AUGMENTED REALITY-BASED EDUCATIONAL GAMES FOR MILD DYSLEXIC CHILDREN

ARRANGED BY :

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Offering Letter

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Attachment : 1
Subject : Offering Letter

Dear.
Head of agency / company
in place

Yours faithfully,
Our organization RNF Group is dedicated and experienced in providing augmented reality-based application design services, website applications and android-based applications.
Through this offer letter, we offer a proposal for making "Augmented Reality-Based Educational Games for Mild Dyslexic Children" for dyslexic children in the Malang city area, especially those under the agency/institution you are leading. The proposals for making applications that we offer have been attached together with this letter.

We thank you for your attention and cooperation.

Malang, 27 September 2021
Best regards,

Project Manager

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Abstract

Augmented Reality (AR) is a new medium for delivering information that is currently developing. AR is a technology that combines two-dimensional and three-dimensional virtual objects into the real environment around us. Judging from the capabilities possessed by AR, AR can be used as an interesting learning medium for children. This is because AR can provide interactive and more efficient learning, because children not only learn theoretically but also see objects taught in 3D.

In this proposal will be Augmented Reality-Based Educational Games for Mild Dyslexic Children. This application is made using the Vuforia library and Unity Engine. Applications can display 3D objects of fruit and vegetables. In addition, there is audio as an aid so that children can better understand the name of the object in question. Based on the condition of dyslexic children who have delays in learning, the presence of 3D and audio objects can help children in the process of recognizing objects in the surrounding environment,

Introduction

Learning difficulties are conditions where children have IQs above average, but have learning disabilities related to sensory-motor integration. Children with special needs have the right to have a proper education like other children. This education does not include education with the category of extraordinary children but special education for dyslexic children. Children with learning difficulties usually have delays in learning to speak, write, count and spell. The number of children who have learning difficulties continues to increase every year. The government continues to strive to pay special attention to the world of education for children with special needs which is increasing every year. This also affects the development of human resources. Based on the report of the United Nations Program (UNDP) in 2009, Indonesia was ranked 111 out of 182 countries. The current ranking is far below neighboring countries, such as Malaysia (66), Brunei Darussalam (30), or even Singapore (23), (Prasetya and Widiyaningtyas, 2010:2).

Many people think that low reading ability is associated with the number of children who have learning difficulties. A study in DKI Jakarta revealed that out of 3,215 first-grade to sixth-grade elementary school students, 16.52% were declared as having learning difficulties (Mulyono Abdurrahman, 2009:10). The government also continues to strive for the development of education in Indonesia. This is no exception in inclusive education for children with special needs. Through inclusive education, children with special needs need to be given educational eligibility, as well as the same opportunities and opportunities as normal children in general. This means that a child with special needs can be defined as a child who needs an education that is tailored to the learning barriers and needs of each child individually (PP No. 17 of 2010 Article 129: (3)).

In today's technological developments, there are many variations of games, one of which is Augmented Reality (AR). Augmented Reality (AR) is now not only used as entertainment or only used for big companies in helping their performance but also for educational games as a medium for learning for school children. Although there are many decent and quality educational games, there are not a few educational games for children with special needs such as dyslexia.

From the description of the problems that arise due to the lack of learning media for children with mild dyslexia, we created learning media for children with mild dyslexia. Our goal is to help children who are classified as difficult in reading and spelling fluency, it is hoped that children can hone fluency in this game. This game will be a collection of words that will have an audio sound to help spell. This game will be designed to be as attractive as possible so that it can attract the attention of children with mild dyslexia in learning to read and spell words.

Purpose

We target children with special dyslexia at the age of 5-8 years, because this reading and spelling game is an educational game that helps children improve reading and increase vocabulary. We hope that this game will make it easier for them to read and spell words.

Benefit

The benefits obtained are:

1. Children aged 5-8 years are able to learn spelling words well;
2. Utilizing existing technology while making children with mild dyslexia feel that learning is fun;
3. Help relieve friends who work to guide mild dyslexic children.

