



**UNIVERSITI TEKNIKAL MALAYSIA MELAKA**

**DEVELOPMENT OF AUDIO SHARING APPLICATION**

**USING ANDROID DEVELOPER**

This report is submitted in accordance with the requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Computer Engineering Technology (Computer Systems) with Honours.

by

**MUFIDA BINTI KHALIZAKI**

**B071510828**

**940321-04-5438**

**FACULTY OF ELECTRICAL AND ELECTRONIC ENGINEERING**

**TECHNOLOGY**

**2019**

**BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA MUDA**

Tajuk: DEVELOPMENT OF AUDIO SHARING APPLICATION USING  
ANDROID DEVELOPER

Sesi Pengajian: 2019

Saya **MUFIDA BINTI KHALIZAKI** mengaku membenarkan Laporan PSM ini disimpan di Perpustakaan Universiti Teknikal Malaysia Melaka (UTeM) dengan syarat-syarat kegunaan seperti berikut:

1. Laporan PSM adalah hak milik Universiti Teknikal Malaysia Melaka dan penulis.
2. Perpustakaan Universiti Teknikal Malaysia Melaka dibenarkan membuat salinan untuk tujuan pengajian sahaja dengan izin penulis.
3. Perpustakaan dibenarkan membuat salinan laporan PSM ini sebagai bahan pertukaran antara institusi pengajian tinggi.
4. \*\*Sila tandakan (X)

☐

SULIT\*

Mengandungi maklumat yang berdarjah keselamatan atau kepentingan Malaysia sebagaimana yang termaktub dalam AKTA RAHSIA RASMI 1972.

☐ TERHAD\*

Mengandungi maklumat TERHAD yang telah ditentukan oleh organisasi/badan di mana penyelidikan dijalankan.

☒ TIDAK  
TERHAD

Yang benar,

Disahkan oleh penyelia:

.....

.....

MUFIDA BINTI KHALIZAKI

AHMAD FAIRUZ BIN MUHAMMAD

AMIN

Alamat Tetap:

Cop Rasmi Penyelia

No 1, Jalan Jati 14, Taman Jati,

Batu Berendam, 75350

Melaka

Tarikh: 4 DECEMBER 2018

Tarikh:

\*Jika Laporan PSM ini SULIT atau TERHAD, sila lampirkan surat daripada pihak berkuasa/organisasi berkenaan dengan menyatakan sekali sebab dan tempoh laporan PSM ini

## **DECLARATION**

I hereby, declared this report entitled DEVELOPMENT OF AUDIO SHARING APPLICATION USING ANDROID DEVELOPER is the results of my own research except as cited in references.

Signature: .....

Author : MUFIDA BINTI KHALIZAKI

Date: 4 DECEMBER 2018

## **APPROVAL**

This report is submitted to the Faculty of Mechanical and Manufacturing Engineering Technology of Universiti Teknikal Malaysia Melaka (UTeM) as a partial fulfilment of the requirements for the degree of Bachelor of Computer Engineering Technology (Computer Systems) with Honours. The member of the supervisory is as follow:

Signature: .....

Supervisor :     **AHMAD FAIRUZ BIN MUHAMMAD**  
                                  **AMIN**

## ABSTRAK

*Inovasi telah menjadi sebahagian dari hidup kita. Pendidikan dengan inovasi adalah kombinasi yang boleh merevolusikan masyarakat kita. Kini, dengan kemajuan teknologi, banyak aplikasi yang telah menggunakan platform android telah muncul dalam pasaran. Penggunaan telefon pintar yang menyediakan servis kepada pembentang dan audien di dalam pembentangan atau majlis di dalam kelas atau dewan boleh menjadi alat yang berkuasa pada pembentang untuk menyampaikan mesej dengan berkesan. Aplikasi telefon pintar yang direka dengan teliti yang menawarkan transmisi audio dari pembentang kepada audien dalam masa nyata untuk meningkatkan pengalaman peribadi kepada audien. Kertas ini membangunkan aplikasi perkongsian audio untuk melaksanakan penyebaran audio dalam cara yang paling efisien dan dipercayai. Pendekatan yang digunakan adalah dengan menggunakan pelayan untuk menghubungkan audien yang menyertai dengan pembentang mereka. Tambahan lagi, aplikasi ini cuba untuk mencipta pengalaman peribadi yang dikongsikan dengan semua audien. Aplikasi yang dibentangkan ini adalah percubaan pertama dalam membangunkan aplikasi telefon pintar yang akan menyokong penyebaran bukan sahaja audio bahkan video dan slaid pembentangan kepada audien. Ini akan menyokong pembentang untuk mencapai pembentangan yang efisien dan pertambahan pengalaman peribadi kepada audien.*

