6COSC023W – Final Project Report

**A group of kids jumping and smiling

Description automatically generated**

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Date

# Document Scope

The purpose of this document is to describe and reflect on the processes that took place in developing the Final Project. Discuss any ethical issues associated with your project and describe the methodology that was adopted to develop its design, implementation and testing.

All chapter word counts in this document are approximate and are not intended to be prescriptive.

*All sections in orange (like this one) must be deleted and removed before submitting the report.*

# Declaration

This report has been prepared based on my own work. Where other published and unpublished source materials have been used, these have been acknowledged in references.

Word Count:

Student Name:

Date of Submission:

*This is an important section!*

*Add the updated word count (do not count words in the Acknowledgments, Table of Contents, Table of Figures, Table of Tables, References, Bibliography and Appendix). Add your name and the date of submission.*

# Abstract

*500 words*

*Summarise here the problem statement and the project aim(s). Provide a brief description of the methodology followed, the main results, your conclusions, and observations.*

Problem Statement

In present-day society, the rapid pace of life combined with demanding work schedules frequently results in a lesser connection between parents and their kids. Notably, parents often endure extensive work hours or face lengthy commutes, considerably reducing the duration and quality of interactions with their children. This reduction in parental engagement can significantly impair both the emotional and cognitive development of children. Mao, Zang, and Zhang (2020) provide a comprehensive analysis of this phenomenon in their study on the effects of parental absence on child development within the Chinese context.

This project was inspired by an initial suggestion from a friend who has recently experienced becoming a father. This friend raised the need for a platform where parents can record messages or bedtime stories for children to play. This would allow his kids, and others like them, to listen to their parents’ voices and hear their stories at any time, even when the parents travel abroad or away from home for extended periods.

Project Objective

The primary goal of this project is to develop "HiKiddo", an innovative mobile application designed to address the issues arising from a physical disconnection between parents and children. The app aims to strengthen familial ties by using modern technological innovations to enhance emotional bonds and support the developmental needs of children through interactive and meaningful engagements.

Principal Outcomes

The "HiKiddo" application is envisioned as a space where family members can collectively participate by adding photos and videos to a shared memory board, creating meaningful voice recordings to be shared, tracking each other's location, and completing the weekly challenges, earning a reward based on points. The project will also involve conducting background research and designing and developing the application using Flutter and Firebase.

This research is designed to comprehensively assess the benefits and challenges associated with developing this project, as well as to evaluate existing tools and platforms that could be utilised. Such a detailed investigation will ensure that the platform is user-friendly, efficient, and easy to navigate. Moreover, the project will include a review phase to reflect on the outcomes and identify potential areas for improvement.

Through this project, I aim to learn the Flutter framework and Dart language, Firebase, and Google Maps Platform and expand my Mobile Full Stack developer skills. By the end of this project, my goal is to deliver a fully operational app that bridges the physical disconnection gap between parents and children, fostering significant interactions and mutual awareness that contribute to family development.

Conclusions and Observations

The "HiKiddo" application is not intended to substitute direct personal interactions but rather to complement them by enhancing familial relationships and supporting pivotal developmental milestones in the lives of children. By concentrating on user-friendly access, emotional bonding, memory conservation, and educational tasks, the application aims to alleviate the adverse effects of parental absence and build family well-being. Ultimately, the "HiKiddo" app endeavours to address the contemporary challenges of familial connectivity by offering a robust platform that aids families in nurturing stronger bonds, irrespective of geographical distances.

# Acknowledgements

*Thank those who helped you build your project and supported you during its development if you wish to hear*.

As I approach the conclusion of my academic journey, I am filled with immense gratitude and a profound sense of achievement. This milestone could not have been reached without the unwavering support and encouragement of many cherished individuals in my life.

First and foremost, I must express my deepest thanks to my fiancée, Catarina Vieira. Her belief in my potential motivated my decision to pursue higher education; without her, I would not have embarked on this incredible journey. Catarina has been my pillar of strength and support throughout these three years, playing a crucial role in shaping the idea behind this project and in the design process of the "HiKiddo" app. Her presence has been a constant source of comfort and motivation. There are no words sufficient to express how grateful I am to have her in my life.

I would also like to extend my sincere gratitude to my supervisor, whose guidance and insights have been crucial. His mentorship has not only helped refine my skills but also enriched my approach to research and development.

Additionally, I owe a great deal of thanks to my colleagues Mohammed Mohammed, Mubashar Khan, and Diogo Sousa. Their constructive feedback, stimulating discussions, and exchange of ideas have significantly contributed to the success of this project.

Each of these individuals has had a profound impact on my personal and professional growth, and I am eternally grateful for their contributions. Thank you for being part of my journey – your support has made all the difference.