The System Offered

Here are some explanations about the application of the game:

7.1 Mechanics and the Player's Role

In this game a child is expected to be able to read and spell the available words. The words provided are in the form of daily items such as fruits and vegetables so that children can be familiar with the things around them. The game is equipped with pictures, spelling of the words, and audio. The prepared audio can be played and heard by the players, so it can help the process of understanding and learning words.

7.2 Genre

The genre that we adopt in this game is the educational genre. Where education means education which has the meaning of a process of changing the attitudes and behavior of a person or group of people in an effort to mature humans through teaching and training efforts.

In accordance with the background and target of our players, namely children with mild dyslexia. This game is an effort that we do to make it easier for dyslexic children from the process of recognizing objects through pictures, to the process of speaking. The process of learning to talk, of course, stimulates children to read and recognize letters. If in the game, the child has difficulty reading the words, then the child can play the available audio.

7.3 Competition Modes

This reading and spelling game for mild dyslexic children uses single player mode. Where this game is only intended for one player and cannot be played by more than one player at a time. This game only focuses on one child, because we hope that children can play easily, and focus more on the learning process to understand and spell the given word well.

7.4 Technology and Resources Used

7.4.1 Unity

The Unity 3D application is a game engine that is an image processing software, graphics, sound and input, and others. Intended for making a game, although not always for games.
Unity is a multi-platform game engine. The platforms used are usually web-based, android, IoS, XBOX. With this, Unity requires a license to be published to certain platforms. but Unity provides it for free users and can be published in the form of Standalone (.exe).

