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Ergonomic evaluation and design of a mobile application for maternal and infant health for smartphone users among lower-income class Filipinos

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Abstract

The Philippines has one of the highest birth rate in the world with 24.98 births per 1000 population. For every 1000 of these births, 35 suffer infant mortality. According to the Philippines' National Statistics Office, infant mortality results from lack of sufficient medical care before and after child delivery. An objective of this study was to evaluate an existing mobile application that can help disseminate important pregnancy information among low-income women in the Philippines. Using the ISO 9126 criteria for evaluation, the proponents evaluated the chosen pregnancy application and were able to identify the essential requirements needed by the five pregnant women chosen for the study. The results showed that the application met the users' needs under functionality with three out of five respondents giving a positive remark. Under reliability and usability on the other hand, the positive responses are relatively lower with 40% and 20% positive responses, respectively. Some problems that arose with the application included the users being unable to understand menu icons and options easily and the application being difficult to use for the first time. Another result of the survey showed that frequently asked questions about pre-, during, and post-pregnancy and additional functions like How-To tutorials on breastfeeding and diaper changing were very much needed by the respondents. With the main goal of this study being to design a new informative and comprehensive pregnancy application for Filipino women from low-income backgrounds, the results of the evaluation were critical. The results were used for the foremost purpose of the new application – Uyayi – that is, to provide necessary information about maternal and infant health for smartphone users among lower income class Filipinos while taking into consideration the functionality, reliability, and usability of the application in catering to the target user.

Keywords: Pregnancy; functionality; design; application

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1. Introduction

1.1. Background of the study

In recent years, the number of users of smartphones and tablets around the world has rapidly increased. This trend is ushering a new age in communication and information technology that has made smartphones and tablets an integral part of everyday life, even among developing nations.

In the Philippines, only 17% of the population are smartphone users [1]. However, this number is expected to increase significantly with the accelerating penetration of cheaper smartphone brands among lower- and middle-income class Filipinos. More widespread access to the internet is also expanding smartphone reach into Philippine rural [2].

The capacity of smartphones to carry out multiple functions is bringing in a myriad of applications or apps to deliver virtually all kinds of services – gaming, social networking, education, health, and productivity – to consumers.

The global healthcare industry, in particular, is already recognizing the use of smartphone applications as tools to support decision-making and involvement by patients. However, the use of mobile health or mHealth applications has presented challenges with regards to their accessibility, cost-effectiveness and impact among users, clinicians and policy-makers [3].

In the context of a developing country, one challenge of mHealth is to be able to support the patients who are probably most in need of its use: the low-income class. This is especially critical in countries such as the Philippines where health care is very costly and highly-privatized. One particular field that deserves attention is maternal and infant health.

Thus, this study aims to determine the usability of current pregnancy and infant-related mHealth applications utilized in the Philippines. It will then move on to define design, usability and ergonomics metrics for applications for lower-income class Filipinos in order to establish a framework for a successful design.

1.2. Problem Statement

The lack of a usability and ergonomics framework to guide the design of a mobile health application for Filipino smartphone users is resulting in the failure to deliver critical maternal and infant health information among lower-income class Filipinos.

1.3. Objectives

This study aims to evaluate existing applications regarding pregnancy among low income women in the Philippines by identifying the essential requirements needed by pregnant women. This study also aims to design a new application that could address the most important concerns of pregnancy based on the findings on the evaluation of existing applications.

1.4. Scope and limitations

The study is limited to the expecting and current mothers from a slum area in Quezon City. Five were chosen to take part in the evaluation of the applications based on a previous study done by Nielsen in 2000. Application evaluation was done mainly on an android system to complement with the financial status of the respondents.

The results of the study done by Nielsen in 2000 concluded that the best results can come from testing no more than five subjects. The proponents did not consider the subjects' familiarity in using cellphones, tablets, or iPad applications.

Out of all the existing applications, the proponents decided to evaluate the BabyBump Pregnancy Application created by Alt12 Apps, Inc. because it is one of the best and most popular pregnancy applications of the year according to Tracy Rosecrans at Healthline [4].