Intelligent Keyboard for Android Text Editor

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Abstract— Now a days, most of the smart phones having touch screen instead of traditional keypad. The virtual keyboard is replaced with traditional keypad. There are various such keyboards that are present in the market including Devanagari language. Devanagari is a script used by many Indian languages like Hindi, Marathi, Nepali and Sanskrit, but typing on such touchscreen is a little difficult for new users. The problems with touchscreen are: - they are highly responsive, touch area is precise, precision is required for typing and users are experiencing many errors in typing keys with their thumb so as a result, typing on such screen is very slow. The solution to these problems is to use an intelligent keyboard. An intelligent keyboard is a virtual keyboard used for touch screen smart phones and tablets where the user enters words by click on one or two letters of the word. the overall objective of this paper is to provide knowledge that can help to improve user experience of Devanagari text entry with an intelligent keyboard in touch screen mobile devices.

Keywords- Smartphone, touch screen, virtual keyboard, Devanagari Script.

I.   INTRODUCTION

Touchscreens are widely used in many devices, like smart phone, tablets, laptops and big interactive white boards. With the popularity of touchscreen devices, finger-operated virtual keyboards are useful. Virtual keyboards also called as on-screen graphical keyboards. These are one of the most useful touch applications, specially where data entry is required and a physical keyboard is not available. The way of typing characters on touchscreen of these smart devices is changing from previous typing method. A typical operational method is used for text input on touch screen devices is using a stylus or a finger. In this method, user has to select a stylus or finger depending on the user's situation and choice. Flexible input operations are possible on touch screen, such as gesture commands, freehand input, and tapping and dragging of on-screen objects. Tapping operation is a click event. Dragging operation is for scrolls and more functions, such as pointing and navigating. On the virtual keyboard, dragging operation enables more accurate targeting to a key.

The virtual keyboard with QWERTY layout is the most widely used layout specially for English language. But the QWERTY keyboard is not efficient keyboard for Devanagari Script. InScript (Indian Script) is the standard keyboard layout for Indian scripts. This keyboard layout was standardized by the Government of India for inputting text in languages   written in Brahmic scripts of India. It was developed by the Indian Government and supported by several public and private organizations. This is the standard keyboard for 12 Indian scripts including   Devanagari, Bengali, Kannada, Malayalam, Oriya, Tamil and others. The InScript layout is built into most of the operating systems including Windows (2000 and later), Linux and Mac OS systems. It is also available in mobile phones and in Apple's iOS 5 and higher.

Devanagari Script

Devanagari script is the most important and widely used script in India. It is a Northern Brahmic script. This script is used by many Indian languages like Hindi, Marathi, Nepali and Sanskrit. Nearly 45% of Indian population doesn't understand English alphabets and most of them are comfortable with Devanagari script. In India there are nearly 41% of native speakers are for Hindi. Also the native speakers of Marathi accounts for 18% of total Indian population [10].

Hindi is normally spoken using a combination of around 52 sounds, 10 vowels, 40 consonants. These sounds are represented in the Devanagari script by 13 characters traditionally regarded as vowels and 40 consonants.

II.   LITERATURE REVIEW

On-screen virtual keyboard can be found in touch screen devices. One trend in Smartphone is to replace physical keyboard with touch screen finger-operated virtual keyboard, which is controlled by tapping instead of key pressing [4].However, users are experiencing difficulties while typing on such touchscreens. Due to small screen it is challenging for user while typing alphanumeric keys with their thumb.
A virtual keyboard is commonly used to type characters into a touch screen-based electronic device. To enter a character, a user must tap a finger on the corresponding software key instead of pressing the hardware key [1].The virtual keyboard with QWERTY layout is the most widely used layout. But this keyboard layout has some usability issues: in mobile devices, with small size of keys on touch screen, user has many difficulties to type characters correctly. To solve these issues many researchers have developed different solutions like, L. Tsurumi has proposed larger split keys on virtual keyboard [6], but as it is two layered typing, it is undesirable for fast typing of characters. Klima [7] proposed a vector keyboard that is composed of three major clusters containing

9 characters, respectively. A user can type characters with their thumb by drawing a vector from one of the clusters. But there still remains a problem.

Drag-and-Type Method

T. Kwon developed a new style of typing called drag-and-type method[9] in which finger touch actions can be divided into two, i.e., tapping and dragging. The first action is a click event, whereas the second action is for scrolls and more functions, such as pointing and navigating. On the virtual keyboard, dragging action enables more accurate targeting to a small key. The user's thumb typing on small touch screen is done as like the hunt and peck typing on real keyboard. On small touch screen if tiny keys are located close to each other, then the dragging action works more accurately than tapping method.

Two types of drag-and-type methods are:

A. *Drag-and-tap*

In this method ,user navigate the virtual keyboard by dragging one finger, and type a highlighted (selected) character by tapping on any blank area with another finger.

B. *Drag-and-drop*

This method makes a user navigate the virtual keyboard by dragging one or two fingers simultaneously, and type a highlighted (selected) character by releasing (dropping) the corresponding finger.

III. PROBLEM FORMULATION

The Drag-and-Type was a typing method based on the dragging actions on a flat touchscreen. Drag-and-type method uses a conventional keyboard. To generate text using a conventional on-screen keyboard, the user presses and releases each key in succession. This method requires more time to type a single word. By using this method user type more slowly on the full-size virtual keyboard than on the existing virtual keyboard and reduces accuracy of the text input. So

there is necessity to find a solution that tries to improve the input accuracy and also increases speed of typing in Devanagari script.