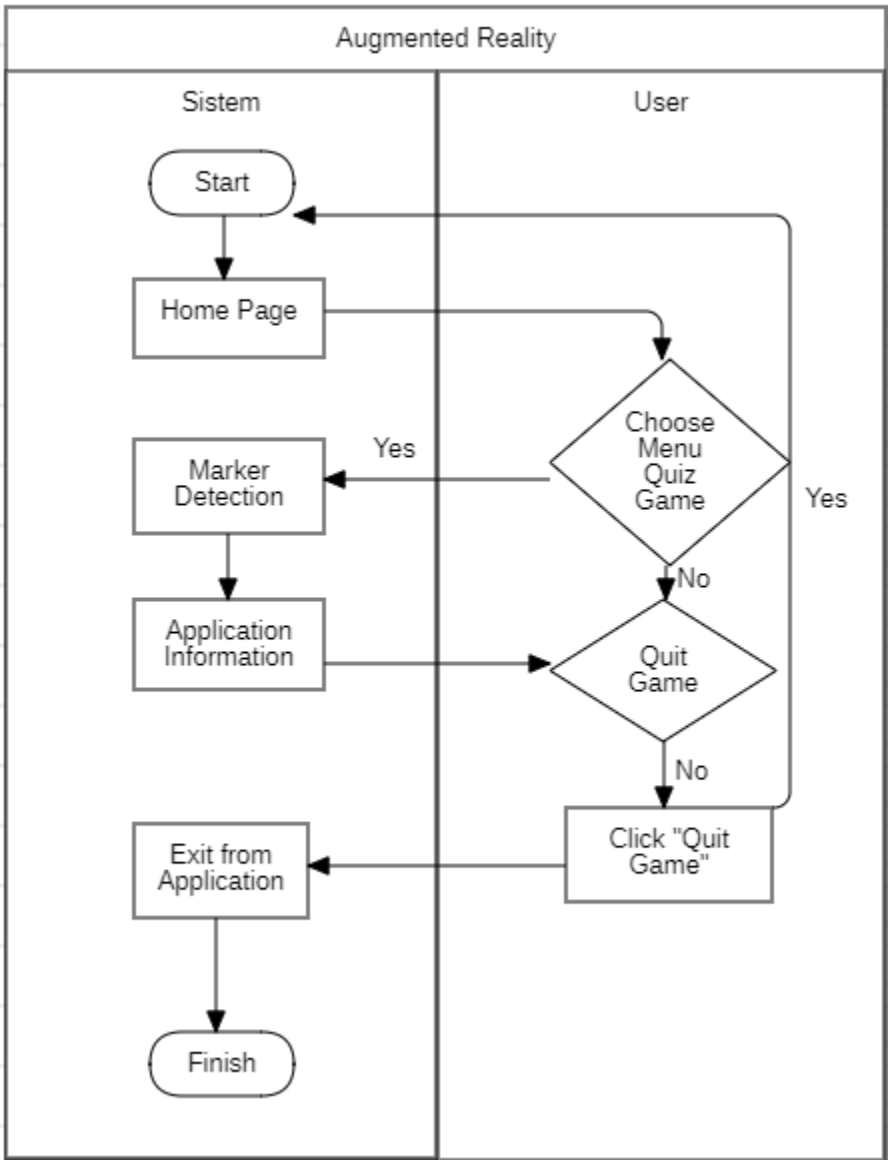
7.4.2 Vuforia

Vuforia Engine is a software development kit (SDK) for creating Augmented Reality apps. Developers can easily add advanced computer vision functionality to any application, allowing it to recognize images and objects, and interact with spaces in the real world.

System Planning

8.1 Flowchart

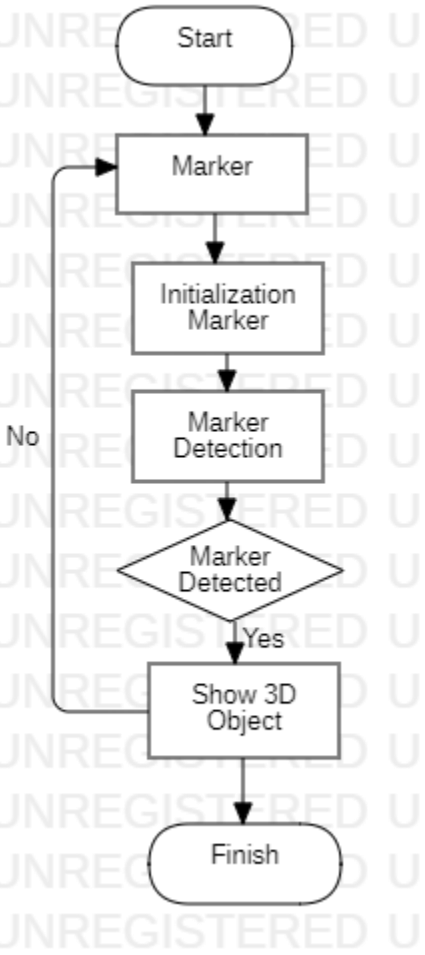
The workflow of the AR application that will be made in general is shown in the following Figure 8.1:



Picture 8. 1 Flowchart Augmented Reality

In the flowchart image above, the application will display the main menu. On the main menu, the game menu options start and exit. When selecting start, the application will activate the camera to start the marker detection process. If you are finished, you can immediately exit and exit the game.

The flow of the marker detection process in this AR application can be seen in the following Figure 8.2.



