

BORNOKOTHA - AN EDUCATIONAL GAME FOR KIDS

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This Report Presented in Partial Fulfillment of the Requirements for the
Degree of Bachelor of Science in Computer Science and Engineering

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DHAKA, BANGLADESH

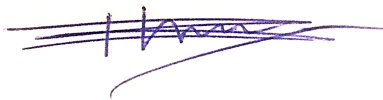
MAY 2021

APPROVAL

This Project titled **Bornokotha**, submitted by **Hridoy Krisno Bala** to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 08 September 2020.

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I hereby declare that, this project has been done by us under the supervision of **Dr. Sheak Rashed Haider Noori, Associate professor & Associate Head Department of CSE** Daffodil International University. I also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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ABSTRACT

Some people may have difficulty reading and learning Bengali. Especially those students Who are studying from English medium Often even the youngest students in the Bengali medium system do not get enough time in class to understand the language better. Also, many foreigners have shown interest in learning Bengali language. In this project, I initially created a language learning tool for the Bengali language targeting the above-mentioned audience. We have noticed that the development of smartphones has increased dramatically in the last few years. My developed virtual learning systems are not intended to replace books, lectures, classrooms, teachers, and the methods of teaching and learning currently applied. Rather, it will serve as a helpful tool or practice tool for learning the Bengali language.

As promised, I have provided entertainment for young learners by including interactive games, which will help them remember and have fun at the same time. Includes quizzes and small challenges for users to evaluate newly acquired knowledge

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CHAPTER 1

Introduction

1.1 Introduction

To preserve and develop culture and promote it all over world ,“languages” are most important and powerful way. We are Bangladeshi and our mother language is Bangla. But it was not easy to us acquisition this language. There is a bloody history behind it. It was on the 21st February in 1952 when patriotic and heroic personalities like **Salam, Jabbar, Rafique, Barkat** and a lot more sacrificed their lives for the sake of their mother language. After that **UNESCO** declared Bangla as an international language on “17th November 1999”. At present it is known as “**International Mother Language Day**”.[1] No other nation has such prideful history, so it is our pride. And we all loves our Bangla Language .I believe that this project is a medium of love towards our mother language “Bangla”. The project is named "**BORNOKOTHA**". I am going to build a mobile application with a clear objective to make the path of learning "Bangla".

1.2 Motivation

Bengali is our mother language. We started learning Bengali at an early age. However, many times we can not read and write easily. My goal is to make education easier and more enjoyable.

1.3 Objective

Making Objective:

- Helps to people learn basic of Bangla .
- Kids can have learning with fun.
- Making the Bengali language learning more easier to foreigners.
- To make Bengali language open for all age.
- To put more emphasis on Bengali language learning.

Reasons to Choose this app:

- Free download
- Easy to access
- Easy to understand
- Learning through playing games.
- No need Internet to excess after downloading..

1.4 Expected Outcomes

- know much more about game engines & its works.
- Know Constructed a model and how to it is animated.
- Expertise to create software product report
- Communication skills is developed
- Increasing creative thinking and imagination capability

1.5 Report Layout

.In chapter one am written about summary, project objectives, expected outcomes from Bornokotha & my achievement from this project.

The short history of game(video game & educational game), related work,comparative analysis ans Scope of the problem will be discussed the next chapter.

Full system of Bornokotha application will be describing in third chapter.Also describing about use case diagram and all requirement of design.

In four chapter implementation design & requirement terms will be described.

I will describe the software testing implementation and its result in chapter five.

After that conclusion and feature improvement will discuss on chapter six.

