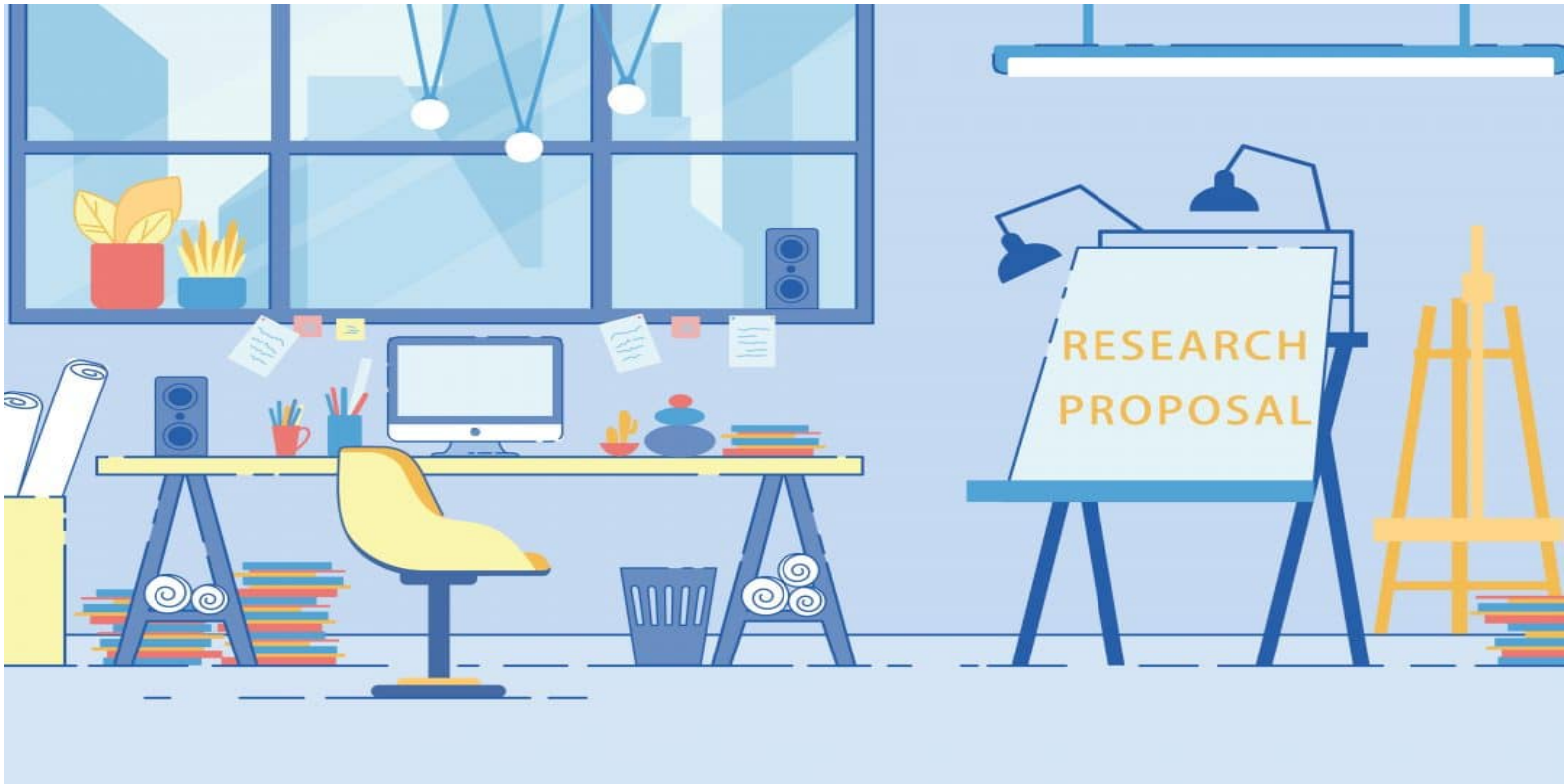
Assignment 2: Research Proposal Presentation

Prepared by:
Mohamed Ahmed Mohamed Elmokhtar Ahmed, 1191102491
Ahmed Hassan Mohammed Salem, 1191102340
Mohammad Wathiq Soualhi, 1191102425
Peravenkumar A L Sivan, 1191102236

Multimedia University

Presentation - Part 1 : Research Proposal



Abstract

Research Problem:

- Users lose interest in using mHealth after a certain period of time

State-of-the-art reseach:

- mHealth has the potential to improve the health lifestyle for individuals by positively affecting health behaviours.
- Not many studies have been conducted to engage the users in the development process of the mHealth application to achieve long-term support and encouragement to continue using the application.

