

An Interactive Tool for Knowledge Representation and Sharing On Android Operating System

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ABSTRACT: Android is an operating system for mobile devices such as smart phones and tablet computers. It is developed by the Open Handset Alliance led by Google. Android uses the Dalvik virtual machine with just-in-time compilation to run compiled Java code. Android has a large community of developers writing applications ("apps") that extend the functionality of the devices. We aim at developing a note sharing application, whiteboard which will be a handwriting note taker that features natural digital ink, an easy to work user interface (UI) and a comprehensive toolset that will increase the benefits of android users. The main aim of this paper is to be to develop the above features in order to enable users to take down quick notes without searching for any extra resources like a notebook, pen etc. This will make note taking to android users as easy as storing and accessing contacts. We also provide sharing facilities through e-mail which enhances the capabilities of this application.

Keywords: Android, digital notebooks, JAVA, Frames. Secondary storage

I. INTRODUCTION

In today's fast moving world the number of consumers using devices like smart phones is steadily increasing. Hence to enable these users to take down notes instantly in their phone without the need for searching any extra resources like a notebook, pen etc this is a note taking application that provides a friendly interface for instantly noting down information. This will make note taking to android users as easy as storing and accessing contacts. It also provides sharing facilities through e-mail which enhances the capabilities of this application.

The objective is to fulfil the users desire to write quickly and easily on their smart phones, while also being presented with a multitude of styles and options for editing, storing, sharing required information or data. The features included in this application to fulfil the above requirements are:

- A whiteboard implementing touch features of android.
- Wide range of options for the digital ink colours and thickness of pens.
- Enables to save the whiteboard for future reference.
- Facilities to share the notes taken through e-mail in various formats like pdf etc.

A consortium of several companies uses android operating system on smart phones, net-books, tablet computers, Google TV and other devices. The demand

for these devices is increasing as technology develops and android applications play an important role in extending the functionalities of these devices. Aim of this whiteboard application is to develop a hand-writing application for android that allows for a natural writing experience in beautifully designed digital notebooks.

II. LITERATURE SURVEY

The notepad software that generally exists takes only digital text input. Notepad is a common text-only (plain text) editor. The resulting files typically saved with the .txt extension have no format tags or styles, making the program suitable for editing system files that are to be used in a DOS environment. Note shell is the handwriting note taker that features super natural digital ink, a stunning UI and a comprehensive toolset that will increase the benefits of owning an iPad by leaps and bounds. Good application, nice bookshelf like interface and good selection of paper and covers. Also like the feature of the wrist protection, one of the better done features. This application exists for IOS and not android .there are also a lot of other such note taking applications implemented on the IOS platform. This includes Omicron Notes, the interactive notepad that needs no lugging around heavy stacks of paper. One application and many pads, various tools like pens, rulers, protractor, pocket calculator, post-its, etc. Note sharing application, whiteboard this will be a handwriting note taker that features natural digital ink, an easy to work UI and a comprehensive toolset that will increase the benefits of



android users by implementing the following features. A whiteboard implementing touch features of android. Wide range of options for the digital ink colours and thickness of pens that provide the writing experience very close to real-life pen paper. Implement a notebook that will consist of several such pages and also other customizing options like different themes, backgrounds, highlighting, templates will be available. Facilities to share the notes taken through e-mail in various formats.

III. SYSTEM ARCHITECTURE

The high level functionality and responsibility of the system is to provide the user with accurate results for every query received from the user. The partitioning of the functionalities among various system components was quite straight forward.

DFD

High-level design of the project is the DATA FLOW DIAGRAMS (DFD). These diagrams give us the design of our system. These are divided into 3 levels, i.e., Level 0, Level 1 and Level 2. As the level progresses the design gets more detailed and complex. These levels are shown below in order:

Level 0 DFD

The level 0 DFD shows the most basic flow of data through the system.

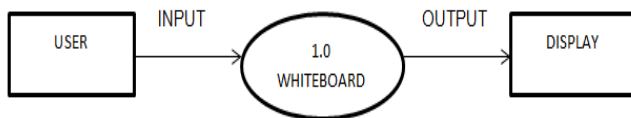


Figure 1: Level 0 DFD

Level 1 DFD

The level 1 DFD represents the more detailed representation of the design of the system. The sub-components of the system such as the input unit, processing unit and the output unit are illustrated. The users in effect interact with these modules. When a user requests or wishes to manipulate the information his request is first validated and then the necessary action is taken by the respective modules with respect to the database.