## **ABSTRACT**

Innovation has turned into an essential piece of our life to always make improvement. Teaching with innovation is an effective blend which can alter our general public. Nowadays, with advancement of our technology, many application which utilizes the Android platform has emerged in the market. The utilization of cell phone application contributes utility to the presenter and their audience in a presentation or event at class or hall could be a capable apparatus to the hands of the presenter to disseminate the message in the most effective way. A painstakingly composed cell phone application that offers transmission of audio from presenter to their audience in real-time enhance the personal experience to the audience. This paper develops an audio sharing application that tries to implement dissemination of audio in a trustworthy and efficient way. The approach is to use a server to connect the participating audience with their presenter. Moreover, the application attempts to create a personal experience that shares with the rest of the audience. The presented application is the primary endeavors towards a cell phone system that will support audio, video and slides dissemination to the audience that supports the presenter to accomplish efficiently and an enhanced presentation experience.

## **DEDICATION**

Alhamdulillah, all praise to the Almighty Allah SWT.

To my beloved parents who always there for me.

Sahariah Binti Sulaiman

Khalizaki Bin Hairan

To my siblings.

Muhammad Muizudin Bin Khalizaki

Muafiqah Binti Khalizaki

To my lecturer and supervisor, for their guidance and encouragement.

Encik Ahmad Fairuz Bin Muhammad Amin

To my friends, for everything that they do to help me to complete this final year project.

Kak Ika DC, Muni, Shida, Cath, Ang, Yea, Pijea, Kak Ira, Kak Ina, Ain, Izzati,

and everyone that I'm not able to mention their names here.

Thank you!



## ACKNOWLEDGEMENTS

*Bismillahirrahmaanirrahim,*

*In the name of Allah SWT, the most compassionate and the most merciful.*

Firstly, thanks to Allah SWT because giving me a good health and huge courage and strength to do this final project.

Moreover, I would like to deeply express my gratitude and appreciation to my supervisor, Mr. Ahmad Fairuz Bin Muhammad Amin for his guidance, support, encouragement and helping to finish my final year project.

In addition, I would like to extend my gratitude to all open source community for always creating a solution for technological problems free of charge.

Lastly, my deepest gratitude goes to my beloved mother who is so worried of my health during the final week of submission of final year project report. Also to my father and my siblings for their blessings and prayers.

## **TABLE OF CONTENTS**

	<b>PAGE</b>
<b>TABLE OF CONTENTS</b>	<b>ix</b>
<b>LIST OF TABLES</b>	<b>xiv</b>
<b>LIST OF FIGURES</b>	<b>xv</b>
<b>LIST OF APPENDICES</b>	<b>xviii</b>
<b>LIST OF ABBREVIATIONS</b>	<b>xix</b>
<b>CHAPTER 1      INTRODUCTION</b>	<b>1</b>
1.1      Introduction	1
1.2      Problem Statement	4
1.3      Objective	5
1.4      Project Scope	5
<b>CHAPTER 2      LITERATURE REVIEW</b>	<b>6</b>
2.1      Introduction	6
2.2      Overview of Android Studio Development Environment	6
2.3      Java Language	7
2.4      Overview of Linux	9
2.5      Overview of Music Player Daemon (MPD)	11
2.5.1      Console Clients MPC	12

2.5.2	Graphical Clients GMPC	12
2.6	Router	13
2.7	Web Browser	14
2.8	Related Project Research	15
2.8.1	Design, implementation, and evaluation of the audio/video distribution transport protocol (AVDTP) for high quality audio support over Bluetooth	15
2.8.2	A Comparison Study for File Synchronisation	16
2.8.3	Smart Dissemination and Exploitation Mobile Services for Carnival Events	16
2.8.4	A Novel Interaction Technique to Transferring Files between Smartphones and Public Displays	17
2.8.5	Potential and Limitation of a Tele-teaching Environment Based on H.323 Audio-visual Communication Systems	18
2.8.6	AraBoard: A Multiplatform Alternative and Augmentative Communication Tool	19
2.8.7	“Server-less” Social Network for Enhanced Privacy	20
2.8.8	DevCom: Device Communities for User-friendly and Trustworthy Communication, Sharing, and Collaboration.	20
2.8.9	Kernel Support for Live Digital Audio and Video	21
2.8.10	Performance Measurement on the Heidelberg Audio/Video Distribution System: Methodology and Results	22