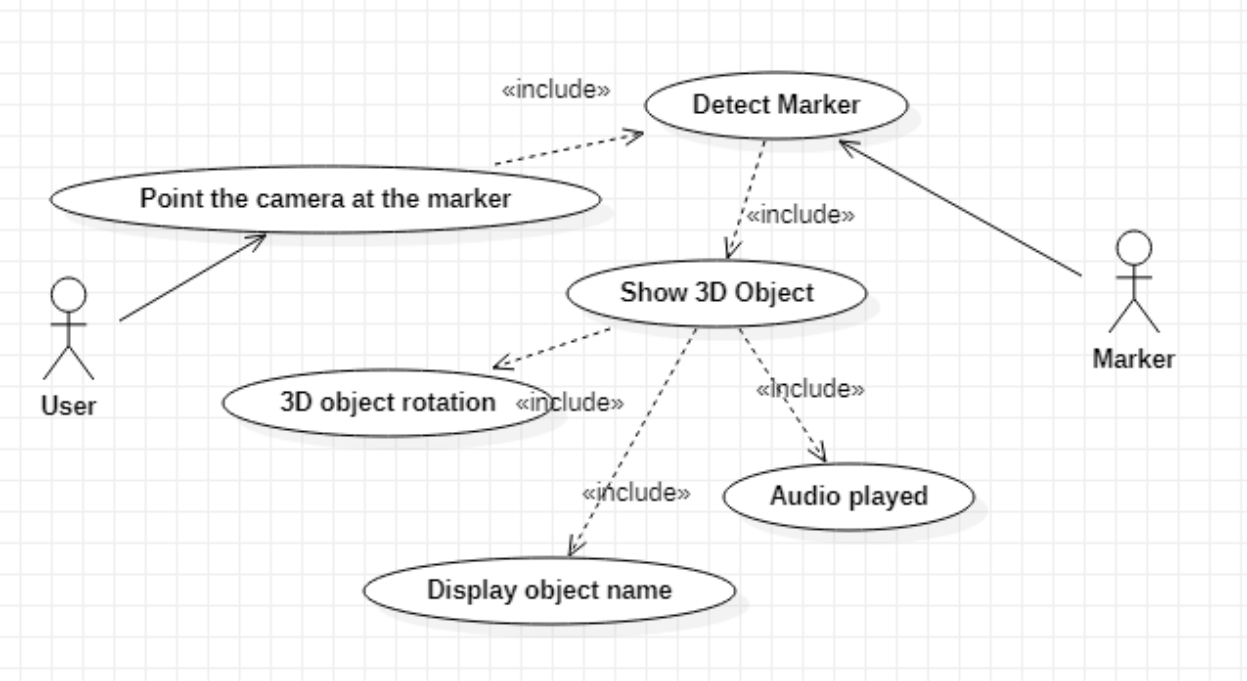
Picture 8. 2 Process Marker Detection

The marker detection process starts with the user showing the marker on the camera. Then the camera will detect the marker. Marker detection depends on several things, namely the intensity of light, the distance of the marker from the camera, occlusion (detection of the marker being blocked by something), and the resolution of the camera. If the marker is not detected, then the user must set the marker and show it back to the camera. If the marker has been detected, the application will display a 3D object that matches the marker.

This AR application requires a marker / marker to display the 3D object that has been created. The first step in initializing the marker is to upload the marker to the vuforia developer. Uploaded markers must be resized according to the provisions of vuforia. The marker file must be of type .jpg or .png. After the marker has been successfully uploaded, the next process is to download the dataset from the marker. This dataset will later be imported into Unity, to be paired with 3D objects that have been created previously.

8.2 Use Case Diagram

Use Case diagram is a model to describe the relationships that occur between actors and activities contained in the system. In this system there are actors and system users, namely users and markers. The use case diagram for this application can be seen in the image below:



