Project 1 Report

Design of Testing Tool to Study Text Input for Soft Keypads

Vivek Paul Joseph
156330004
Interaction Design
M. Des (2015-17)

IDC School of Design
Indian Institute of Technology Bombay

Approval Sheet

The Interaction Design Project 1 titled “Design of Testing Tool to Study Text Input for Soft Keypads”
by Vivek Paul Joseph, Roll Number 156330004 is approved, in partial fulfillment of the Master in Design Degree in Interaction Design at IDC School of Design, Indian Institute of Technology Bombay

Declaration

I declare that this written document represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Vivek Paul Joseph
156330004

IDC School of Design,
Indian Institute of Technology Bombay

May 2017

Aknowledgements

I would like to thank Prof. Anirudha Joshi for his guidance through the duration of this project.

Table of Contents

Abstract **6**

Introduction **7**

Objectives 7

2. Process **8**

2.1 Secondary Research 8

2.2 Test Design 8

2.3 Scope Definition 9

2.4 Word Selection 10

2.5 Tool Design : Key Touch Collector (KTC) 11

3. Evaluation **13**

Future Scope **14**

Conclusion **15**

References **16**

Abstract

<FIll this In>

Introduction

Smartphone text input methods have been getting augmented by features like adaptive keypads and error correction, which could potentially fix errors that a user makes while typing, thereby improving the overall efficiency of text input. Such methods need to be evaluated for performance before they can be deemed fit for deployment

Objectives

- Design a UT that can be used to record user typing behaviour; that can be used to quantify the performance of (possible future) features (like Adaptive keypad) of the text entry service
- For the scope of this project, Swarachakra Marathi keypad was chosen as the subject

2. Process

2.1 Secondary Research

As part of secondary research, previous research work on the evaluation of text input accuracy was studied. Key features of the existing data collection methods followed for The need and application of the target feature (adaptive keypads) were studied.

2.2 Test Design

The method of testing was defined as a series of pre-set text being shown to the user and the user typing it back into the phone using the particular keyboard. The user's touch pattern is recorded and used to check the performance. It was decided to not show the user the character that they typed in, so that making errors would not affect their typing pattern.

2.3 Scope Definition

In this stage, the different possible features of the evaluation method were charted out; and then the scope of this project was identified (Fig. 1 & 2). The prototype of the evaluation tool would be developed for this set of features.