CHAPTER 2

Background

2.1 Preliminaries

The two meanings of “game” in the title are “play” and “hunted animal.” The word “game” is used to refer to animals that are hunted. The game that Zaroff hunts is human beings. A game is an organized type of play, as a rule embraced for amusement or fun, and now and again utilized as an instructive device. Games are particular from work, which is generally completed for compensation, and from workmanship, which is all the more regularly a statement of stylish or philosophical components. A Physicist first Invents Video Game. Physicist “William Higinbotham” created first video game on October 1958. It was a very simple “tennis game” like Pong which is 1970s video game.[2] On the other hand, “Logo Programming” was the first real educational game. This is released by Turtle Academy in 1967 with the intent of teaching people how to program using the LOGO programming language.[3] Though “Bornokotha” is a educational game, I think people will benefited by using this application much more.

2.2 Comparative Analysis

Existing solution analytics chart. It shows the different between Bornokotha with existing games.

Game Names	Features							
	স্বরবর্ণ	ব্যঞ্জনবর্ণ	বর্ণমাত্রা	শব্দমালা	জানা অজানা	বর্ণের খোঁজ	অঙ্কবিদ্যা	স্মৃতিশক্তি
আদর্শলিপি[4]	yes	yes	no	no	yes	no	no	no
Jalebi[5]	no	no	no	yes	no	yes	no	no
Kids Learn Bangla[6]	yes	yes	no	no	no	no	no	no

Kids Math[7]	no	no	no	no	no	no	yes	no
Snakes & Ladder[8]	no	no	yes	no	no	no	no	no
Picture Match[9]	no	no	no	no	no	no	no	yes

2.3 Scope of the Problem

Bornokotha Application is made for educational purposes. For learning Bangla in a more interactive way. There are many features which will make this app more functional. I will introduce it in the near future. I will make 3 different categories for learning:

1. Beginner : In this stage the user can learn vowel and consonant.
2. Intermediate: After that user is ready to learn how to write and read a simple word.
3. Advance: Finally this stage will clear to user , how to write a sentence .in this section have some grammatical rules, quiz and some test.

After qualifying the advanced category a person will be ready to read and write Bangla.

There are plenty of features I can include. For example, ! can introduce shape memory games, Some of math's game and many other things.

So to say, Bornokotha can be an extremely useful application for learning Bangla.

CHAPTER 3

Requirement Specification

3.1 Requirement Collection and Analysis

Data Requirements

For making this application I have need some of data. I gathered information from both primary and secondary sources.

- Primary Source: I used different methods for collecting information ,there are
 - ◆ Collecting information from different books by reading them.
 - ◆ Collect different idea from educational game.
 - ◆ Content provided in YouTube.
- Secondary: The secondary sources of data collection for the application includes-
 - ◆ Some of different Websites which define globally accepted standards.
 - ◆ Some of Websites which keeps track of education system.
 - ◆ Different articles related to our work

Software Requirements

- **Unity (game engine) [10]:** Unity3D is an amazing cross-stage 3D game engine and an easy-to-development environment. Simple enough for the beginner and incredible enough for the master; Unity should intrigue anyone who needs to effortlessly make 3D games and applications for portable, work areas, the web, and consoles.
- **Rider (code editor) [12]:** C# and .NET development that comes with ReSharper functionality built-in.
- **Adobe Photoshop (graphics editor)[11] :** Photoshop is a photo editing graphic design software that helps users create a variety of graphic as well as digital art.

3.2 Use Case Modeling and Description

In this part I describes the Software Requirements Specification of Bornokotha applications by analyzing the proper models of requirement engineering



Figure 3.2.1: System Diagram

This Model showed how the user interacts with the application and the specific sequence of activities that occur as the software is used.