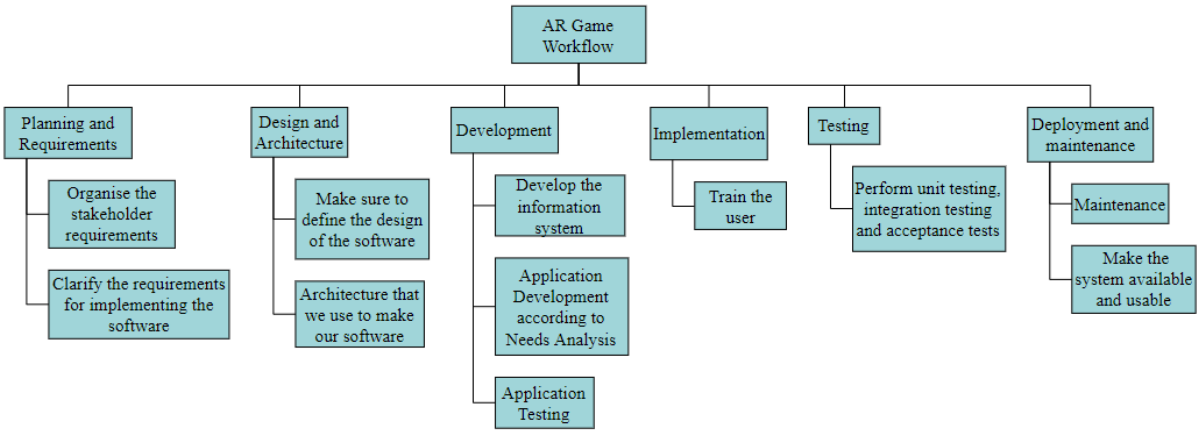
Picture 8. 3 Use Case Diagram

Schedule

9.1 Work Breakdown Structure

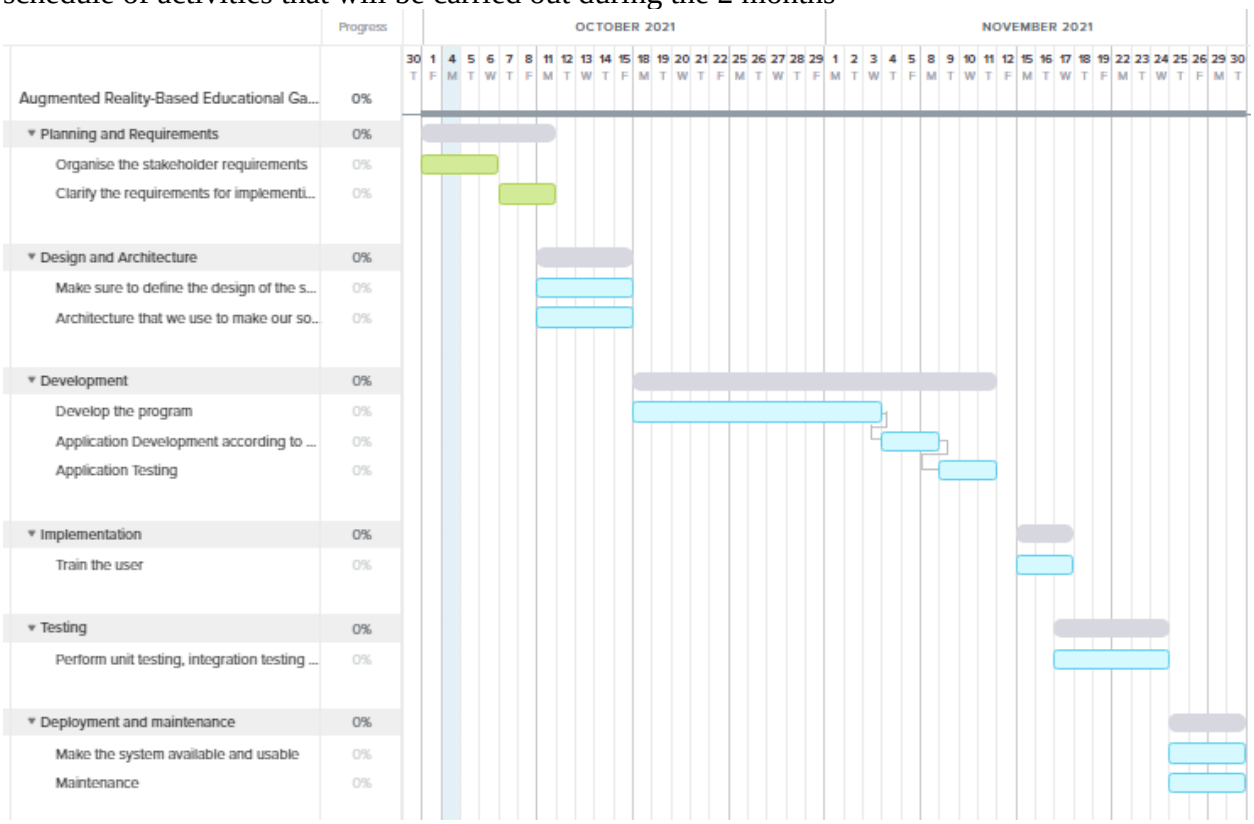
Work Breakdown Structure is a method of organizing projects into a hierarchical reporting structure. WBS is used to break down or break down each work process into more detail. This is intended so that the project planning process has a better level. As you can see in the AR Game workflow, there are 6 stages that must be done to complete this project such as planning and requirement, design and architecture, development, implementation, testing and deployment and maintenance.

