

**USER ENGAGEMENT ANALYSIS OF INTERACTIVE  
BIRDWATCHING SIGNAGE AT LEMBUR MANGROVE  
PATIKANG**



**PRO-STEP RESEARCH AND TECHNOLOGY REPORT**

**Elicia Valerina**

**00000078320**

**VISUAL COMMUNICATION DESIGN STUDY PROGRAM  
FACULTY OF ART AND DESIGN  
UNIVERSITAS MULTIMEDIA NUSANTARA  
TANGERANG  
2025**

**USER ENGAGEMENT ANALYSIS OF INTERACTIVE  
BIRDWATCHING SIGNAGE AT LEMBUR MANGROVE  
PATIKANG**



**PRO-STEP RESEARCH AND TECHNOLOGY REPORT**

Proposed to Fulfill the MBKM Course

**Elicia Valerina**

**00000078320**

**VISUAL COMMUNICATION DESIGN STUDY PROGRAM  
FACULTY OF ART AND DESIGN  
UNIVERSITAS MULTIMEDIA NUSANTARA  
TANGERANG**

**2025**

**i**

User Engagement Analysis..., Elicia Valerina, Universitas Multimedia Nusantara

## NO PLAGIARISM STATEMENT

I hereby,

Full Name : Elicia Valerina

Student ID : 00000078320

Study Program : Visual Communication Design

state that the PRO-STEP Research & Technology Report titled:

**USER ENGAGEMENT ANALYSIS OF INTERACTIVE BIRDWATCHING  
SIGNAGE AT LEMBUR MANGROVE PATIKANG**

is the result of my own work. It is not plagiarism nor written by anyone else, and all quoted and referenced sources have been correctly stated and included in the Bibliography.

Should it be proven that there is fraud / irregularities in my paper, both related to the MBKM process or report writing, I am willing to accept the consequence of being declared NOT PASS for the MBKM Course that I have taken. I will also bear all legal consequences against me and will not involve Universitas Multimedia Nusantara, regarding the act of plagiarism.

Tangerang, 12<sup>th</sup> of December 2025



(Elicia Valerina)

## STATEMENT PAGE ON THE USE OF ARTIFICIAL INTELLIGENCE (AI) ASSISTANCE

I, undersigned:

Full name : Elicia Valerina

Student ID (NIM) : 00000078320

Study Program : Desain Komunikasi Visual

PRO-STEP Report Title : User Engagement Analysis of Interactive Birdwatching Signage at Lembur Mangrove Patikang

hereby honestly declare the use of Artificial Intelligence (AI) assistance in completing this project as follows:

- ☐ Using AI as permitted to assist in generating main ideas only
- ☐ Using AI as permitted to assist in generating the first draft of the text only
- ☒ Using AI to refine syntax and grammar for assignment submission
- ☐ Because it is not permitted: Did not use AI assistance in any way in the creation of the assignment

I also declare that:

- (1) I have fully and honestly submitted the details of AI tool usage required for the assignment through the Artificial Intelligence (AI) Tool Usage Form
- (2) I acknowledge that I have used AI assistance in my assignment, whether in the form of words, paraphrasing, or the inclusion of important ideas or facts suggested by AI, and I have included them in the citations and references.
- (3) Notwithstanding the above statement, this assignment is entirely my own work.

Tangerang, 12<sup>th</sup> of December 2025



(Elicia Valerina)

## ENDORSEMENT PAGE

PRO-STEP Research and Technology Report titled:  
**USER ENGAGEMENT ANALYSIS OF INTERACTIVE  
BIRDPWATCHING SIGNAGE AT LEMBUR MANGROVE PATIKANG**

By  
Full Name : Elicia Valerina  
Student ID : 00000078320  
Study Program : Visual Communication Design  
Faculty : Art and Design

Has been tested on Friday, December 12<sup>th</sup> 2025  
from 16.30 to 17.00, and was stated