# Table of contents

[Document Scope 2](#_Toc159327296)

[Declaration 3](#_Toc159327297)

[Abstract 4](#_Toc159327298)

[Acknowledgements 5](#_Toc159327299)

[Table of contents 6](#_Toc159327300)

[List of figures 7](#_Toc159327301)

[List of tables 8](#_Toc159327302)

[1. Introduction 9](#_Toc159327303)

[1.1 Problem statement 9](#_Toc159327304)

[1.2 Aims and Objectives 9](#_Toc159327305)

[2. Background 10](#_Toc159327306)

[2.1 Literature survey 10](#_Toc159327307)

[2.2 Review of projects / applications 10](#_Toc159327308)

[2.3 Review of tools frameworks and techniques 10](#_Toc159327309)

[3. Legal, social and ethical issues 11](#_Toc159327310)

[4. Methodology 12](#_Toc159327311)

[5. Design 13](#_Toc159327312)

[6. Tools and implementation 14](#_Toc159327313)

[6.1 Tools 14](#_Toc159327314)

[6.2 Implementation 14](#_Toc159327315)

[7. Testing 15](#_Toc159327316)

[7.1 Test coverage 15](#_Toc159327317)

[7.2 Test methodology 15](#_Toc159327318)

[8. Conclusions and reflections 16](#_Toc159327319)

[9. References 17](#_Toc159327320)

[10. Bibliography 18](#_Toc159327321)

[Appendix I 19](#_Toc159327322)

# List of figures

*Provide a list of figures, linking figure numbers to page numbers. If you can, hyperlink the page numbers/figures*.

[Figure 1. Add a caption explaining the image here. 9](#_Toc159486707)

# List of tables

*Provide a list of tables (if any), linking table numbers to page numbers. If you can, hyperlink the page numbers/tables*.

[Table 1. Add caption here. 12](#_Toc159486722)

# 1. Introduction

*Introduce the project, include the problem statement, project aim(s) and objectives*.

## 1.1 Problem statement

*500 words*

*Give some background on the problem you intend to solve and the need for the software/application. Use references to support your statements, when possible, illustrations, diagrams, and figures, if needed*.

In our fast-paced world, the rhythm of life has picked up so much that it often pulls families apart, especially straining the ties between parents and their kids. Today's jobs demand long hours, frequent trips away from home, and sometimes even moving to new places, all of which can cut down on the precious time families spend together. This lack of physical and emotional closeness can really weaken family bonds.

Studies like the one by Mao, Zang, and Zhang (2020) in their paper "The Effects of Parental Absence on Children Development: Evidence from Left-Behind in China" show the tough impacts this separation can have. Their research points out that kids who don't see their parents enough might develop more slowly in terms of their thinking abilities and emotional health. This can lead to worse grades in school and low self-confidence, problems that might follow them into their adult lives and affect their careers and personal relationships.

However, with almost everyone having smartphones and access to the internet these days, we have a big chance to use technology to soften some of these negative effects. The "HiKiddo" app is a creative solution designed to close the emotional distance between parents and their children. It offers a way for family members, even if they're far apart, to connect deeply and meaningfully.

The need for an app like "HiKiddo" becomes obvious when we look at how modern family life is shaped and the pressures that come from today's work demands. By offering a way to keep and boost the emotional ties between parents and children, "HiKiddo" seeks to enhance the well-being of families who are trying to cope with being apart physically.

In conclusion, "HiKiddo" aims to meet a vital need for a technological response to the increasing issue of family disconnection in today's digital world. With its features that encourage people to share more through a common space using photos and video and a weekly challenges task that can be used for educational purposes, the app not only helps in the development of children who may not always be physically close to their parents but also reinforces the family ties crucial for a nurtur emotional environment.

## 1.2 Aims and Objectives

*300 words*

*The aim(s) describe, in a few sentences, the overarching purpose(s)/intention(s) of the software/application. What is the point of developing the software/application, what you wish to achieve?*

*Objectives describe with some detail the individual steps you will take to fulfil the project aim(s)*.

Aim

The primary goal of the "HiKiddo" mobile application is to mitigate the emotional and developmental challenges caused by the physical separation between parents and their children, often a result of modern employment demands. Utilizing advanced mobile technology, the app strives to improve emotional ties within families, ensuring that children feel connected to their parents even when they are not together physically. The ultimate objective is to cultivate stronger family relationships and support the developmental needs of children through engaging digital interactions.

Additionally, I aim to create a simple and enjoyable mobile application that is accessible to users of all ages. With "HiKiddo," parents will be able to foster greater awareness of their children's development and the critical importance of parental connection. The app will include features for recording and saving both images and audio, which will help create lasting memories and reinforce familial bonds.