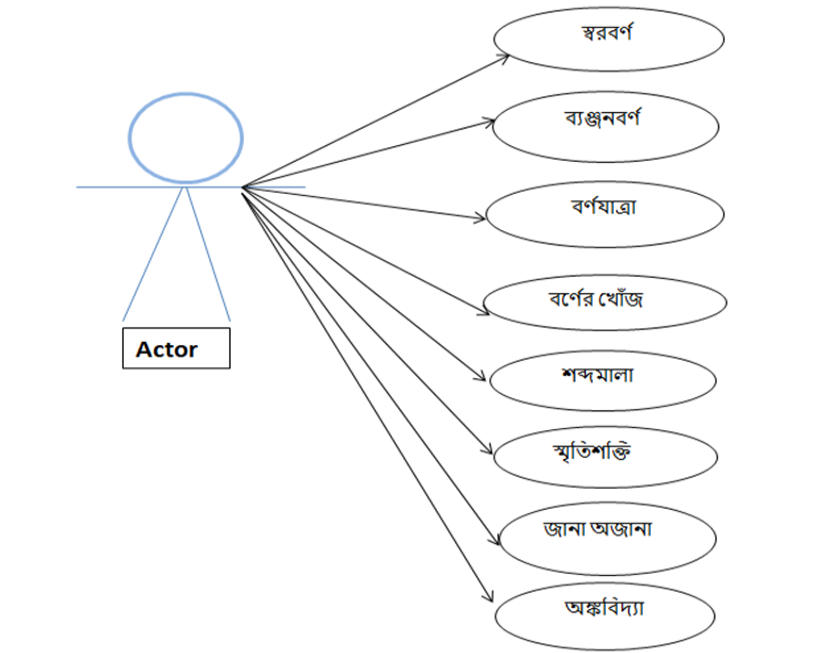


Figure 3.2.2: Use Case Diagram

3.4 System Description



Figure 3.4.1: Game icon of Bornokotha

When the user opens the application , it shows 8 iconic options to click to start with the app. The options are-

1. স্বরবর্ণ
2. ব্যঞ্জনবর্ণ
3. বর্ণযাত্রা
4. শব্দমালা
5. জানা অজানা
6. বর্ণের খোঁজ
7. অঙ্কবিদ্যা
8. স্মৃতিশক্তি



Figure 3.1.2: Main menu interface of 'BORKOTHA'

1. When pressing স্বরবর্ণ it loads a new screen which shows the 11 vowels of Bengali language in serial like: অ, আ, ই, ঈ To ঔ।



Figure 3.4.3: interface of স্বরবর্ণ

With vowels we also see a word with a appropriate image which starts with that vowels . That's make more interactive this lesson. When user press next button then he/she get next vowel & when pressing previous button gets previous vowel.

2. After pressing ব্যঞ্জনবর্ণ it loads a new screen which shows the 39 Alphabet of Bengali language in serial like: ক,খ,গ To ঁ. Its also have a word with appropriate image View. Its next and previous button works like previous interface.



Figure 3.4.4: interface of ব্যঞ্জনবর্ণ

3. When pressing বর্ণযাত্রা it loads a new screen which shows a game likes "snake and ladder" game which is showing following figure:

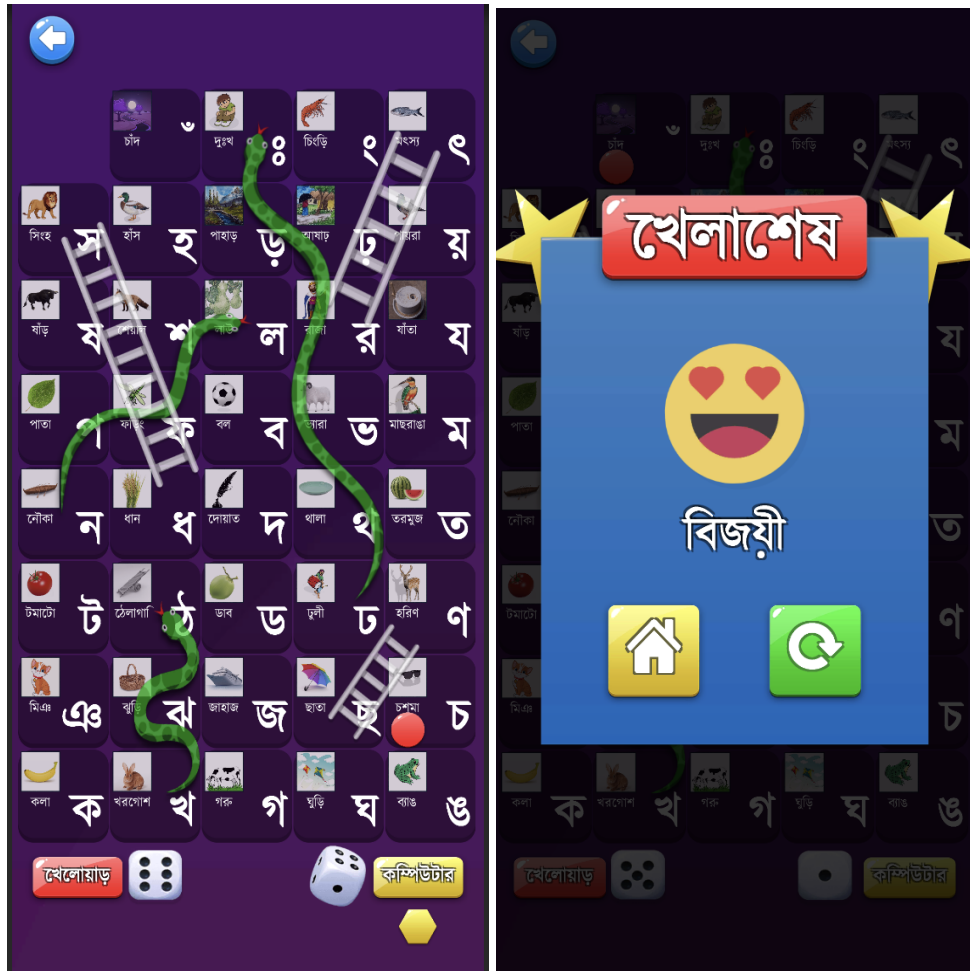


Figure 3.4.5: interface of বর্ণযাত্রা

User will play this game by pressing dice with build in player. This games logic is like snake and ladder game, Two players will play this game, user & computer (artificial intelligence player). Between them who will goes to the top fast he/she will be winner. When someone plays this game he/she learn alphabet with fun & remembering the alphabet easily.

4. After pressing শব্দমালা, opening a new page, which is another interesting game. To finding appropriate characters for making new word.



Figure 3.4.6: Interface of শব্দমালা

When player chooses a right character then highlighted text green color user get 10 points & game will be loaded next level. When player input the wrong character then highlighted character with red color and games will be over.

5. User can play another interesting game for learning new thing when he pressed জানা অজানা. This game is like matching figure with appropriate word. This game is very helpful & interesting for foreigner and kids.



Figure 3.4.7: Interface of জানা অজানা

This game is made with that word & image which is completed in previous lesson of Bangla vowel & alphabet . It is like a task. It's also highlight when get right or wrong input.

6.As like when pressing বর্ণের খোঁজ then its open a new screen fill in the gaps or multiple choose like this picture:



Figure 3.4.8: Interface of বর্ণের খোঁজ

It is like a task for learning spelling. This game making with that word which is completed in previous lesson of Bangla vowel & alphabet .After completing this game user can learn spelling with fun, because after correct answer player gets point & participate the next level. Green color means its right answer and red color means wrong answer.

7. when user pressing অঙ্কবিদ্যা then its open a new screen ,in this session user learn simple addition, subtraction, multiplication and division. So to say its a math game.



Figure 3.4.9:Interface of অঙ্কবিদ্যা

After completing this session user's basic concept will more clear before past. Here also player get the point for next level.

8. When user pressing on স্মৃতিশক্তি then user get a new screen ,the new screen represent a “ shape memory game:” After playing this game user known about shapes likes Circle, rectangle, triangle etc.



Figure 3.4.10:Interface of স্মৃতিশক্তি

This game system is more advanced because the player gets only 60 sec for matching the shapes. If it matches then the player can excess the next step or game will be over. This game changes players' mind eassliy.so it is helpful for users' mental health.

All of the games/ lessons which are describing this section ,the user sees the home icon & reload icon .When pressing home icon then it go to the main interface & when pressing reload icon that page will be reloaded.