Table 9. 1 Work Breakdown Structure



9.2 Timetable

The process of making this application will take approximately 2 months. Work is carried out from Monday to Friday, with Saturday and Sunday off. The project manager will contribute for 3 hours per day while other staff will work for 8 hours per day. The following is a detailed schedule of activities that will be carried out during the 2 months



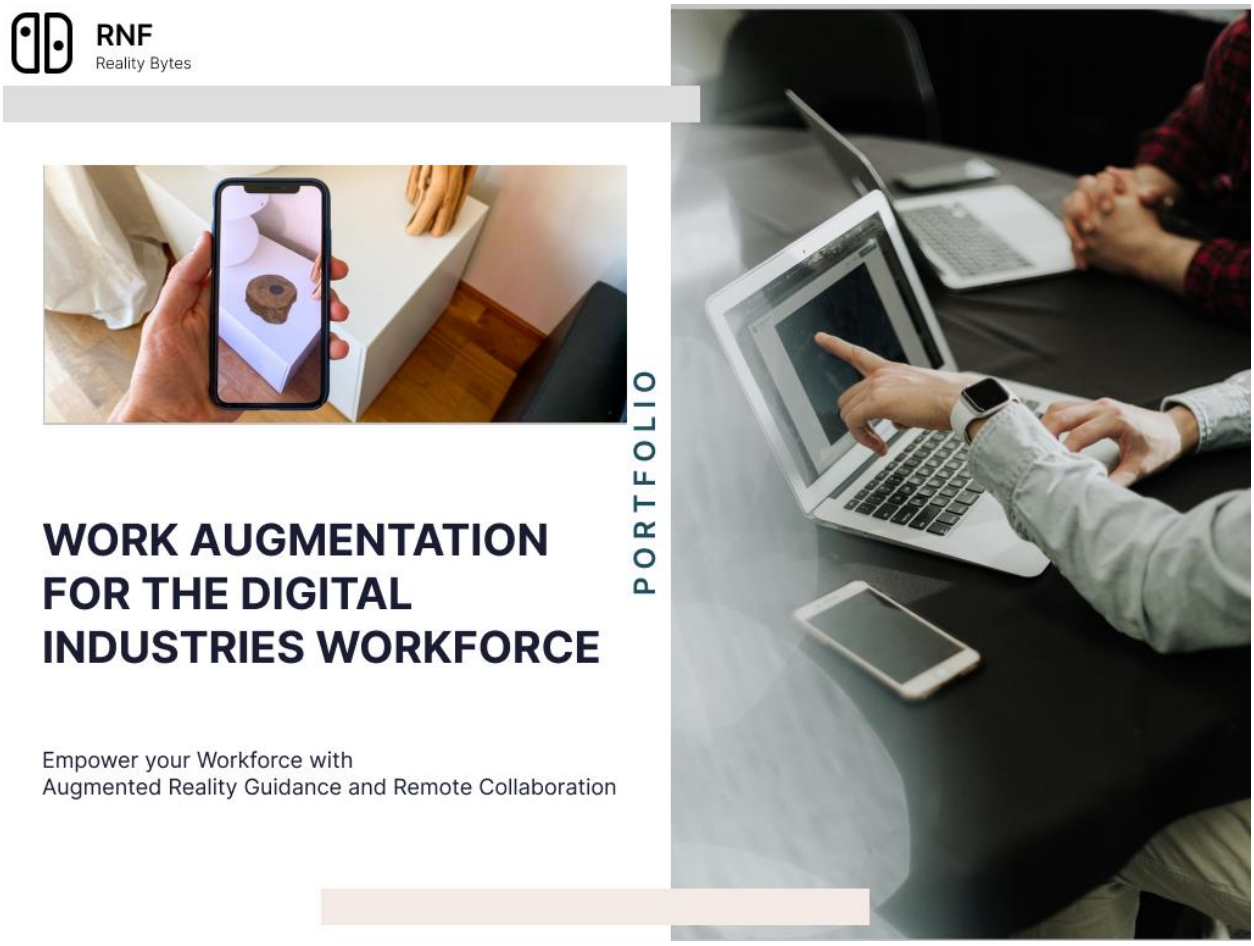
Picture 9. 1 Timetable

Organization and Responsibility

Table 10. 1 Organization and Job Description

No	Name	Description	
1	Nabilah Affryda Rihadatul'aisy	ID	1841720012
		Email	1841720012@student.polinema.ac.id
		Job Description	**Software Developer**
		Responsibility	• Writing and implementing efficient code • Training users • Testing and evaluating new programs • Working closely with other developers, UI/UX designers
2	Revinda Amalia Saktyawati	ID	1841720185
		Email	1841720185@student.polinema.ac.id
		Job Description	**Project Manager**
		Responsibility	• Predict resources needed to reach objectives and manage resources in an effective and efficient manner • Track project costs in order to meet budget • Monitor progress and make adjustment as needed
3	Salsabila Firdausy	ID	1841720036
		Email	1841720036@student.polinema.ac.id
		Job Description	**Voice Over and UI/UX Design**
		Responsibility	• Add some voice over for game design • Create design for Augmented Reality game and it will be developed by software developer

Portfolio



Picture 11. 1 Portfolio

Picture 11. 2 Portfolio Projects

RAB

Table 12. 1 Budget and Finance

Budget Plan		Sum	Unit Price (Rp)	Total Price (Rp)
