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**DEVELOPMENT OF A MOBILE AUGMENTED
REALITY APPLICATION TO ENHANCE YOUTH
ENGAGEMENT IN DESIGNING PUBLIC SPACES**

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DECLARATION

I declare that this is my work and this thesis/dissertation does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any other University or Institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgment is made in the text. I retain the right to use this content in whole or part in future works (such as articles or books).

Signature:

Date: 14.04.2025

The above candidate has carried out research for the PhD/MPhil/Master's thesis/dissertation under my supervision. I confirm that the declaration made above by the student is true and correct.

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ABSTRACT

Public spaces play a crucial role in shaping the quality of urban life. However, these spaces are often designed by professionals with minimal community involvement in the design process. Even when engagement occurs, traditional methods such as hand drawings, manual mapping, or public discussions limit the general public's ability to visualize and effectively communicate their ideas. This study examines the application of Mobile Augmented Reality as a means to enhance public, specifically youth, involvement in designing public spaces, thereby addressing the existing gap. This research aims to develop and test CityBuildAR, a mobile AR application that enables users to visualize and design public spaces through their smartphones. The methodology comprised a) A systematic literature review, b) A review of existing AR applications in urban design, and c) the development of CityBuildAR using Unity Real-Time Development Platform for Android devices, followed by d) app demonstrations and validation with user groups. Participants were divided into three categories: professionals, university students, and the general public based on their spatial design knowledge: limited, transitional, and professional. The open cafeteria (Sentra Court) at the University of Moratuwa, Sri Lanka, was selected as the study site. The study findings revealed that: (a) Mobile Augmented Reality is an effective way to engage people with limited knowledge in public space design to express their design thinking, (b) Compared to professionals, the general public wanted to have more green elements in the public space; (c) Even though M-AR has the potential to enhance community engagement in designing public spaces, it cannot replace the conventional approaches completely. The study demonstrates the potential of AR in democratizing urban design processes and recommends its integration into future public engagement initiatives. By bridging the gap between professionals and the general public, tools like CityBuildAR offer a novel pathway toward inclusive and participatory urban development.

Keywords: Mobile Augmented Reality, Public Participation, Youth Engagement, Public Spaces, Urban Planning

TABLE OF CONTENTS

Declaration	1
Acknowledgment	2
Abstract	3
Table of Contents	4
List of Figures	6
List of Tables.....	8
List of Abbreviations.....	9
Chapter 1	10
Introduction	10
1.1 Background of Study	10
1.1.1 Public Participation in Urban Planning.....	10
1.1.2 Traditional Participatory Planning Approaches	11
1.1.3 Community Engagement in Designing Public Spaces.....	12
1.1.4 Augmented Reality (AR)	13
1.1.5 Mobile-Augmented Reality (M-AR)	15
1.2. Problem Statement	17
1.3. Research Gap	18
1.4. Objectives of Study	19
1.5. Research Questions	20
Chapter 2	21
methodology.....	21
2.1 Overall Methodology of the Study.....	21
2.2 Background Literature Review	22
2.3 Systematic Literature Review.....	22
2.4 Development of M-AR Application	24
2.4.1. Target Group	24
2.4.2. Software	25
2.4.3. Application Features	25
2.4.4. Application Production	26

2.4.5. Testing the Application	27
2.4.6 Validating the Application	33
Chapter 3	35
results and discussion	35
3.1 Systematic Literature Review	35
3.2. Development of Application	46
3.3. Testing of the application with the target group.....	49
3.4 Validation with Target Group - Youth.....	63
Chapter 4	66
conclusion	66
4.1 Leveraging M-AR to create an inclusive and accessible platform for community engagement in urban planning	66
4.2 Challenges and barriers in implementing M-AR as a tool to design public spaces in urban planning.....	67
4.3 To What Extent Does the CityBuildAR App Bridge the Gap between Professionals and the General Public in Designing Public Spaces?	69
4.4 Can M-AR Tools Like CityBuildAR Replace Traditional Participatory Planning Tools?.....	71
4.5 Scope and Limitations.....	73
4.6 Recommendations for future studies	75
4.6.1 Practical Implications.....	75
4.6.2 Technical Constraints.....	75
4.6.3 Recommendations for future researchers.....	76
References	78

LIST OF FIGURES

Figure	Description	Page
Figure 1.1	Research Gap	19
Figure 2.1	Overall Methodology	21
Figure 2.2	PRISMA Flow Diagram	23
Figure 2.3	Public Space Elements Used in Application	25
Figure 2.4	Unity 3D Interface	26
Figure 2.5	Location of the Study – Sentra Court, UOM	27
Figure 2.6	Invitation through Facebook	28
Figure 2.7	Designing using SketchUp Modelling and Hand sketching	29
Figure 2.8	Users engaging in designing using the CityBuildAR app	32
Figure 2.9	Introductory session & users engaging in designing using the CityBuildAR app	33
Figure 3.1	App Sequence Diagram	44
Figure 3.2	App Prototype Development	44
Figure 3.3	Mobile Application Interface	45
Figure 3.4	Adding design elements	46
Figure 3.5	Remove element	47
Figure 3.6	Participants' Profile	48
Figure 3.7	Positive aspects of using hand sketching for designing —university students	50
Figure 3.8	Challenges of using hand sketching for designing —university students	50
Figure 3.9	Positive aspects of using 3D modelling —university students	51

Figure 3.10	Challenges of using 3D modelling—University Students	51
Figure 3.11	Challenges of using hand sketching for designing —general public	51
Figure 3.12	Challenges of using existing tools for designing —professionals.	52
Figure 3.13	Positive aspects of using AR—University Students	52
Figure 3.14	Challenges of using AR—University Students	53
Figure 3.15	Positive aspects of using AR—General Public	53
Figure 3.16	Motivations for using AR—professionals	54
Figure 3.17	Exemplary visualizations completed using CityBuildAR by Professionals	55
Figure 3.18	Exemplary visualizations completed using CityBuildAR by Undergraduates	56
Figure 3.19	Exemplary visualizations completed using CityBuildAR by General Public	56
Figure 3.20	Word Cloud representing participant opinions	61
Figure 3.21	Positives experienced while using the AR app for designing - Validation	62
Figure 3.22	Challenges experienced while using the AR app for designing - Validation	62
Figure 3.23	Designs created for UOM front area using CityBuildAR	63

LIST OF TABLES

Table	Description	Page
Table 2.1	Overview of the Feedback Form	30-31
Table 3.1	Overview of 33 AR applications	38-41
Table 3.2	Image analysis	57

LIST OF ABBREVIATIONS

Abbreviation	Description
AR	Augmented Reality
M-AR	Mobile Augmented Reality
URA	Urban Redevelopment Authority
VR	Virtual Reality
GPS	Global Positioning System
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
BSB	Backward Snowballing
FSB	Forward Snowballing
UI	User Interface
HCI	Human Computer Interactions
GIS	Geographic Information Systems
UDA	Urban Development Authority