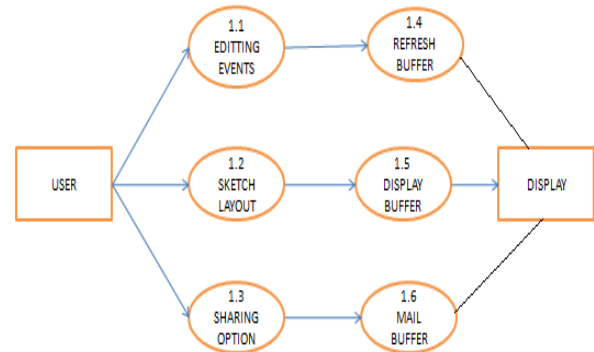


Figure 2: Level 1 DFD

Level 2 DFD

The level 2 DFD represent the most detailed representation. The various operations executed by the application are clearly planned out in the diagram. The system is broken down into more basic modules, which satisfies a specific functionality. The processing unit in the Level 1 DFD is divided into individual units. The processing modules then send their processed outputs to the respective display units, which show the user the output of his application on the device. These modules perform the necessary functionalities of retrieval as well as manipulation of data present.

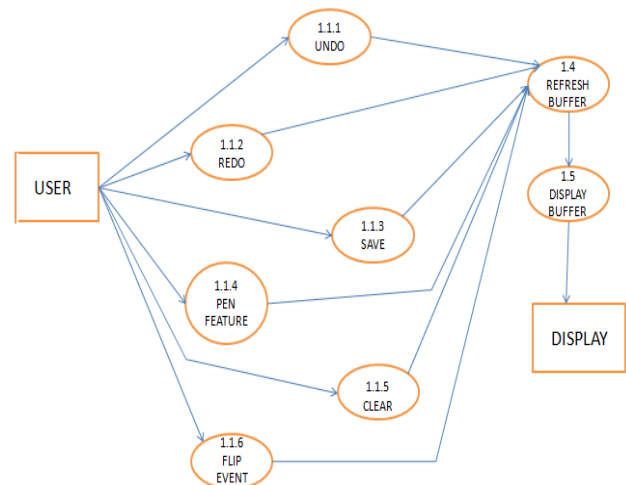


Figure 3 : Level 2 DFD



Structured Chart

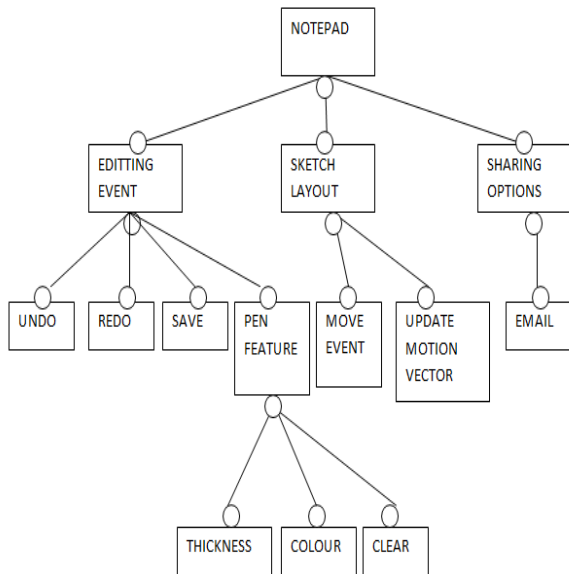


Figure 4: Structure chart

IV. SYSTEM DESIGN

Drawing Path Module

This module implements primarily the functions of the drawing pen used and the drawing path to be displayed is also constructed. Initially the constructor evaluates the input pen type to this function and then calls the required functions. The thin pen function along with various other attributes sets the stroke width to be 2.0, similarly the medium pen function sets the stroke width to be 6.0, and thick pen sets it as 9.0. Eraser sets stroke width to 15.0 and colour to white. The function touch begin point adds the point to the point array and then moves the pen to this position.