PASSED

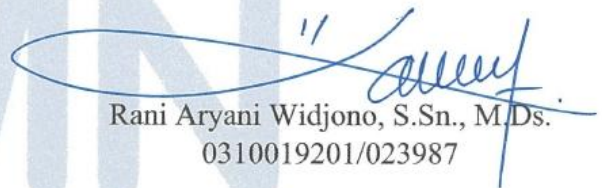
with the order of examiners as follows:

Mentor



Fonita Theresa Yoliando, S.Ds., M.A.  
0311099302/043487

Reviewer



Rani Aryani Widjono, S.Sn., M.Ds.  
0310019201/023987

Head of Visual Communication Design Study Program



Fonita Theresa Yoliando, S.Ds., M.A.  
0311099302/043487

## APPROVAL OF PUBLICATION

I hereby,

Full Name : Elicia Valerina  
Student ID : 00000078320  
Study Program : Visual Communication Design  
Faculty : Arts & Design  
Type of Work : PRO-STEP Research & Technology Report

I hereby declare that I am willing to:

- ☐ Grant full permission to Universitas Multimedia Nusantara to publish my scientific work in the Knowledge Center repository, so that it may be accessed by the Academic Community/Public. I declare that my work does not contain any confidential data, and I will not revoke the permission I have given for any reason.

I am not willing, due to the following reason:

- ☒ The work is currently in the process of being submitted for publication in a national/international journal or conference (proven with a letter of acceptance)\*\*.

Tangerang, 12<sup>th</sup> of December 2025

UNIVERSITAS  
MULTIMEDIA  
NUSANTARA



(Elicia Valerina)

## PREFACE

First and foremost, I would like to express sincere gratitude to God Almighty, for His grace and blessings that have enabled the completion of this report entitled “User Engagement Analysis of Interactive Birdwatching Signage at Lembur Mangrove Patikang.”

I also wish to extend heartfelt appreciation to all parties who have contributed to the execution of this research and provided encouragement and support throughout the completion of this report.

I would like to thank,

1. Dr. Andrey Andoko, as the Rector of Universitas Multimedia Nusantara.
2. Muhammad Cahya Mulya Daulay, S.Sn., M.Ds., as the Dean of the Faculty of Universitas Multimedia Nusantara.
3. Fonita Theresia Yoliando, S.Ds., M.A., as the Head of the Study Program of Universitas Multimedia Nusantara.
4. Fonita Theresia Yoliando, S.Ds., M.A., as the first Advisor who has provided guidance, direction, and motivation for the completion of this report.
5. Andy Firmansyah, S.IKom., M.M., as the Supervisor who has provided guidance, direction, and motivation for the completion of this report.
6. My family who has provided material and moral support, so that I can complete this thesis.

Hopefully this report contributes as a source of information and inspiration for others.

Tangerang, 12<sup>th</sup> of December 2025



(Elicia Valerina)

# **ANALISIS *USER ENGAGEMENT* PADA SIGNAGE INTERAKTIF BIRDWATCHING DI LEMBUR MANGROVE PATIKANG**

(Elicia Valerina)

## ***ABSTRAK***

*Ekowisata mangrove di Indonesia memiliki potensi yang signifikan untuk dimanfaatkan sebagai sarana edutourism (edukasi-pariwisata). Lembur Mangrove Patikang merupakan salah satu lokasi yang memiliki potensi kuat untuk berkembang menjadi destinasi edutourism yang lebih interaktif, dan saat ini tengah menjalani proses revitalisasi untuk mendukung pengembangan tersebut. Penelitian ini bertujuan untuk merancang dan mengevaluasi efektivitas media interaktif berupa signage birdwatching, dalam meningkatkan keterlibatan pengguna serta pengalaman edukatif dalam konteks ekowisata hutan mangrove. Dengan menggunakan kerangka Human-Centered Design (HCD), proyek ini melalui tahapan Inspiration, Ideation, dan Implementation. Tingkat keterlibatan pengguna diukur menggunakan User Engagement Scale–Short Form (UES-SF), yang dilengkapi dengan pertanyaan non-UES untuk memperoleh wawasan lebih jauh mengenai kualitas konten, aspek visual, kemudahan penggunaan media, serta saran pengguna terhadap desain. Hasil penelitian menunjukkan bahwa media buku panduan birdwatching yang dirancang memperoleh skor user engagement yang tinggi yaitu 4,4 dari 5, yang menjadi indikasi bahwa media tersebut dapat dikategorikan efektif dalam meningkatkan pengalaman edukatif dan keterlibatan pengunjung dalam lingkungan ekowisata mangrove.*