A	Product Development			
	Android Smartphone	1 unit	2.500.000	2.500.000
	Game storyboarding	-	200.000	200.000
	Development in AR Software (salary for 3 staff)	44 days	395.000	17.380.000

B	Consumable			
	Internet data quota	2 month	200.000	400.000
	80gr A4 Paper	1 rim	45.000	45.000
	Printer ink (black)	1	150.000	150.000
	Printer ink (color)	1	200.000	200.000
	Office Supplies	1 set	150.000	150.000
C	Others			
	Proposal Preparation	-	100.000	100.000
	Field observation	-	250.000	250.000
	Field Test	-	300.000	300.000
			Total	21.675.000

Attachment

13.1 Mockup

Picture 13. 1 Home

Picture 13. 2 Game 1

Picture 13. 3 Game 2

13.2 Client List

Sebaya Squad at Malang and Sidoarjo. They care about dyslexia, ADHD (attention deficit Hyperactivity Disorder), friendly assessment, parent support group and supporting fun learning.

13.3 CV

13.3.1 Nabilah Affryda Rihadatul'aisy

NABILAH AFFRYDA RIHADATUL'AISY

JUNIOR WEB DEVELOPER

CONTACT ME AT

Malang, East Java

081252490648

nabilahaffryda88@gmail.com

@nabilahaffryda

linkedin.com/in/nabilahaffryda

SKILLS SUMMARY

- VueJS (Novice)
- ReactJS (Novice)
- SQL (Competent)
- PHP (Novice)
- Laravel (Novice)
- Code Igniter (Novice)
- HTML/CSS/Bootstrap (Competent)
- Javascript (Novice)
- Content Writer (Competent)
- Copywriter (Competent)
- Article Writer (Competent)
- Microsoft Office Package (Competent)

LANGUAGES

- English (Competent)
- Indonesian (Native)

PERSONAL PROFILE

Motivated IT student with experiences as junior frontend web developer. I also have skills and experience in copywriting and make article content. Enjoy working in a team and have good communication skills.

