the usage of tools were solved by simultaneous instruction in the menu.

D. Proposed User Interface Design Solutions

Based on the factors that improved participants’ performance, Microsoft needs to change both File menu and tabs structure to increase MS Office usability for middle aged and elder people. These changes can be categorized in two main groups:

1) Using the menu in an efficient way:

- In order to decrease the number of tabs that are shown to users at one view, Microsoft can put the main tools of the software in a menu and just use tabs for putting editing tools related to the main tools.
- In order to introduce the usage and working instruction of tools before users click on them, Microsoft can add a simultaneous help system in the menu.

2) Changing the tabs structure:

- The arrangement of tools in some tabs should change. One of the best ways is arranging tools in the tabs from more useful to less useful. It means the tools can be organized from left to right side of the tab based on users’ need frequency.
- Microsoft should replace some of tabs and tools’ names with more meaningful names. Furthermore, it is better to replace some of tools group names with descriptive sentences.

These solutions are in line with the previous solutions to design interface for elders. The researchers such as Dickinson et al. (2005) [7], Wirtz et al. (2009) [6] and Sayago and Blat (2010) [8].

VI. CONCLUSIONS

This study tried to increase the satisfaction level of middle aged and elder users with less computer literacy. This could be fulfilled by discovering usability problems of MS Office, and solving the problems with proposing a novel user interface. The main phases of this research were: a) Discovering the problems that middle aged and elder users with less computer literacy face working with MS Office, b) Formulating a new user interface framework for MS Office, c) Developing a prototype and validating it, d) Proposing solutions for MS Office based on the factors that increased users’ performance as the contribution of the study.

The proposed solutions can help Microsoft to have a framework which guides them on how they can redesign and release a special version of MS Office that is understandable for middle aged and elder users with less computer literacy. Putting these solutions in action, self-learning would be promoted and users’ learning issues would decrease.

As a further research, the methodology of this study can be used with the use of participants in different age ranges to find the general user interface design guidelines for ribbon interfaces.

REFERENCES

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