***Kata kunci:*** *Edutourism, Signage Birdwatching, User Engagement*

# **USER ENGAGEMENT ANALYSIS OF INTERACTIVE BIRDWATCHING SIGNAGE AT LEMBUR MANGROVE PATIKANG**

(Elicia Valerina)

## **ABSTRACT (English)**

Mangrove ecotourism in Indonesia holds a significant potential as an educational medium. Lembur Mangrove Patikang is one such site with strong potential for becoming a more engaging edutourism destination and is currently undergoing revitalization to support this development. This research aims to produce and evaluate the effectiveness of interactive birdwatching signage in enhancing user engagement and educational experiences within the mangrove ecotourism context. Adopting the Human-Centered Design (HCD) framework, the project progressed through stages of inspiration, ideation, and implementation. User Engagement was measured using the User Engagement Scale–Short Form (UES-SF), complemented by additional non-UES questions to get insights on content quality, visual appeal, usability, and design suggestions. Results show that the birdwatching guidebook achieved a high overall engagement score of 4.4 out of 5, indicating the effectiveness of the media on enhancing visitors educational experience and engagement within the mangrove ecotourism environment.

**Keywords:** Edutourism, Birdwatching Signage, User Engagement

U N I V E R S I T A S  
M U L T I M E D I A  
N U S A N T A R A

## TABLE OF CONTENT

|                                                                               |      |
|-------------------------------------------------------------------------------|------|
| NO PLAGIARISM STATEMENT .....                                                 | ii   |
| STATEMENT PAGE ON THE USE OF ARTIFICIAL INTELLIGENCE (AI)<br>ASSISTANCE ..... | iii  |
| ENDORSEMENT PAGE .....                                                        | iv   |
| APPROVAL OF PUBLICATION.....                                                  | v    |
| PREFACE.....                                                                  | vi   |
| <i>ABSTRAK</i> .....                                                          | vii  |
| ABSTRACT (English) .....                                                      | viii |
| TABLE OF CONTENT.....                                                         | ix   |
| LIST OF TABLES .....                                                          | xi   |
| LIST OF PICTURES.....                                                         | xii  |
| LIST OF APPENDICES .....                                                      | xiii |
| CHAPTER I PREFACE.....                                                        | 1    |
| 1.1 Research Background.....                                                  | 1    |
| 1.2 Problem Formulation .....                                                 | 3    |
| 1.3 Research Limitations and Scope.....                                       | 3    |
| 1.4 Research Purpose.....                                                     | 5    |
| 1.5 Research Urgency .....                                                    | 5    |
| 1.6 Research Outputs.....                                                     | 5    |
| 1.7 Research Benefits .....                                                   | 6    |
| 1.8 Research Timeline.....                                                    | 7    |
| CHAPTER II LITERATURE REVIEW .....                                            | 9    |
| 2.1 Ecotourism.....                                                           | 9    |
| 2.1.1 The Purpose and Criteria of Ecotourism .....                            | 9    |
| 2.1.2 Mangrove Ecotourism.....                                                | 10   |
| 2.2 User Engagement .....                                                     | 10   |
| 2.2.1 Dimensions of User Engagement.....                                      | 11   |
| 2.2.2 Measurement of User Engagement.....                                     | 12   |
| 2.3 Lembang Mangrove Patikang.....                                            | 12   |
| 2.3.1 Faunal Diversity.....                                                   | 13   |