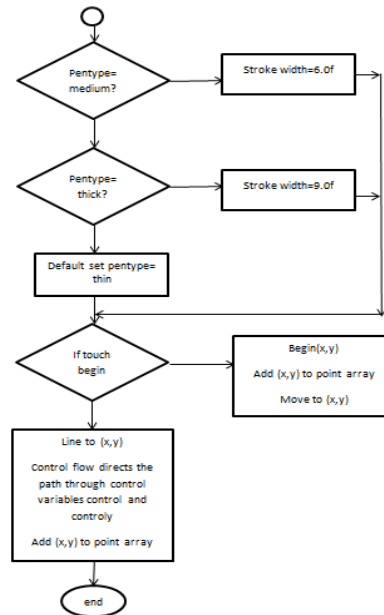
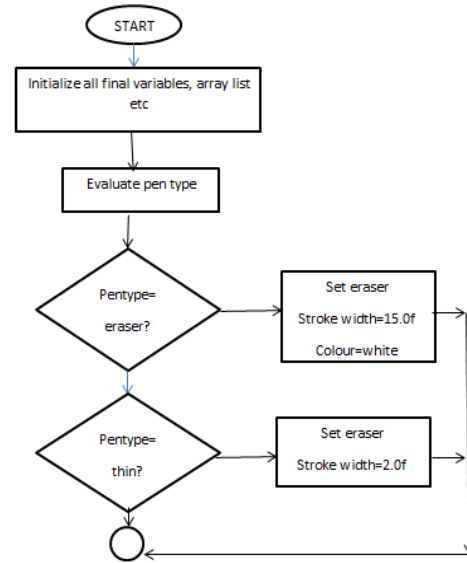


Figure 5: Drawing Path Module

PAPERSHEET MODULE

This module defines all the functions that are required to enable the editing and sharing options of the whiteboard area. It takes care of initializing the scratch area, eraser mode, and secondary storage. This is derived from the activity class whose on create and other required



functions are overridden. Also the menu item that is clicked for required action is evaluated and this makes a call to the required function after the necessary initialization, usually the call is made to the modules in the scratch area module.

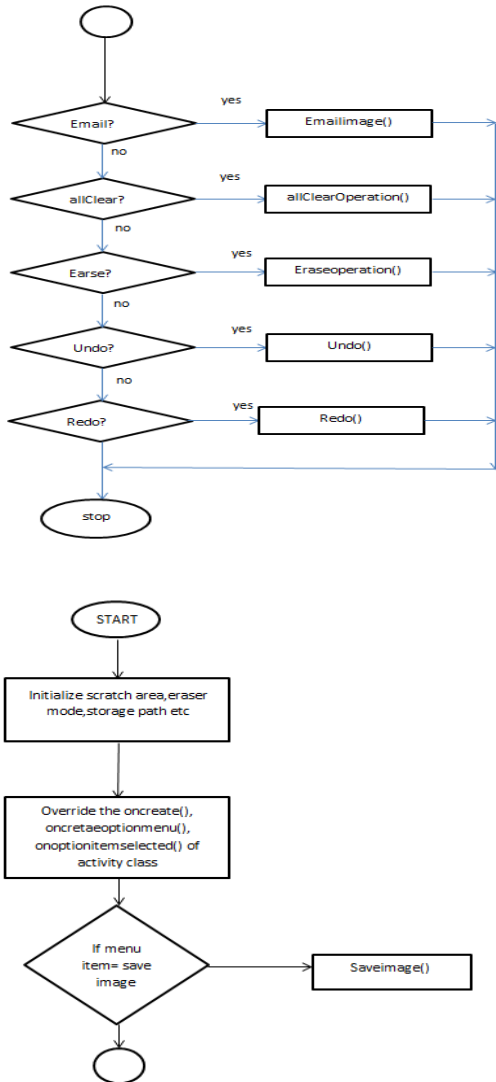


Figure 6: Paper sheet Module

SCRATCH AREA MODULE

This is one of the very important modules that contain the implementation code for most of the functional features of this whiteboard. It also includes setting the white background, initializing the array list, overriding

the ondraw() , ontouch() events. This module includes the implementation of the undo,redo actions along with erase, erase all mode settings.Also the pen type to be chosen and the pen color features required.

