

Usability Review of KDE Edutainment Project:
KHangMan

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Contents

| | | |
|----------|--|-----------|
| 1 | Introduction | 2 |
| 1.1 | KDE and the State of Open Source Usability | 2 |
| 1.2 | The KDE Edutainment Project | 2 |
| 1.3 | Children as an Audience | 2 |
| 2 | Goals of this Study | 2 |
| 3 | Approach | 3 |
| 3.1 | Technical Context | 3 |
| 3.2 | Predefined Tasks | 3 |
| 3.3 | Basic Principles of Usability | 3 |
| 4 | Results | 3 |
| 4.1 | Defined Task: Open KHangMan | 4 |
| 4.2 | Additional Task: Change Language Settings | 5 |
| 4.3 | Defined Task: Play a Game | 5 |
| 4.4 | Defined Task: Complete the Game | 6 |
| 4.5 | Defined Task: Create a New Game | 7 |
| 4.6 | Additional Task: Explore KHangMan Options | 7 |
| 4.7 | Defined Task: Quit KHangMan | 9 |
| 5 | Conclusion | 10 |
| 5.1 | Suggested Changes | 10 |
| 5.1.1 | Minor Issues | 10 |
| 5.1.2 | Medium Issues | 11 |
| 5.1.3 | Severe Issues | 11 |
| 5.2 | Overall Experience | 12 |
| 6 | Appendix | 12 |
| 6.1 | About the Author | 12 |
| 6.2 | Discussion and Comments | 12 |
| 6.3 | Reference Materials | 12 |

1 Introduction

1.1 KDE and the State of Open Source Usability

The K Desktop Environment is an open source graphical desktop environment for Unix workstations. The goal of KDE is create an easy to use environment free of charge and available for anyone to modify the source. The KDE group has taken steps to improve its usability by creating and revising human interface guidelines for its developers to follow.

The open source community is striving to make its software more usable. The current state of usability in open source software is less than satisfying. There are several groups dedicated to improving this and they are slowly making progress. More developers need to keep usability in mind when writing code and developing interfaces.

Unfortunately there are many projects and few usability volunteers and the progress is slow. Guidelines like the “GNOME Human Interface Guidelines” and the “KDE Human Interface Guidelines” are setting standards for developers. These guidelines help the developers create more consistent and intuitive designs which result in better usability.

1.2 The KDE Edutainment Project

The goal of the KDE Edutainment project is to create software which is both educational and fun. The audience of the software ranges from aged 3 to 18 and span subjects such as language, mathematics and science.

1.3 Children as an Audience

Children are a both an interesting and difficult audience to create software for. They tend to have a shorter attention span than adult users and do not comprehend tasks in the same way.

Specialized interfaces are necessary for younger users who are still developing their reading skills.

2 Goals of this Study

The goals of this study is to review the educational software included in the KDE Edutainment package and identify existing and potential problems in its usability and interface. Issues shall be identified with possible solutions for review.

The application under review in this document is KHangMan.

3 Approach

This is not a user test. It is a usability review in order to identify existing and potential interface and usability problems before a user test is performed.

3.1 Technical Context

The following is the computer setup used for the review:

- FreeBSD 5.1-CURRENT
- Multiuser networked environment, English language
- KDE v3.2.3
- KDE Edutainment v3.2.3
- KHangMan v1.3
- 1280x768 resolution (widescreen)
- Mouse, keyboard and speakers

3.2 Predefined Tasks

In order to fully review the application, a list of predefined tasks has been created. Undefined tasks will also be added as necessary during the review.

The following is a list of possible tasks during this review:

- Open KHangMan
- Create a new game
- Play and complete a game
- Quit KHangMan

3.3 Basic Principles of Usability

There are several loosely defined usability principles which are important to any application. Some of these are (not limited to) consistency throughout the interface, appropriate error handling, aesthetics of the design and documentation.

These principles are considered throughout the review.

4 Results

The following are the results of the predefined tasks, including several tasks added during the review.

4.1 Defined Task: Open KHangMan

KHangMan was opened through the command line by typing:

```
$ khangman
```

When first opened, the user is greeted by a blinking cursor in a “Letter” labeled text box near the bottom of the window. There is a KHangMan logo displayed, taking up most of the document space and two sections named “Misses” and “Word”. The labels are small and difficult to read. The blinking cursor implies the application opened to a new game.

Action

- Several characters are typed in the text box labeled “Letter”
- ENTER is pressed
- The character is registered as a guess and is displayed under the “Misses” label
- The KHangMan logo is replaced by the hangman box

The text box is fairly large and several characters were entered. The text box only allows one character to be typed.