IV. PROPOSED METHODOLOGY

One method to improve accuracy and speed of text input is by using Artificial Intelligence (AI) based intelligent keyboard. The working of AI based keyboard is depending on context of the language. Intelligent keyboard is a unique input method which appears similar to a conventional on-screen keyboard, but functions are different .In this keyboard user presses the first letter of a word with finger or stylus, and then releases that key of letter. It immediately predicts most appropriate word list based on the usage rank. This method uses drag-and-tap technique. Intelligent keyboard uses on-screen virtual keyboard with effective implementation of custom keyboard.

This process works by tracing letter of user typing with the ideal word stored in the dictionary of Devanagari words. Letter is compared with stored words in database, and gives rank to the matched word. By using pattern matching algorithm, most important words are listed and displayed as a result of matching. Also words related to important words are also ranked. Next the matched words are displayed in the list and user has to select word among that list.
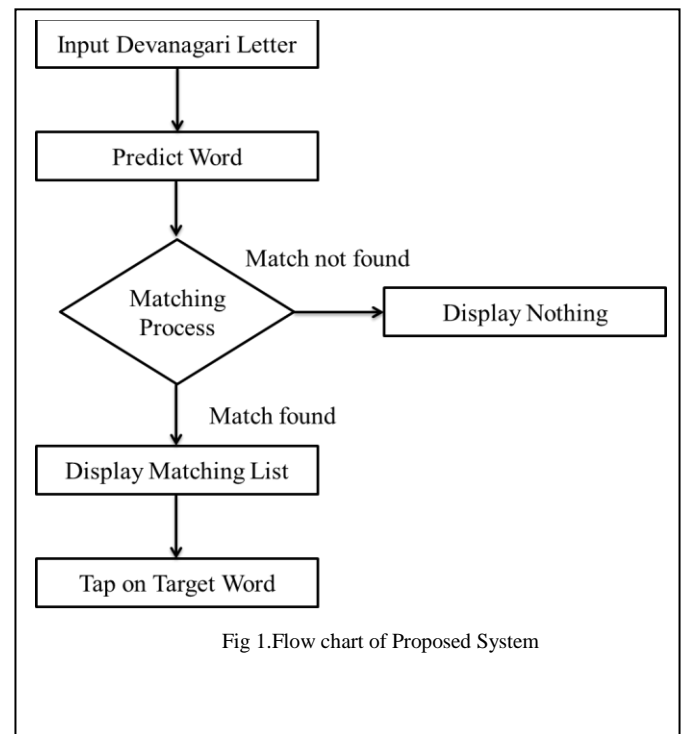

Fig 1.Flow chart of Proposed System

V. EXPEXTED RESULT

1. Speedup the process: The process of typing over alphabets should speedup.

2. Fast Prediction: It should predict the next word before completes over all the alphabets.

3. Rank of the words: Rank of the frequently used words should be first.

4. List of matching words: Matched/related words are displayed in the list which is ranked.

CONCLUSION

The Intelligent Keyboard for Devanagari language is a novel keyboard for typing Hindi words based on the drag and tap actions on a flat touchscreen. The prominent feature of the Intelligent Keyboard for Devanagari script is accuracy. Users are able to type Hindi words more accurately and faster using this keyboard. This keyboard fast predicts words what user is typing with fewer mistakes.

REFERENCES

[1] Taekyoung Kwon; Sarang Na; Sang-ho Park, "Drag-and-type: a new method for typing with virtual keyboards on small touchscreens," *Consumer Electronics, IEEE Transactions on* , vol.60, no.1, pp.99,106, February 2014.

[2] Klima, M., Slovacek, V.: Vector Keyboard for Touch Screen Devices. In: Proc HCII 2009: Ergonomics and Health Aspects of Work with Computers, pp. 250–256. Springer, Heidelberg(2009)

[3] Lai-Man Po; Chi-Kwan Wong; Yiu-Ki Au; Ka-Ho Ng; Ka-Man Wong, "Six-digit stroke-based Chinese input method," *Systems, Man and Cybernetics, 2009. SMC 2009. IEEE International Conference on* , vol., no., pp.818,823, 11-14 Oct. 2009

[4] Katie Boehret, WaltMossberg'sArchive, "Virtual Keyboard Makes Smudges a Must," Accessed 5 Jan 2011,http://solution.allthingsd.com/20100810/swype-virtual-keyboard-review/

[5] B. Martin, P. Isokoski, F. Jayet, T. Schang, "Performance of finger-operated soft keyboard with and without offset zoom on the pressed key," Proceedings of the 6th International Conference on Mobile Technology, Application &Systems,Nice, France, 2009.

[6] K. Go and L. Tsurumi, "Arranging touch screen software keyboard split keys based on contact surface," in Proc. CHI'10 Extended Abstracts on Human Factors in Computing Systems, Atlanta, USA, ACM press, Apr.2010.

[7] M. Klima and V. Slovacek, "Vector keyboard for touch screen devices, "in Proc. International Conference on Ergonomics and Health Aspects of Work with Computers, San Diego, USA, LNCS 5624, pp. 250-256, July 2009.

[8] Hou Xian-feng ; Yan Yu-bao ; Xia Lu "Advanced Computer Theory and Engineering (ICACTE), 2010 3rd International Conference volume: 5 DOI: 10.1109/ICACTE.2010.5579620 Publication Year: 2010

[9] Taekyoung Kwon, Member, IEEE, Sarang Na, Student Member, IEEE, and Sang-ho Park, Non-member, IEEE" Drag-and-Type: A New Method for Typing with Virtual Keyboards on Small Touchscreens" Publication Year: 2014

[10] VaishaliWaghmare, MeenakshiNikoshe, PrajktaBhosle, JyotiUkey, Prof. NilimaJichkar "Hindi / Marathi Text Messenger for Android "IJSET@2014Volume No.3 Issue No.3, pp : 302-305