

CHAPTER 1

INTRODUCTION

1.1 Project Background

Currently the development of information technology is running very fast, so that to get a person's information, it is enough to access it via a supported device from anywhere and anytime. Computers have the ability to receive data (input), manage data (process) and produce information (output). Information technology has entered almost all aspects of life, for example in information processing which used to be done face-to-face, now this can change with the help of software specifically designed to make it easier for someone to obtain information and support success in increasing user satisfaction achieved.

At now days it is hard to get any simple app to just collect data or even just make a report about health or to be specific pregnant women health, it can make people getting lazy to just get to know what kind of nutrition that they need for their health, it leads to just do whatever that it was right, even can search on internet but not every things on internet was right, sometimes it still need more detail to know about, also making daily reports about pregnant woman is not a common practice in most healthcare settings. Typically, healthcare providers use a combination of periodic check-ups and medical appointments to monitor the health and progress of a pregnant woman. The frequency of these check-ups is determined by the stage of pregnancy, with more frequent visits as the due date approaches.

When talk about making report about the infant or about the pregnancy there is comes some issues like how if the infant had another things to check, here in this project there is another things to check after do some normal pregnancy report, it is called early autism potential detection, Early detection of autism plays an important role in enhancing developmental out comes for affected children. Identifying potential characteristics of the disorder evident during infancy and toddlerhood aids our efforts to screen for such symptoms, which may lead to earlier and more accurate diagnoses(Goin & Myers, 2004)

Early identification of autism, followed by appropriate intervention, has the potential to improve outcomes for autistic individuals(Brewer dkk., 2020). autism, also known as Autism Spectrum Disorder (ASD), is a complex neurodevelopmental

disorder that affects individuals across their lifespan. In some cases there is marked differences between typically developing infants and toddlers and those subsequently diagnosed with autism were evidenced in their social, affective, motor, play, and communication skills(Goin & Myers, 2004). It is characterized by challenges in social interaction, communication, and repetitive behaviours. These challenges can be observed in infancy but become more evident as a child grows, While it can be challenging to diagnose autism in very young infants, a diagnosis is typically made by a team of professionals, including developmental pediatricians, child psychologists, and speech and language therapists. The diagnosis process often involves observing a child's behaviours and developmental milestones over time.

1.2 Problem Statement

Traditional prenatal care and early autism detection methods often lack the continuous and comprehensive data collection necessary to ensure the holistic well-being of expectant mothers and their infants. This research seeks to address these limitations by transforming wearable devices into closed-loop systems capable of enhancing human capabilities. These wearable systems process the collected data to offer instantaneous feedback to users through a diverse range of actuators, including audio and visual cues, olfactory stimulations, electrical impulses, and haptic feedback, some of problem is states as follows :

- a) Difficulty to accurately detect and lack of method for early detecting potential of autism in newborn and in pregnancy.
- b) Difficulty to keep the record on the maternity check up of the maternal infant health care system.
- c) Lack of parental care about autism, especially in newborn and also on their pregnancy.

1.3 Project Objective

The primary objective of this research project is to advance maternal and infant health care by integrating sensing technology and artificial intelligence (AI) into a comprehensive wearable-based system, there is some objective as below :

- a) To utilize AI-driven insights to detect potential indicators of autism spectrum disorder (ASD) in newborns, to enhance medical ability for detecting early potential of autism.

- b) To develop the record keeping on the maternity check up of the maternal infant health care system.
- c) To enhance parental care on early autism potential, ensuring the holistic well-being of expectant mothers and their infants.

1.4 Scope

1.4.1 User Scopes

- a. User can check their newborn or infant health details.
- b. User can provide some information about their pregnancy check.
- c. User can see their pregnancy detection result from the early autism detection.
- d. User can get some tips and healthy life guide about pregnancy,

1.4.2 System Scopes

- a. System can record maternity health check up
- b. System can display the health details about the infant and the parents.
- c. System can automatically detect the infant health regarding the early autism detection depend on data that has been given from the user.
- d. System can generate report from early detection.
- e. System can makes and show the summary about the detection result.
- f. System can display some tips and healthy life guide about pregnancy.

1.5 Project Assumptions And Limitations

1.5.1 Project Assumptions

Integration with wearable medical device: Assumption of pink book app can be able to get some information depend on what kind of device that used, so the app can get some information and then make accurate result based on the data input.

1.5.2 Project Limitations

- a) Budget Constraints: all the medical devices and journal payment access may limit the project budget, impacting the choice of devices and other medical information system.
- b) Integration with wearable device: the implementation of this integration may take much time, and will affect the implementation time.
- c) Knowledge about pregnancy: unfamiliar details and do not know anything about the detail of pregnancy, may affected the research of the project.

- d) Literature source is very limited: about this topic there is very rare to find around the internet, especially about the early autism potential detection in pregnancy.

1.6 Significance

In this project, the significance of this study includes :

- a. A System that able to detect early autism potential in newborn infant.
- b. A System that can integrated with existing medical wearable devices.
- c. A System that can generate a report based on the result.
- d. A System that shows some guide and tips about pregnancy.

1.7 Summary

This research project represents an interdisciplinary endeavour aimed at revolutionizing maternal and infant health care. By leveraging advanced medical existing wearable detection technology, the research seeks to enhance prenatal care and early autism detection, ultimately ensuring the holistic well-being of expectant mothers and their infants. The integration of wearable devices into maternal health care holds the potential to transform the way we monitor and support pregnancies, ultimately leading to improved maternal and infant health outcomes