SHARING OPTION MODULE

This module basically helps to store the information on the whiteboard and then to use the jpeg or image format to stream the data while sharing.

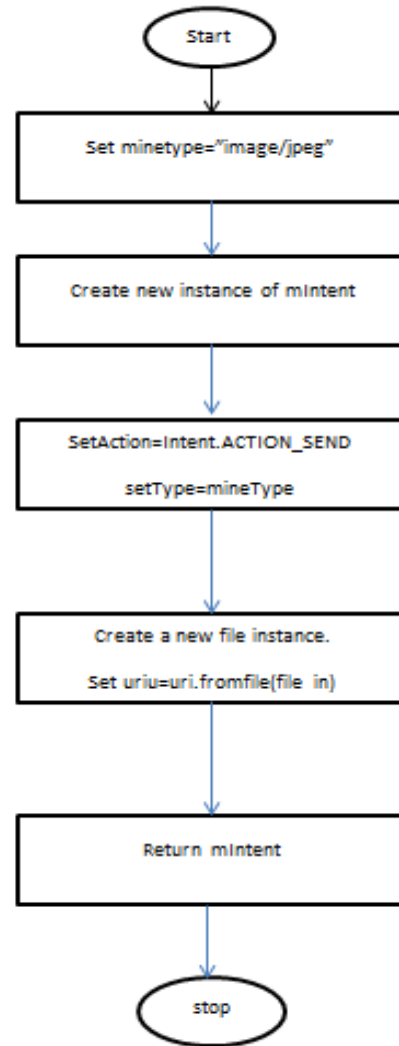


Figure 7: Sharing option



V. EXPERIMENTAL RESULTS

User interface



Figure 8: User Interface

Noting down information

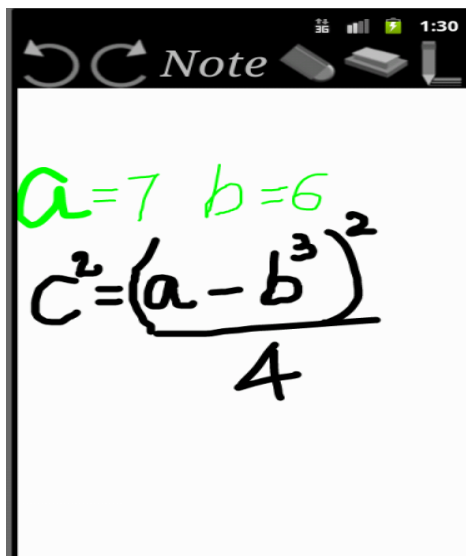


Figure 9: Information

Save as image

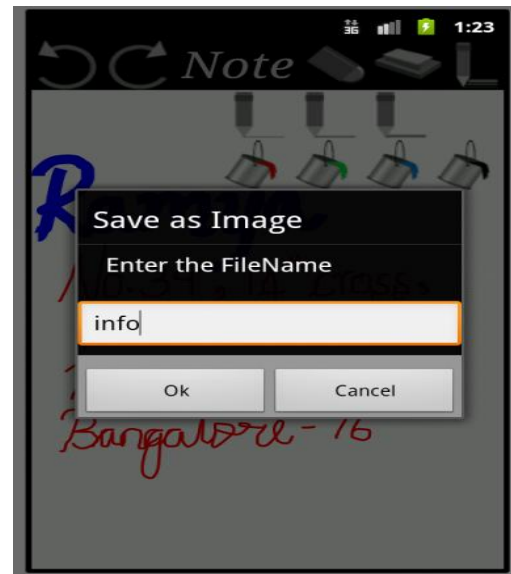


Figure 10 : Save as Image

Sharing options

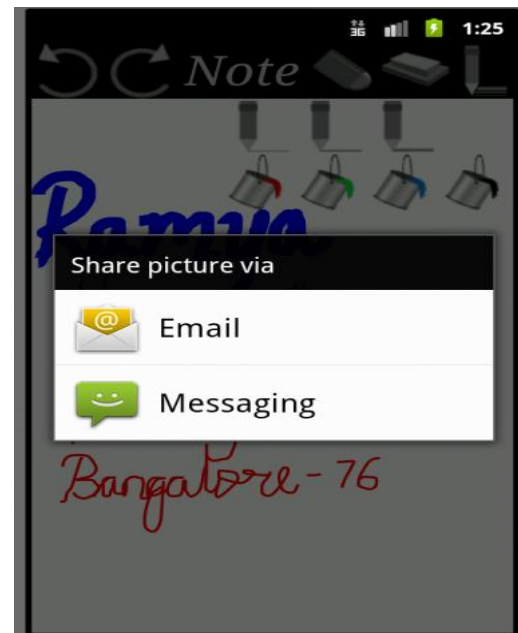


Figure 11 : Sharing Options

VI. CONCLUSION

Android is an operating system for mobile devices such as smart phones and tablet computers. A note sharing application, whiteboard which will be a handwriting note taker that features natural digital ink, an easy to work UI and a comprehensive toolset that will increase the benefits of android users. A whiteboard implementing touch features of android. Wide range of options for the digital ink colours and thickness of pens that provide the writing experience very close to real-life pen paper. Facilities to share the notes taken through e-mail in various formats like jpeg or any other image format etc. The limitations of the whiteboard application are as follows:

- There is no wrist protection on writing.
- There are only 4 basic colours red, blue, green, and black available for use.
- The tool is developed for android platform only. Hence this mandatory requirement for the functioning of this application.

Further enhancements

The whiteboard can be enhanced in a number of ways as mentioned below:

- It can be developed to implement a notebook that will consist of several such pages and also other customizing options like different themes, backgrounds, highlighting, templates will be available.
- To include and edit images in this notebook.

Implementing SIP protocol to allow simultaneous sharing of the same notepad among two android users through their android devices. This will be of great use not only in the business, commercial field but also in the educational sector for better tutoring which will also help improve literacy rate in rural areas.

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REFERENCES