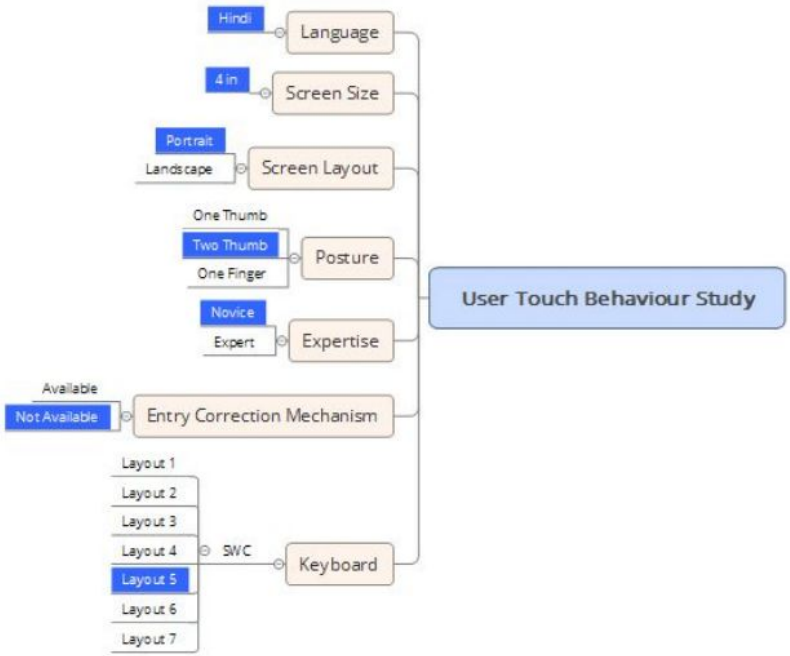

Fig 1. Scope Definition

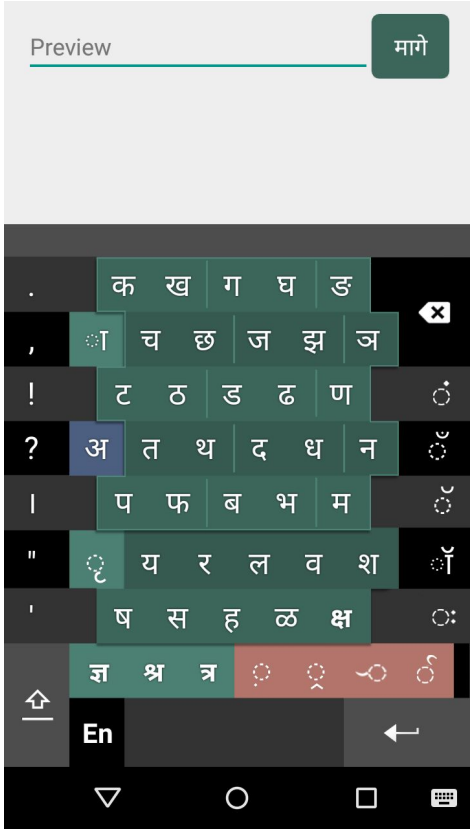

Fig. 2 : Selected Layout

2.4 Word Selection

The words that get fed into the test were selected based on 3 main criteria (of the characters that constitute the screen) :

- Location of key on screen
- Distance of Approach
- Angle of approach

Based on these criteria, a set of words were generated. The generation was done in two steps:

1. Identification of words that met these criteria in a corpus of the most frequent words that are typed by users of the keyboard (globally)
2. Generation of the pending words using an algorithm that was designed and developed for the same (Fig. 3).

The final list of words consisted of bigrams, trigrams and quadragrams.

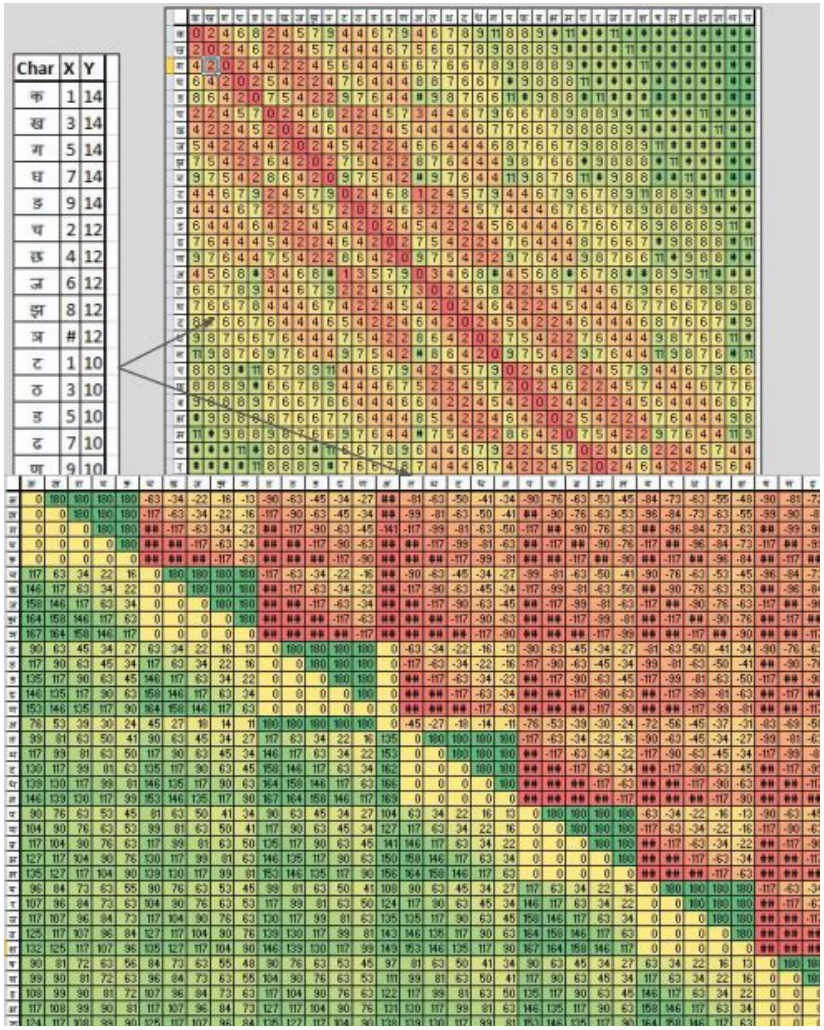

Fig. 3: Word Generation

2.5 Tool Design : Key Touch Collector (KTC)

The actual tool for collecting the data was, then designed, wireframed (Fig 4) and developed for the target test device (Samsung Galaxy DUOS). This tool would present the data to the user, enable the user to input data and log the required parameters from the input data.