Expected outcome:

- Multi step release process technique develop an improvement towards the mHealth application as it identifies the users needs

Introduction

Mhealth definition:

- mHealth (Mobile Health) can be defined as a public health and medical practice that utilises mobile devices

State-of-the-art research work :

- mHealth applications are considered to be products and just like any other product, the research and study of users and their interaction with mHealth is important to develop a successful mHealth application [Biduski et al., 2020]
- The new mHealth solutions can be seen to substantially depend on the acceptance of users in order to achieve the intended frequent and long-term use of mHealth [Madeira et al., 2018]

Motivation Of The Research

The motives that led us to study factors that helps developers meet user requirement are :

- Users loose interest in using mHealth after using it for a period of time [Biduski et al., 2020]
- Meeting users requirements is a critical factor that determines the success of the mHealth application [Holdener et al., 2020]
- Only few of the studies described how mHealth application developers can engage users in the development process

Research Objectives

The objective of this research is:

- To identify how current mHealth app developers are meeting user requirements
- To identify factors that may affect user acceptance
- To allow developers meet user requirements for the success of mHealth.

Literature Review

- Applications for health care purposes are identified as a growing industry with great potential to improve the health condition for individuals [Santos-Vijande et al., 2022]
- Users tend to show a positive interest in applications that focus on fitness, diabetes and meditations rather than applications that focus on cancers. [Pai and Alathur, 2018]
- The 4 attributes that contribute to user engagement are perceived usability, aesthetic appeal, reward, and focus attention. [Holdener et al., 2020]
- Mhealth applications store sensitive data hence, the healthcare providers must adopt an appropriate transfer protocol as it is an essential factor to convince potential users. [Schwab et al., 2021]

Research Method

- Qualtrics tool was used to identify the required sample size to achieve 99 % confidence level and 4 % error margin
- 1037 candidates from different age groups ranging from 16 to 65 years old were selected
- Each candidate was given a clinic healthcare app to use for 6 months
- Feedback from the users was collected on a monthly basis to study their usage behaviour changes and their intention to continue using the app
- Revuze tool was used to analyse the data.
- The output data was carefully inspected to understand and identify the design features that must be included in mHealth apps to meet user requirements.

Expected Outcome

- Multi-step release process will gather insights related to designing an effective mHealth application based on meeting user requirements.
- This technique will allow the developers to design high-rate performance application, easy handle UI, an efficiency application that cycles in a fast time and well integrated application.
- Multi step release technique will ensure that the application meet user requirements to achieve user acceptance and long term engagement.

References

Biduski, D., Bellei, E. A., Rodriguez, J. P. M., Zaina, L. A. M., and De Marchi, A. C. B. (2020).
Assessing long-term user experience on a mobile health application through an in-app embedded conversation-based questionnaire.
Computers in Human Behavior, 104:106169.

Holdener, M., Gut, A., and Angerer, A. (2020).
Applicability of the user engagement scale to mobile health: A survey-based quantitative study.
JMIR Mhealth Uhealth, 8(1):9.