2.8.11	Enriching User Experience with Location-Sensitive Music Services	22
2.8.12	Ionian Music Archive: Application of Digitisation, Management, Protection and Dissemination Technologies for Musical Cultural Heritage	23
2.8.13	Supporting the Shared Experience of Spectators through Mobile Group Media	24
2.8.14	Design of Trustworthy Smartphone-based Multimedia Services in Cultural Environment	25
2.8.15	The Role of Spatial Contextual Factors in Mobile Personalization at Large Sports Events	25
2.9	Comparison	26
2.10	Summary	34
<b>CHAPTER 3</b>	<b>METHODOLOGY</b>	<b>35</b>
3.1	Introduction	35
3.2	Project Overview	35
3.2.1	Project Flowchart	36
3.3	Hardware Implementation	39
3.3.1	Android Devices	40
3.3.2	Router	40
3.3.3	Linux Ubuntu Operating System	41

3.3.4	Music Player Daemon Server	42
3.3.5	Gnome Music Player Client	43
3.4	Software Implementation	44
3.4.1	Android Studio	45
3.4.2	Android Application Use Case Diagram	46
3.4.3	Creating Android Application	46
3.5	Summary	50
<b>CHAPTER 4</b>	<b>RESULTS AND DISCUSSION</b>	<b>51</b>
4.1	Introduction	51
4.2	Project Implementation in Android Operation	51
4.3	Project Analysis	54
4.3.1	Application Testing	54
4.3.2	Survey Analysis	59
4.4	Summary	65
<b>CHAPTER 5</b>	<b>CONCLUSION AND FUTUREWORK</b>	<b>66</b>
5.1	Introduction	66
5.2	Conclusion	66
5.3	Recommendation	67
5.4	Project Potential	67

**REFERENCES      69**

**APPENDIX        72**

## LIST OF TABLES

TABLE	TITLE	PAGE
Table 2.1:	Table of Comparison between Related Project Researches	26
Table 3.1:	Table of Device Model and the Characteristics	40
Table 4.1:	Table of the Supported Devices Based on Their Android Name	55
Table 4.2:	Test Case of Installation	56
Table 4.3:	Test Case of Launching Time	56
Table 4.4:	Test Case of Connecting with Server	57
Table 4.5:	Test Case of Controlling the Server	57
Table 4.6:	Test Case of Streaming	58
Table 4.7:	Test Case of the Rate of Synchronization of the Stream between Devices	58

## LIST OF FIGURES

FIGURE	TITLE	PAGE
Figure 1.1:	Bar chart of Desktop vs Mobile vs Tablet Market Share in Malaysia from April 2017 - April 2018	2
Figure 1.2:	Bar chart of Mobile Operating System Market Share in Malaysia from April 2017 - April 2018	3
Figure 2.1:	Android Studio Logo	7
Figure 2.2:	Overview of Android Studio	8
Figure 2.3:	The Android Emulator	9
Figure 2.4:	Gnome Music Player Client software interface	13
Figure 2.5:	Router Device	14
Figure 2.6:	Bluetooth piconet testbed with one Bluetooth master and three Bluetooth slaves.	15
Figure 2.7:	System Architecture	17
Figure 2.8:	System Architecture	18
Figure 2.9:	Components of a teleteaching environment	19
Figure 2.10:	AraBoard Architecture	20
Figure 2.11:	DevCom Architecture	21
Figure 2.12:	Conference Origination Application	22



Figure 2.13: Figure of place, user annotations and music all work actively together in constructing location-sensitive experiences	23
Figure 2.14: General multi-layered architecture	24
Figure 2.15: System Architecture	25
Figure 2.16: Relationship of use of context and mobile personalization	26
Figure 3.1: Developer Workflow	36
Figure 3.2: Flowchart of the Megaphone Application	37
Figure 3.3: Flowchart of the Navigation Drawer Activity	38
Figure 3.4: Hardware Architecture	39
Figure 3.5: The Router Setup	41
Figure 3.6: The Linux Version	41
Figure 3.7: The configuration file of mpd.conf	43
Figure 3.8: The Gnome Music Player Client Software Version	44
Figure 3.9: Network Architecture of MPD Server	45
Figure 3.10: The Android Studio IDE Version	45
Figure 3.11: Use Case of Megaphone Application	46
Figure 3.12: Coding Snippet of the Dependencies	47
Figure 3.13: Coding Snippet of the Import Class	47
Figure 3.14: Coding Snippet of the MainActivity	48
Figure 3.15: Coding Snippet of the onCreate Method	48
Figure 3.16: Coding Snippet of the AlertDialog Declaration	49