Objectives

To fulfil this aim, the development of "HiKiddo" will follow several targeted objectives:

**Develop an Intuitive User Interface:** Craft a user-friendly interface that both children and adults can easily navigate. This will include straightforward, accessible pathways to the app's various features, like the voice recording system, the memory board, the task and rewards system, and the location map. The interface will also be designed to be visually attractive to draw in users and promote consistent use.

**Implement voice recording Feature:** Incorporate features such as voice recording and real-time sharing to enable parents to leave voice messages, bedtime stories, and personal notes that children can access at any time. This functionality is designed to bridge the emotional gap that physical distance can create.

**Create a Memory Board:** Build a feature that allows families to upload and securely store photos and videos of any important family memento. This feature will serve as a collective space for family members to relive beloved memories and stay connected to their shared past.

**Establish a Task and Rewards System:** Set up a system where parents can assign tasks to their children, including educational assignments or household duties. Children will earn points for completing these tasks, which can then be traded for rewards. This system aims to create a sense of responsibility and motivate children while also making daily tasks more enjoyable while learning soft life skills.

**Ensure Robust Security and Privacy:** Apply strict, safe coding methods to ensure the safety and privacy of all users. Measures will include secure login processes, encrypted data storage, verifying users' access through the system, making sure they only have access to the information related to their family group, and ensuring that families can use the app with confidence.

**Flutter:** Learn the Flutter framework alongside the Dart programming language.

**Design**: Learn about design apps like Figma or web platforms like Canva to create a mock-up/prototype design.

**Database:** Learn about Firebase and how to connect with the application.

**Location services:** Learn how to work and integrate Google Maps Platform into the app.

Through these specific objectives, "HiKiddo" aims to provide a comprehensive tool that not only enhances emotional well-being and strengthens family ties but also supports the cognitive and social development of children in a fun and interactive way.

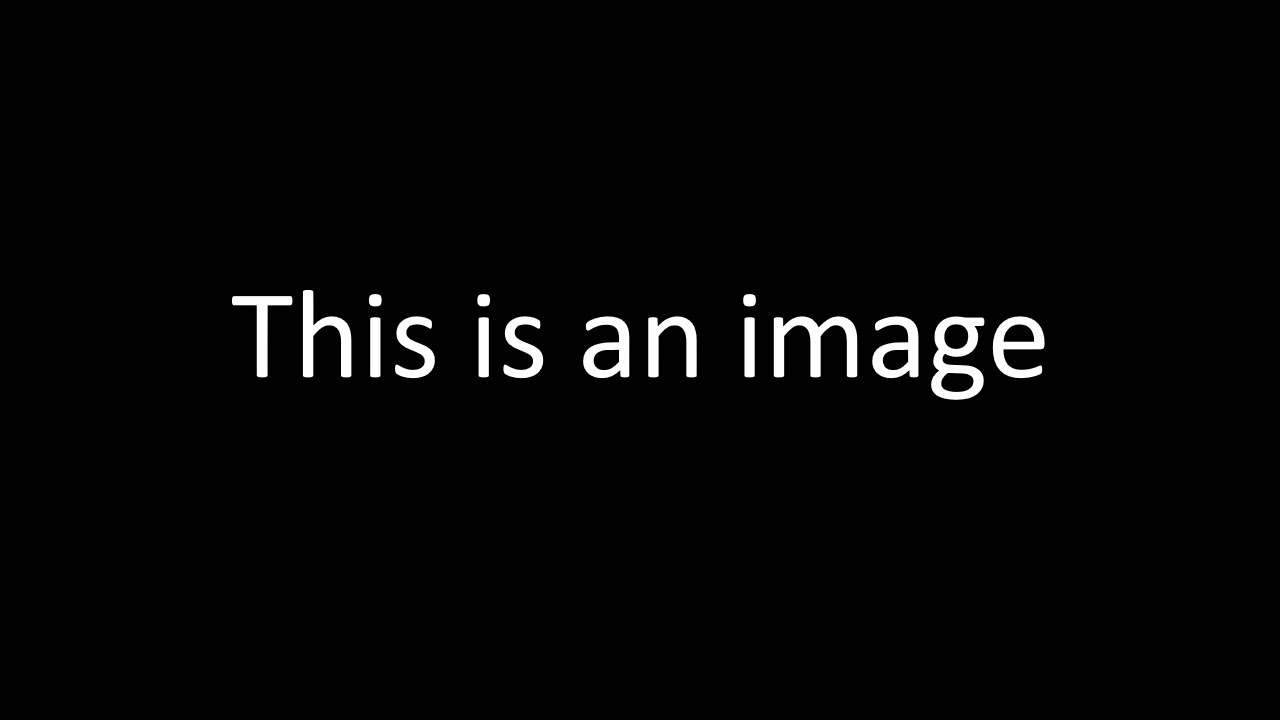


Figure 1. Add a caption explaining the image here.