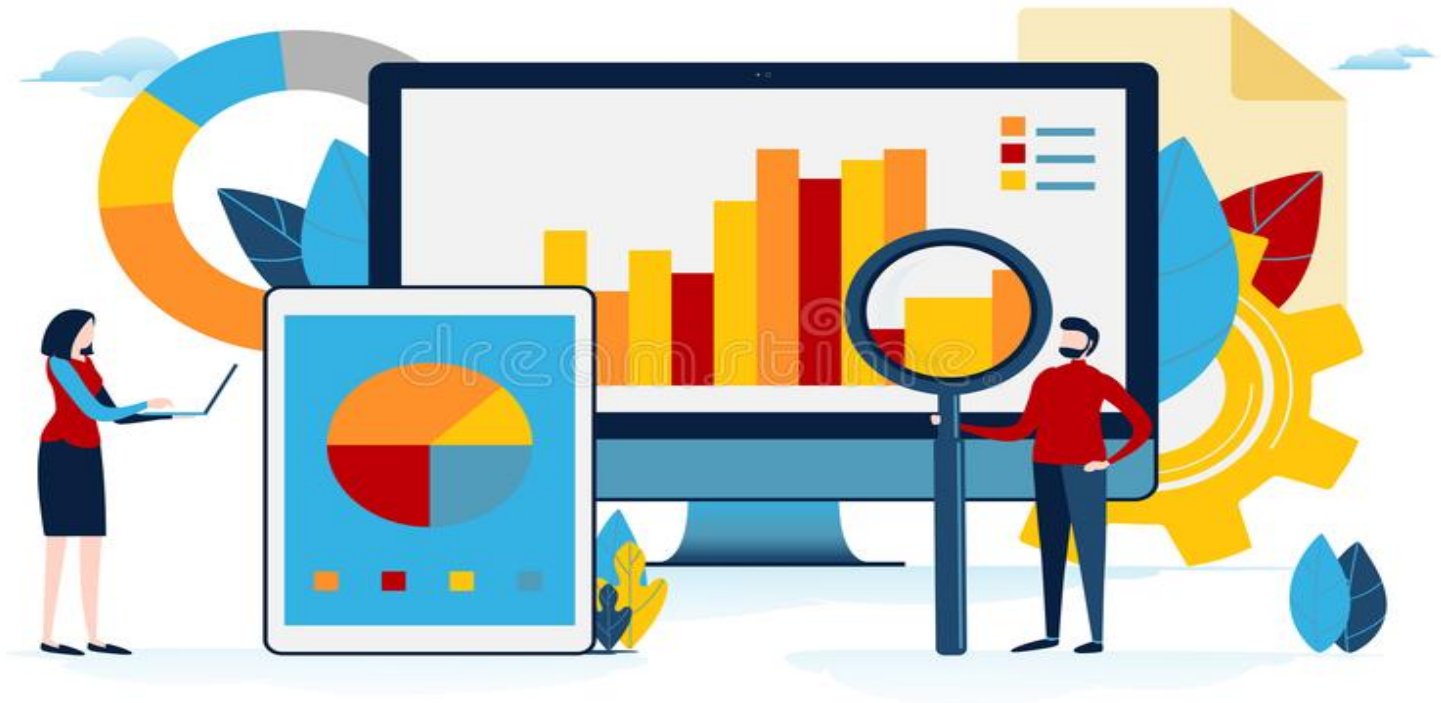
Madeira, R. N., Germano, H., Macedo, P., and Correia, N. (2018).
Personalising the user experience of a mobile health application towards patient engagement.
Procedia Computer Science, 141:428–433.

Pai, R. R. and Alathur, S. (2018).
Assessing mobile health applications with twitter analytics.
International Journal of Medical Informatics, 113:72–84.

Santos-Vijande, M. L., Gómez-Rico, M., Molina-Collado, A., and Davison, R. M. (2022).
Building user engagement to mhealth apps from a learning perspective: Relationships among functional, emotional and social drivers of user value.
Journal of Retailing and Consumer Services, 66:102956.

Schwab, J. D., Schobel, J., Werle, S. D., Fürstberger, A., Ikonomi, N., Szekely, R., Thiam, P., Hühne, R., Jahn, N., Schuler, R., Kuhn, P., Holderried, M., Steger, F., Reichert, M., Kaisers, U. X., Kestler, A. M. R., Seufferlein, T., and Kestler, H. A. (2021).
Perspective on mhealth concepts to ensure users' empowerment–from adverse event tracking for covid-19 vaccinations to oncological treatment.
IEEE Access, 9:13.

Presentation - Part 2: Statistical Data Analysis



Methods Used For Statistical Data Analysis

First of all, we would like to identify methods used in calculating distance between each of the 1000 vaccine-es and all the ppv centers. The methods used are as follows:

- **Vincenty's formulae:** two related iterative methods used in geodesy to calculate the distance between two points on the surface of a spheroid
- **Haversine formula:** determines the great-circle distance between two points on a sphere given their longitudes and latitudes
- **Numpy & DataFrame:** Changing list to numpy and reading data from csv to a dataframe instead of a file reader

Computer used in Execution time Comparison

Specification	Computer 1	Computer 2
RAM	16 GB	4 GB
Hard Disk	1 TB SSD	500 GB SSD
CPU	AMD Ryzen 7 4800 2.9 GHz	Intel Core i5 th Gen GHz