EXPERIENCE

Frontend Web Developer
PT Madani Jayantara Indonesia | June 2021 - August 2021

- Internship as a web developer and focus on working on the frontend.
- Design and develop survey manager website

Edutainment Program
UTeM (Universiti Teknikal Malaysia Melaka) | August 2019

- Participate in Malaysian cultural introduction and learning programs

Content Writer
Dailisya | 2019

- Working on biographical articles for Korean artists

Freelance Writer
Freelancer | 2018 - now

- Do various types of sales copywriting for multiple websites.

EDUCATIONAL HISTORY

Senior High School 2 Malang
Mathematic and Science | 2015 - 2018

- Participate in English speech and debate competitions at the school and university level.

State Polytechnic of Malang
Diploma 4 Informatics Engineering | 2019 - 2022

- Finalist of E-Government KMIPN 2019
- Volunteer Edutainment Program 2019 in Malaysia
- Member of the WRI (Workshop & Informatics Research) community

13.3.2 Revinda Amalia Saktyawati

REVINDA AMALIA SAKTYAWATI

OBJECTIVE

I am a very extrovert person who likes to connect with people. I am a natural multitasker and does not rest until a task is complete and satisfactory.

CONTACT INFORMATION

revindaamalia@gmail.com

081232781401

Malang, Jawa Timur

Revinda Amalia Saktyawati

SKILLS

- Creative
- Communication
- Multitasking
- Negotiation
- Working under pressure
- Time management
- Microsoft package
- Good writing skills
- Project management

EDUCATION

State Polytechnic of Malang
2018 - Now | Information Technology

Senior High School 4 Malang
2015-2018

AWARD

2019 **KMIPN 2019**
Finalis Bussiness Plan Competition 2019
- Creating business ideas that can be developed into startups.

2019 **Entrepreneur Bisnis Festival Vol.4**
Finalis Bussiness Plan Competition
- Creating business ideas that can be developed into startups.

2019 **Digital Talent Scholarship**
Kominfo Jawa Timur
- To be an example to create 1000 startups in Indonesia.

EXPERIENCE

2020 **FREELANCE BUNG.KOS**
FIELD COORDINATOR
- Work in Sunday.
- Coordination team to achieeve targets in serving customers who need services, like cleaning the room, sending package of customer accoring to the agreement of team and customers.

2020 **Digital Marketing Certificate Course**
Google Digital Garage
- Final output received a grade of 90%.

2020 **Elements of AI Certificate Cource**
University of Helsinki
- Final output received a grade of 65%.

13.3.3 Salsabila Firdausy

Salsabila Firdausy

Personal Profile

A highly motivated student looking for new experiences while continuing education. I have a positive mind and ability to adapt and create a stable environment around me. Throughout my education, I have demonstrated work ethic and teamwork to achieve my predicted grades. I am looking forward to utilizing this skill and grow professionally in a new field

Get in touch!

Mobile:
082334249009

Email:
salsa.firdausy@gmail.com

Address:
Malang, Jawa Timur

Experience

Member of LPM Kompen (campus press)
One Periode | 2018 - early 2020

- Magazine editorial staff who deals with planning magazine publishing
- Collaborate with other divisions for the success of all organizational activities

Magazine Managing Editor
LPM Kompen Magazine Edition XXVI | 2019

- Managing all parts of the division in the magazine creation process
- Cooperate with the magazine launch event team

Edutainment Program
Universiti Teknikal Malaysia Melaka | 2019

- Education and entertainment summer camp program from 18 - 25 August 2019 in UTeM Melaka, Malaysia

Academic History

State Polytechnic of Malang
Informatics Engineering Study Program

- Enrolled since 2018 to present

Islamic Boarding Senior High School of Sabilillah Malang
Major in Science Class

- Enrolled since 2015 to 2018

Skill and Abilities

- Creative
- Multitasking
- Time Management
- Organizational Skills
- Presentation Skills
- Microsoft Package
- Corel Draw
- HTML and CSS