Figure 3.17: Coding Snippet of the setPositiveButton	49
Figure 3.18: Coding Snippet of the string.xml	49
Figure 3.19: Coding Snippet of information_settings.xml	50
Figure 4.1: Screenshot of the Megaphone App	52
Figure 4.2: Screenshot of the Megaphone App	52
Figure 4.3: Screenshot of the Megaphone App	53
Figure 4.4: Screenshot of the Streamer Devices	53
Figure 4.5: Android Studio API Version Distribution	54
Figure 4.6: The Pie Chart of the Profession of the Respondents	60
Figure 4.7: The Bar Chart of the Educational Institution the Respondents From	60
Figure 4.8: The Bar Chart of the Regularity of the Phone Usage of the Respondents	61
Figure 4.9: The Pie Chart of whether the Student Bring Their Phones to Class or Not	61
Figure 4.10: The Pie Chart of the Availability of Public Wi-Fi at the Respondent Work Place	62
Figure 4.11: The Pie Chart of the Regularity of Usage of Speakers During Teaching	62
Figure 4.12: The Pie Chart of the Usage of Speaker's from Phone during Teaching	63
Figure 4.13: The Pie Chart of the Clarity of the Sound	63
Figure 4.14: The Bar Chart of the Respondents Feedback	64

## **LIST OF APPENDICES**

<b>APPENDIX</b>	<b>TITLE</b>	<b>PAGE</b>
	Appendix A Configuration of MPD Server	73
	Appendix B Megaphone Application Android Studio Coding	82

## **LIST OF ABBREVIATIONS**

<b>PC</b>	Personal Computer
<b>IDE</b>	Integrated Development Environment
<b>ADT</b>	Android Development Tools
<b>JVM</b>	Java Virtual Machine
<b>GUI</b>	Graphical User Interface
<b>CLI</b>	Command Line Interface
<b>MPD</b>	Music Player Daemon
<b>GMPC</b>	Gnome Music Player Client
<b>ISP</b>	Internet Service Provider
<b>HTTP</b>	Hyper Text Transfer Protocol
<b>PAN</b>	Personal Area Network
<b>PD</b>	Public Display
<b>UX</b>	User Experience
<b>UI</b>	User Interface
<b>APK</b>	Android Package
<b>OS</b>	Operating System
<b>IP</b>	Internet Protocol
<b>TCP</b>	Transmission Control Protocol
<b>URL</b>	Uniform Resource Locator
<b>API</b>	Application Programming Interface

## **CHAPTER 1**

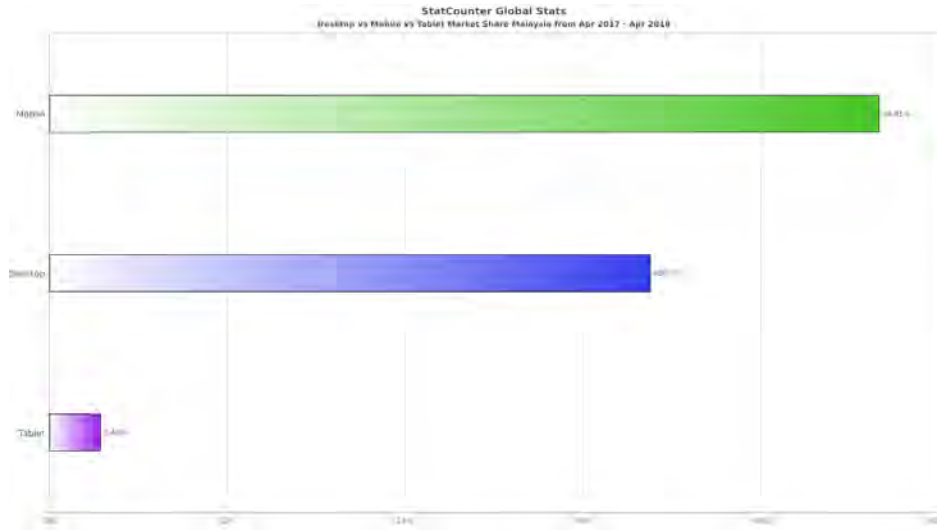
### **INTRODUCTION**

#### **1.1 Introduction**

This part explains the general viewpoint of research where it focuses on the development of Android apps to transmit audio between Android smartphone devices. This section gives brief clarification about the project which covers the background, problem statement, goal and scope of the project. This clarification depicted the thought and idea of the project and how it will be applied in the real circumstance.