An important factor taken into consideration was the data storage format (to ease the data analysis).

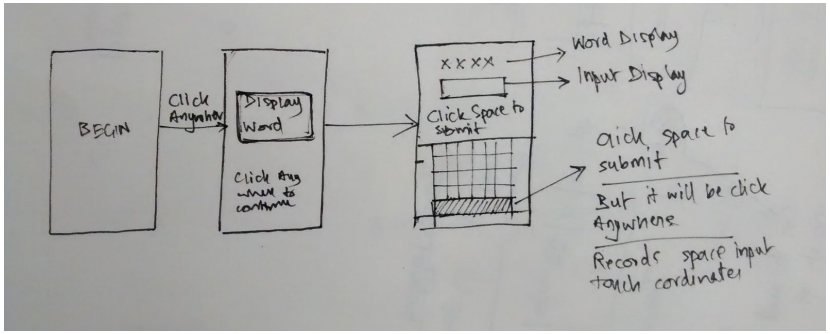

Fig. 4: Tool Design

The testing tool was developed using Android Studio.

3. Pilot Testing

The developed testing tool was used to conduct pilot tests with 4 users and the collected data was analyzed to check for patterns. The data analysis was done using python and the analyzed data was displayed in the form of reports and infographics (Fig. 5).

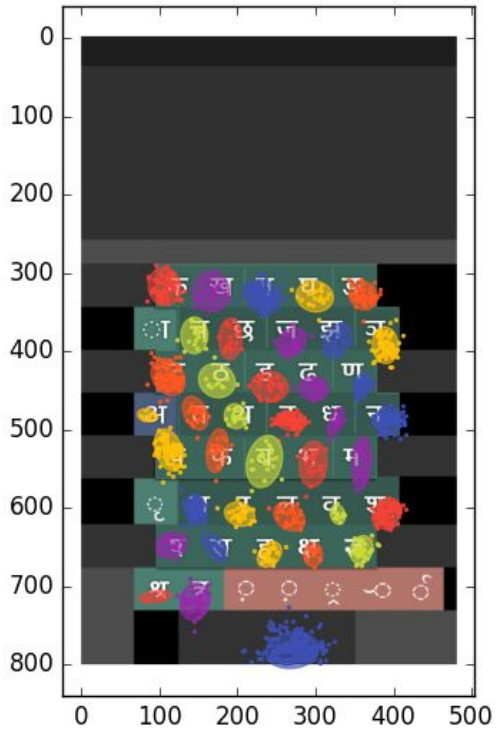

Fig. 5: Analyzed Data

Conclusion

Under this project, a tool was designed and developed to evaluate the performance of features like autocorrect for soft keypads on smartphones. The evaluation framework can be extended to other keypads as well. Further data analysis is required to generate tweaks to improve the keypad features.

References

[1] Shiri Azenkot and Shumin Zhai. 2012. Touch behavior with different postures on soft smartphone keyboards. In Proceedings of the 14th international conference on Human-computer interaction with mobile devices and services (MobileHCI '12). ACM, New York, NY, USA, 251-260. DOI=http://dx.doi.org/10.1145/2371574.2371612

[2] Christian Holz and Patrick Baudisch. 2011. Understanding touch. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (CHI '11). ACM, New York, NY, USA, 2501-2510. DOI: https://doi.org/10.1145/1978942.1979308

[3] Xiaojun Bi, Yang Li, and Shumin Zhai. 2013. FFitts law: modeling finger touch with fitts' law. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (CHI '13). ACM, New York, NY, USA, 1363-1372. DOI: https://doi.org/10.1145/2470654.2466180

[4] Leah Findlater and Jacob Wobbrock. 2012. Personalized input: improving ten-finger touchscreen typing through automatic adaptation. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (CHI '12). ACM, New York, NY, USA, 815-824. DOI: http://dx.doi.org/10.1145/2207676.2208520

[5] Akiyo Kano and Janet C. Read. 2009. Text input error categorisation: solving character level insertion ambiguities using Zero Time analysis. In *Proceedings of the 23rd British HCI Group Annual Conference on People and Computers: Celebrating People and Technology* (BCS-HCI '09). British Computer Society, Swinton, UK, UK, 293-302.