|                                                     |              |
|-----------------------------------------------------|--------------|
| 2.3.2 Mangrove.....                                 | 14           |
| <b>CHAPTER III RESEARCH METHODS.....</b>            | <b>15</b>    |
| 3.1 Research Method .....                           | 15           |
| 3.2 Research Stages .....                           | 16           |
| 3.2.1 Inspiration .....                             | 17           |
| 3.2.2 Ideation.....                                 | 18           |
| 3.2.3 Implementation.....                           | 19           |
| 3.3 Data Collection Technique .....                 | 20           |
| 3.3.1 Inspiration .....                             | 20           |
| 3.3.2 Ideation.....                                 | 22           |
| 3.3.3 Implementation.....                           | 23           |
| 3.4 Data Analysis Technique.....                    | 24           |
| <b>CHAPTER IV RESULT AND DISCUSSION .....</b>       | <b>29</b>    |
| 4.1 Research Timeline.....                          | 29           |
| 4.2 Research Result.....                            | 31           |
| 4.2.1 Inspiration .....                             | 31           |
| 4.2.2 Ideation.....                                 | 34           |
| 4.2.3 Implementation.....                           | 39           |
| 4.3 Data Analysis and Discussion .....              | 45           |
| <b>CHAPTER V CONCLUSION AND RECOMMENDATION.....</b> | <b>47</b>    |
| 5.1 Conclusion .....                                | 47           |
| 5.2 Recommendation.....                             | 48           |
| <b>REFERENCE .....</b>                              | <b>xiii</b>  |
| <b>ATTACHMENT .....</b>                             | <b>xviii</b> |

UNIVERSITAS  
MULTIMEDIA  
NUSANTARA

## LIST OF TABLES

|                                                                                 |    |
|---------------------------------------------------------------------------------|----|
| Tabel 1.1 Timeline of PRO-STEP Research and Technology Program.....             | 7  |
| Table 2.1 Dimensions of User Engagement.....                                    | 11 |
| Table 3.1 Scales and Measurement of UES-SF.....                                 | 25 |
| Table 4.1 Research Activities Timeline.....                                     | 29 |
| Table 4.2 UES Table Score, Questionnaire November 12 <sup>th</sup> 2025.....    | 42 |
| Table 4.3 UES Subscale Score, Questionnaire November 12 <sup>th</sup> 2025..... | 43 |



## LIST OF PICTURES

|                                                                                |    |
|--------------------------------------------------------------------------------|----|
| Picture 2.1 Location of Lembur Mangrove Patikang, Citeureup.....               | 13 |
| Picture 3.1 Research Outline.....                                              | 15 |
| Picture 3.2 HCD Framework Flow.....                                            | 16 |
| Picture 4.1 Focus Group Discussion Activity Documentation.....                 | 33 |
| Picture 4.2 Guided Tour Through the Mangrove Forest of Lembur Mangrove.....    | 34 |
| Picture 4.3 Discussion and Designing Process.....                              | 36 |
| Picture 4.4 Lembur Mangrove Patikang Map Design (Signage 1).....               | 37 |
| Picture 4.5 Birdwatching Guidebook Design (Signage 2).....                     | 37 |
| Picture 4.6 Contents of the Birdwatching Guidebook.....                        | 38 |
| Picture 4.7 Meeting and Discussion with PT Chandra Asri (October 2nd 2025).... | 39 |
| Picture 4.8 Pitching and Explanation to Participants.....                      | 40 |
| Picture 4.9 Participants Using the Media While Filling in Questionnaire.....   | 41 |



## LIST OF APPENDICES

|                                                             |        |
|-------------------------------------------------------------|--------|
| Appendices A MBKM Cover Letter - MBKM 01 .....              | xviii  |
| Appendices B MBKM Card - MBKM 02.....                       | xix    |
| Appendices C MBKM Daily Tasks - MBKM 03 .....               | xx     |
| Appendices D MBKM Report Verification Sheet - MBKM 04 ..... | xxxii  |
| Appendices E MBKM Acceptance Letter (LoA) .....             | xxxiii |
| Appendices F MBKM Completion Letter (LoC).....              | xxxiv  |
| Appendices G Turnitin Checking Result .....                 | xxxv   |
| Appendices H Research Attachment .....                      | xxxvi  |