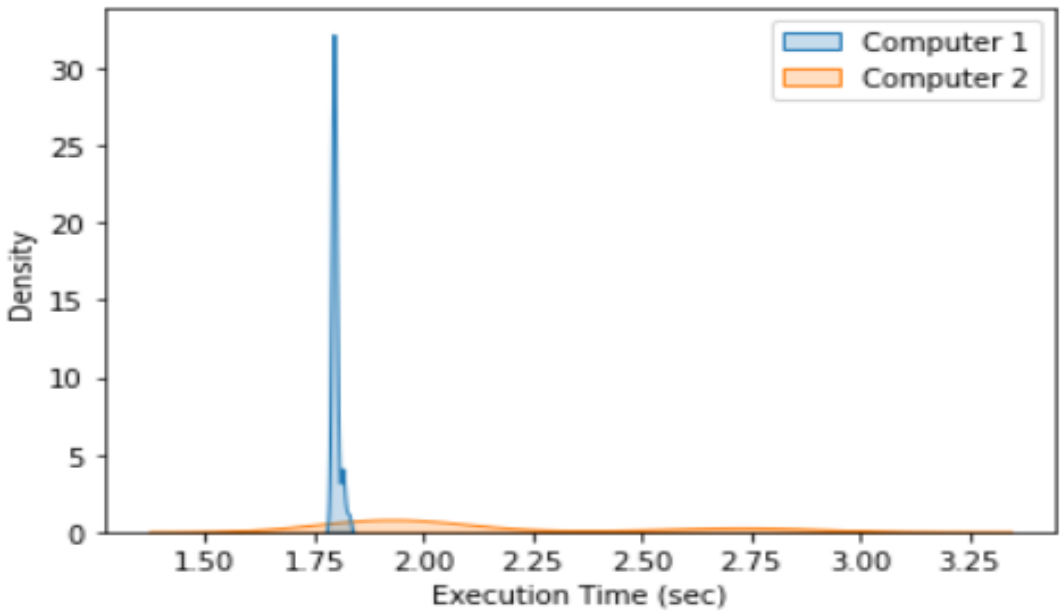
Execution Time Comparison using 2 Computers

The research team ran **Haversine formula** on Computer 1 and Computer 2. The number of times the method was executed is 50 times for each computer. The average run time was then recorded:

Computer	**Average Running Time (Seconds)**
Computer 1	1.796667322
Computer 2	2.152936726

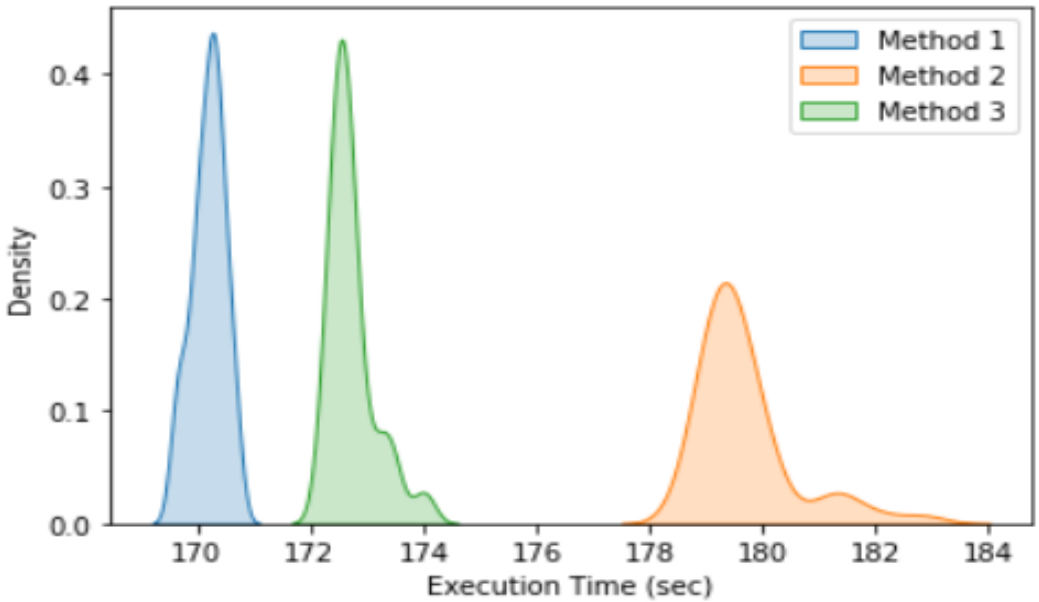
As a result of the experiment conducted, Haversine formula had a faster running time in Computer 1

Shaded density plot to show the distribution difference between Computer 1 and 2 using Haversine formula



Execution Time Comparison for 3 Different Methods

The research team ran the 3 methods on Computer 1. The program ran 50 times for each method. After that, the shaded density plot was used to show the distribution difference:



Acknowledgment

The research team would like to thank Dr Ting for his continuous support in this project. The research team have been working in this project for a long time. Different challenges have been crossed to obtain the intended results which is the reason why this presentation slide is here.