# 2. Background

*Include a literature survey in the topic, discuss existing similar or relevant applications to yours and the result of a review of tools and techniques that are used to tackle projects similar to yours*.

## 2.1 Literature survey

*800 words*

*Describe initial results of a literature survey on a selected research topic or application area related to your project subject. Use relevant books, published research articles as well as Internet content for the purpose. Make use of in-text references to indicate your sources*.

## 2.2 Review of projects / applications

*800 words*

*Describe your background research on existing projects/software/applications, tools/frameworks/methods/algorithms/techniques relevant to your project, their advantages, and disadvantages. Use illustrations, diagrams, screenshots for the purpose.*

*You may produce a Table of Features in this section, comparing the main features of the above projects/software/applications and the one you developed.*

*A comparison table may also be provided to distinguish the key characteristics of features/methods/algorithms/techniques relevant to your project*.

## 2.3 Review of tools, frameworks and techniques

*800 words*

*Describe results of a survey on relevant tools/frameworks that can be used to develop applications such as the one you built for your project, such as programming languages and environments, libraries. List their advantages and disadvantages. Use illustrations, diagrams, screenshots for the purpose*.

# 3. Legal, social and ethical issues

*300 words*

*Consider any legal, ethical, social, professional and security issues associated with your research and the software/application you are building and/or the data you are collecting/analysing*.

# 4. Methodology

*800 Words*

*Describe the life cycle stages of the project, methodology, and development techniques you followed in the design and implementation of your project.*

*As examples: Gantt chart for life cycle, Waterfall or Agile for development methodology. Use an appropriate methodology for the project and list the key steps and milestones.*

*Discuss the implementation of your project and your consideration for UX, UI. Describe your testing methodology and give adequate examples, e.g., unit testing for typical client-server applications, white box for algorithmic and mission critical code etc. Discuss why your chosen methodology is suitable for the project.*

*Please note that even if you are using Agile methodology, you will still need to provide a high-level waterfall plan with key milestones, with any agile iterations also detailed in this report*.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Category 1 | Category 2 | Category 3 |
| Item 1 |  |  |  |
| Item 2 |  |  |  |
| Item 3 |  |  |  |

Table 1. Add caption here.

# 5. Design

*Describe your final software structure using diagrams where necessary.*

*800 Words*

*Discuss in some detail (if relevant) issues relating to:*

* *User Interface*
* *Infrastructure*
* *Functionality*
* *Algorithm development*
* *Content creation*
* *Other*

*Discuss how these address the project requirements.*

*Use appropriate design methods for your project and extend your design to include implementation details that were not included in your Project Specification Design and Prototype (PSPD) report. e.g. make use of UML such as class diagrams, sequence/activity/state diagrams for complex algorithms and workflows, use UI design methodology and heuristics for predominately UX based projects. If you intend to develop an app/software/dashboard, you may have to use/create ERD, flowcharting, storyboarding, prototyping. It is up to you to use the appropriate design that best describes your implementation*.

# 6. Tools and implementation

## 6.1 Tools

*300 words*

*Describe the tools (programming environments & languages, frameworks, and libraries,) you used for the development of your application. Justify your choices with references to your use cases or list of requirements.*

*State existing skills development and any new skills you employed for building your project*.

## 6.2 Implementation

2500 words

Explain implementation of main code by use case. Include pseudocode or snippets of any novel code. Highlight any code that is adopted/adapted and give the original sources. Make references to your design documentation where appropriate.

# 7. Testing

*Create sufficient test cases to determine that the applications satisfy the requirements and works correctly*.

## 7.1 Test coverage

*800 words*

*Discuss black box and/or white box testing against the requirements. Include specific test cases labelled by the relevant requirements*.

## 7.2 Test methodology

*800 words*

*Describe how the output was tested and why. Discuss how you obtained and used feedback, using expert or/and non-expert users*.

# 8. Conclusions and reflections

*1000 words*

*Provide critical reflections on ALL aspects of the project lifecycle. Include conclusions on the resulting application, research, and findings. Reflect on each aspect of your project life cycle. Critically evaluate how effectively your results meet your stated objectives. Reflect on strengths and weaknesses of your implementation, discuss the acquisition of any new knowledge and skills and consider further work*.

# 9. References

*Include a list of cited in your text items (books, papers, websites, etc.). Use Harvard style for the purpose, or any other preferred standard referencing style*.

# 10. Bibliography

*Include here a list of general reading items (books, papers, websites, etc.). List the items in alphabetical order, using Harvard style to describe them*.

# Appendix I

*Provide additional material, if appropriate, in separate appendices.*

*Use one Appendix to provide a link to an on-line video demo of the project.*

*Do not include the entire code in print as an appendix.*