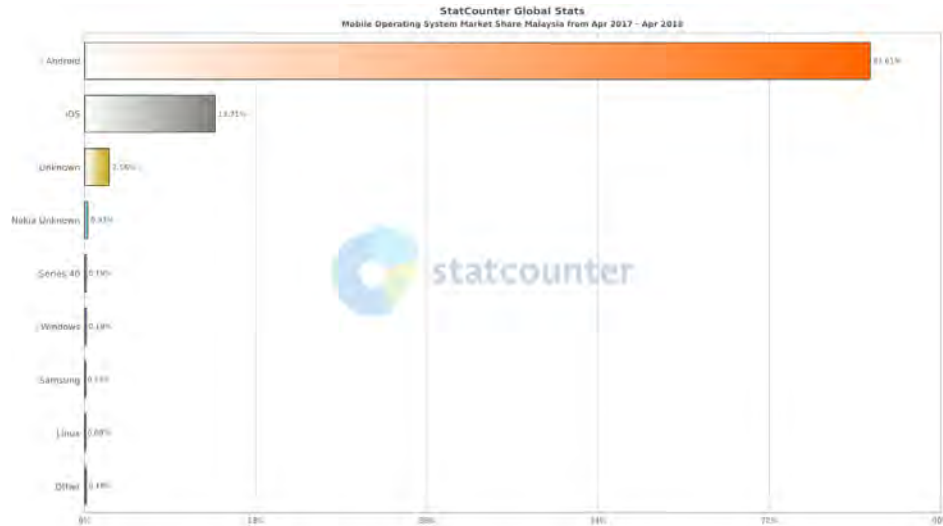
These days, with the advancement of data innovation, people tend to carry their cell phone wherever they go, as it has apparently become very important in their everyday activities. Figure 1.1 shows a Desktop vs Mobile vs Tablet market share in Malaysia by StatCounter from April 2017 until April 2018. It stated that cell phones surpass desktop by 56.01%. While desktop market share is 40.53% and tablet market share lags behind by 3.46%.

The stats rely upon total information gathered by StatCounter on a sample surpassing 10billion site visit for each month, accumulated from over the StatCounter system of more than 2 million sites. Stats are updated and made accessible every day, however, are liable to quality affirmation testing & modification for 45 days from distribution. The individual sample size in Malaysia is 172 million. While the sample size of the cell phone in Malaysia is 77 million.



**Figure 1.1: Bar chart of Desktop vs Mobile vs Tablet Market Share in Malaysia  
from April 2017 - April 2018**

When looking at cell phones market share by their operating system in figure 1.2. Android penetration is highest which is 82.61%. While IOS only 13.71% and the rest totalled up 3.68%. Making Android operating system nearly ubiquitous among these segments.



**Figure 1.2: Bar chart of Mobile Operating System Market Share in Malaysia from April 2017 - April 2018**

The utilization of cell phones for basic day to day computing tasks is exceptionally preferred by the general dominant society (who owns a cell phone) as they have numerous points of interest over a Personal Computer (PC) or laptop. Portability is a noteworthy one. With cell phones, users can perform relatively every errand that they could do with their laptop or workstation. The current technology in smartphones enables users to transfer various data which includes an image, video, and sound to anyone.

By using Android in cell phones as a platform to develop the audio sharing apps, it is expected that it will provide a low cost and user-friendly application to users. This project will focus on the capabilities of Android in cell phones to share audio between smartphone devices.

## 1.2 Problem Statement

Modernization has push such a tremendous extent in the previous decade or two that it has made lives more adept and comfortable. The amenity of having the holding power to hold domination of smartphones audio in distinction to other smartphone device has become imperative as it saves a lot of time and effort. Hence surface a demand to do so in an organized approach to implement this system. Alongside the advancement and breakthroughs in modernization over the years, the lives of people have turned out to be further convoluted and hence they have become busier than before. With the adoption of this system, to gain authority over the audio system of participating smartphone devices from another smartphone device.

The problem scenario is during presentation or lectures in a large hall or class, the presenter or lecturer wants the audience to listen to audio on their mobile phone. But the audience at the end of the hall or class cannot hear it. So it would become problematic especially when there are no speakers available. Another scenario is during listening exam in a hall where there's no speakers available. It would be troublesome for the teacher to make sure that the student at the back of the hall to hear the sound at the front of the hall.

Therefore, such mobile application needs to be developed in order for the presenter to convey the message clearly to the audience. This development will ultimately help a presenter to transmit audio from their server to their audience smartphones when there is lacking speakers so that all the audience can hear the audio even if they are at the end of the hall.