Reactions

The assumption that the application begins with a new game was correct.

It was not immediately apparent that ENTER needed to be pressed in order to register the guess, and the error of entering more than one character occurred because the text box labeled “Letter” is very large.

The labels are very small and would be difficult for children to read.

Suggestions

The “Letter” text box could be made smaller so errors entering more than one character do not occur.

Adding a “Guess” button next to the “Letter” box could help guide the user as to how to submit their guess to the game.

The labels “Letter”, “Misses” and “Word” can be made larger so they are easier to read.

4.2 Additional Task: Change Language Settings

After a secondary scan of the interface, additional game information is noted in the status bar. The information reads: “Level: Easy, Language: German”. The testing language is English and must be changed.

Action

- Click on “Languages” on the menubar
- Select “English”

The status bar information changes to “Language: English” and the application resets to a new game.

Reactions

The action executed produced the results expected.

Suggestions

The default language should be the language of the user. This could be configured during installation.

4.3 Defined Task: Play a Game

The game is continued. In a test to generate an error, a character which has already been guessed is resubmitted.

Action

- Submit a character as a guess
- Submit the previous character as a duplicate guess
- A popup dialog appears with the message: “The letter has already been guessed.”

The dialog is dismissed by clicking “OK” and the game is continued.

Reactions

The application handles exceptions such as duplicate guesses. The popup dialog was a little intrusive.

Suggestions

The popup dialog is a little intrusive. An alternative would be a warning on the document.

Also, specification of which character was a duplicate guess would be informative. If the dialog is continued, specify it in the message. If the warning is changed to the document specify it in the message or highlight it in the “Misses” section.

From the time the guess is made to the distraction of the warning message, the user could possibly forget which character had been chosen and could make the mistake again. This is especially true with children who have short attention spans.

4.4 Defined Task: Complete the Game

To complete the game, characters must be successfully guessed before hangman.

Action

- Submit characters as a guess
- The word is successfully guessed
- A popup dialog appears with the message: “Congratulations! You won! Do you want to play again?”
- The option “YES” is clicked
- A new game begins

Alternatively the option “NO” can be chosen.

- A popup dialog appears with the message” “Congratulations! You won! Do you want to play again?”
- The option “NO” is clicked
- The application terminates

Reactions

Again, the popup dialog is a little intrusive. An alternate would be a message printed to the document.

The termination of the application after clicking “NO” was surprising and unexpected.

Suggestions

It was very unexpected that the application was terminated when the “NO” option was clicked. There is no indication that would be the result of the “NO” choice. A suggestion is returning to the current game so the user can view details about their game such as how many guesses were made and which letters were guessed.

4.5 Defined Task: Create a New Game

There are several ways to create a new game in KHangMan. A new game has already been created when the application opened, certain settings are changed (such as language) and when the game is over.

Action

- Click on “Game” from the menubar
- Select “New Game”
- A new game is created

Alternatively there is another way to create a game.

- View the toolbar
- Click on the new document icon
- A new game is created

Reactions

Creating a new game takes few steps and is a simple task to complete

4.6 Additional Task: Explore KHangMan Options

KHangMan can be customized by the user. There are several predefined levels of difficulty and the background theme may be changed. There are also configuration dialogs hidden within the menubar.

Changing the language has already been discussed.

Action

Change the level of difficulty.

- View the toolbar
- Click on the drop down menu labeled “Easy”
- Select difficulty level
- The difficulty level is changed

Reactions

When viewing the options for the difficulty level, an option labeled “Animals” was included.

After browsing the menubar, the option to change the difficulty level could not be found.

Suggestions

Including the category “Animals” in the difficulty settings is confusing. If there are word themes, they can be listed separately. The definition “Animals” does not state the difficulty level of the category like the alternate options.

The option to change the level setting in the menubar could not be found. All items in a toolbar must be included in the menubar.

Action

Change the background theme.

- View the toolbar
- Click on the drop-down menu labeled “No Background”
- Select background theme
- The background theme is change

Reactions

The different themes are very nice and appeal to younger users. The contrast between the text and the background color makes the text difficult to read.

After browsing the menubar, the option to change the background could not be found.

Suggestions

Contrast between the theme colors and the existing text must be changed. It is very difficult to see the already small text. A suggestion is changing the text color with the theme background so the text can have a high color contrast.

The option to change the background theme in the menubar could not be found. All items in a toolbar must be included in the menubar.

Action

Maximize the document using the provided button on the toolbar.