- [1]. G. Zhu and D. Doermann. "Logo Matching for Document Image Retrieval", 10th international conference on document analysis and recognition, p 606-610, 2009.
- [2]. Tariq, J., "α-Soft: An English language OCR", Computer engineering and applications (ICCEA), p 553-557, 2010.
- [3]. Yalniz, I.Z.; Manmatha. R., "A Fast Alignment Scheme for Automatic OCR Evaluation of Books", International Conference Document Analysis and Recognition (ICDAR), 2011.
- [4]. R. Shukla, "Object oriented framework modeling of a Kohonen network based character recognition system", Computer communication and informatics international conference (ICCCI), p 93-100, 2012.
- [5]. Liu, Y., R.H. Weisberg, and C.N.K. Mooers, "Performance evaluation of the Self-Organizing Map for feature extraction". Journal of Geophysical Research, 2006, 111, C05018, doi:10.1029/2005jc003117.
- [6]. T N Shankar, "neural networks", published by university of sciences, 2008, 1st edition.
- [7]. Graves, J. Schmidhuber, "Offline Handwriting Recognition with Multidimensional Recurrent Neural Networks. Advances in Neural Information Processing Systems" 22, NIPS'22, p 545-552, Vancouver, MIT Press, 2009.
- [8]. Jeff Heaton, "Introduction to neural networks in Java", Heaton Research Inc., 2005, 0-9773206-0-X.
- [9]. Raman Maini and himanshu Aggarwal, "A comprehensive review of image enhancement techniques", Journal of computing, volume 2, issue 3, 2010, ISSN 2151-9617.
- [10]. Brijmohan Singh, Mridula, Vivek Chand, Ankush Mittal and D.Ghosh, "A comparative study of different approaches of noise removal for document images", International conference on soft computing for problem solving, volume 130/2102, p 847-854, 2011.
- [11]. Ergina Kavallieratou and Fotis Daskas, "Text line detection and segmentation" Uneven skew angles and kill-and-dale writing", Journal of Universal computer science, Vol 17, p 16-29, 2010.
- [12]. C N Aganthopolous, "A License Plate Recognition algorithm for Intelligent



Transportation System applications". University of the Aegean and National Technical University of Athens, p 377-392, 2006. Archived from the original on 2008-04-20. Retrieved 2012-01-24.

BIOGRAPHY



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