- View the toolbar
- Click on the maximize window icon (a square with pointing arrows)
- The document maximizes to screen size
- Click on the maximize window icon again
- Nothing happens

The application must be closed. When reopened, the maximized setting is still set. After browsing the menubar, neither a restore function nor the maximize can be found.

The configuration file must be deleted in order to reset the default window size. The language setting must also be reset to English.

Reactions

Maximizing the document did not enhance the game experience. The images scaled to the screen ratio (1.6:1) instead of scaling to a 1:1 ratio.

No way to restore the document to a smaller or original size could be found. Toggling the maximize button on the toolbar was ineffective. The option to maximize or restore the document could not be found in the menubar.

Suggestions

When the document is maximized, the skewed images are distracting and may be ineffective. Scale the images so when they increase in size, they do so in the correct ratio.

The maximize function does not enhance the game experience. A suggestion is to remove this functionality altogether so there is more control over the document layout. If the maximize function is included, a restore function is required.

The option to maximize or restore the document could not be found in the menubar. All items in a toolbar must be included in the menubar.

4.7 Defined Task: Quit KHangMan

Just as with creating a new game, there are several ways to quit the application. The game has already been terminated by choosing the “NO” option after a game.

Action

- Click on “Game” from the menubar
- Select “Quit”
- The application terminates

Alternatively there is another way to quit the game.

- View the toolbar
- Click on the red quit button
- The application terminates

Reactions

Quitting the game takes few steps and is a simple task to complete.

5 Conclusion

5.1 Suggested Changes

These are suggested changes to the game play and interface and may be discussed on the KDE usability mailing list. Many of the changes are in accordance to the “KDE Human Interface Guidelines”.

5.1.1 Minor Issues

These issues are minor and they do not have a serious effect on the game play but could improve the overall experience. The following suggestions could enhance the user experience.

Dialog Messages

The popup dialog messages may be distracting to the user. A user may be alarmed because of a previous association of popup dialogs and error messages. A possible replacement would be messages printed on the document. It is less intrusive and the user will know the message is associated with gameplay and not with failure of themselves or the application.

“Letter” Text Box

The “Letter” input text box is large and a user may try to input more than one character for a guess. Shorten the text box so that the need to enter only one character is apparent.

“Guess” Button

The action of pressing ENTER to submit a guess may not be apparent to all users. Some users feel more comfortable clicking an informative button. A “Guess” button next to the “Letter” text box could solve this.

5.1.2 Medium Issues

These issues have a medium severity and effect the user experience and gameplay. The following suggestions will enhance the user experience.

Label Size

The labels for “Letter”, “Misses” and “Word” are very small and are much smaller than the input text they label. Increase the size of these labels to at least the size of the text they are labeling. There should be no “:” after these labels.

Background Themes

Some of the colors in the background themes conflict with the color of the labels in the document and make the labels very difficult to read. Change the color of the labels with each theme so that there is a readable contrast.

Image Distortion

When the document is maximized, the images are distorted. Do not resize the images, or use images which are scalable. Resize the images at a 1:1 ratio so they are not skewed and distorted.

Menubar Items

Several toolbar items are not present in the menubar. They must be added.

5.1.3 Severe Issues

These issues are severe and have a serious effect on game play. They make the game unusable or so distracting that it disrupts the user experience. The following suggestions are strongly recommended.

Language Defaults

The default language must be set during installation to avoid confusion. Optionally menubar items should also be in the default language.

Maximize/Restore Document Size

The maximize functionality does not add to the user experience and is suggested to be removed. If the maximize functionality is retained, a restore function is necessary.

5.2 Overall Experience

KHangMan is a fun and educational application which is successful in the goal of the game hangman. There are several usability issues that need to be addressed, but most of these issues do not take much away from the experience of the game. It will be a successful edutainment project when the medium and severe usability issues are worked out.

6 Appendix

6.1 About the Author

Celeste Paul is a graduate student at the University of Pittsburgh. Her interest in human-computer interaction and open source technology has led her to participate in the open source usability community.

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6.2 Discussion and Comments

The contents and results of this paper may be discussed on the KDE usability mailing list. Discussion may be forwarded to kde-usability@kde.org.

6.3 Reference Materials

Jacob Nielsen, "Ten Usability Heuristics" (1994)

Jef Raskin, "The Humane Interface: New Directions for Designing Interactive Systems" (Addison-Wesley, 2000)

KDE Project, <http://www.kde.org/>

KDE Edutainment Project, <http://edu.kde.org/>

KDE User Interface Guidelines, <http://developer.kde.org/>