3.4 Design Requirement

For all of the software product 2 key terms of design is very important , They are:

1.**UX (User Experience)** : User experience (UX) is an extraordinary control of configuration, based on end-user brain research - or on account of ongoing interaction, players - and their practices, points of view, and capacities. The UX is important for a bigger tool stash that you have intended to ensure your player's brain is really reflected. It applies genuine information on players 'conduct and thinking cycles and it joins information assortment, a dull plan measure, and numerous sorts of tests with genuine players.

2.**Backend Programming** : Unity Game Developer works for backend programming of games. This requires C# language and Dot Net framework.

CHAPTER 4

Design Specification

4.1 Interaction Design

The user can open the game first and see 8 buttons. The buttons are arranged in such a way that the user can know the Bengali letters and words. And will be able to practice in the future. If the user takes part in a test and answers correctly, a new level will be unlocked and 10 points will be added. If the user makes a mistake, the game will end. This will give the user a new experience. User interface elements and animation has been added to enhance the user experience.

4.2 Implementation Requirements

Quality Function Deployment is a technique , which fulfills the needs of the customer into technical requirements for software/game. It concentrates on increasing user satisfaction from the Software engineering process. For this project, I following 3 requirements:

1. Normal Requirements for Bornokotha
2. Expected Requirements for Bornokota
3. Exciting requirements for Bornokotha

a. Normal Requirements for Bornokotha : Objectives and goals consist of normal requirements, which is stated during the meeting with the relevant people. There is some normal requirement for Borokotha project-

- i. Easy to understand effective and rewarding framework.
- ii. Least support cost (perhaps designs definition).
- iii. The game with estimated coding, proficient reasoning.

b. Expected Requirements for Bornokotha : It implicit to the system.

- i. Create frameworks within limited spending.
- ii. Most final higher quality.

iii. Minimum equipment requirements those are relevant to this game.

iv. Plan the whole structure in an effective way.

c. Exciting requirements for Bornokotha: These requirements are for features that go beyond the customer's expectations and prove to be very satisfying if present

i. I will add a tutorial that will make it easier for users to understand the game.

ii. Make it easy to update the system

External Interface

In this section I will describe external interface requirements for my project:

- User Interfaces :
 - Menu bar for easily operate the game.
 - User Manual to known easy ho to excess this application.
 - Setting option for set sound, text size etc to fulfill user need

- Hardware Interfaces:
 - 6+ core xeon CPU
 - 32gb RAM
 - High-End graphic card
 - 2 monitor SSD+HDD

- Software Interface:
 - Unite 3D
 - Adobe Photoshop
 - Rider

Chapter 5: Implementation and Testing

5.1 Testing Implementation:

Software testing is most important for finding mistake of works. because a simple mistake sometimes causes of software failure. its need to double check because of avoid humans mistake. softwter testing is costly and we can not find our own mistakes bt if second person (who is do not directly doing code) checking code, then easily finding the mistake.

5.2 Test Results and Reports:

SL	Test Name	Results
1	Installing the game on android phone	Passed
2	Check Game Buttons	Passed
3	Check Text Size	Passed

CHAPTER 6:

CONCLUSION & FEATURE WORK

7.1 Discussion and Conclusion

A Software project means gathering lots of experience .Though it is a gaming application, so I know more about game engines & its works, all of its properties and others. I also know much more about models constructed and animated. Now my skill and expertise increase to create a SRS document and software product report. The project will succeed when billions of people learn with Bornokotha ,it will give me more peace and pleasure.

7.2 Scope for Further Developments

I have a lot of ambitions for my project. I cannot fulfill my ambitions for time limitations and for more knowledge. I want to add more functions in my project.

Some of them are-

- Extend more levels.
- Multiplayer game play
- One leaderboard which showed user progress.
- A user profile where the user can add his photo, name and many other things.
- Game Monetization

APPENDIX

Game Engine:

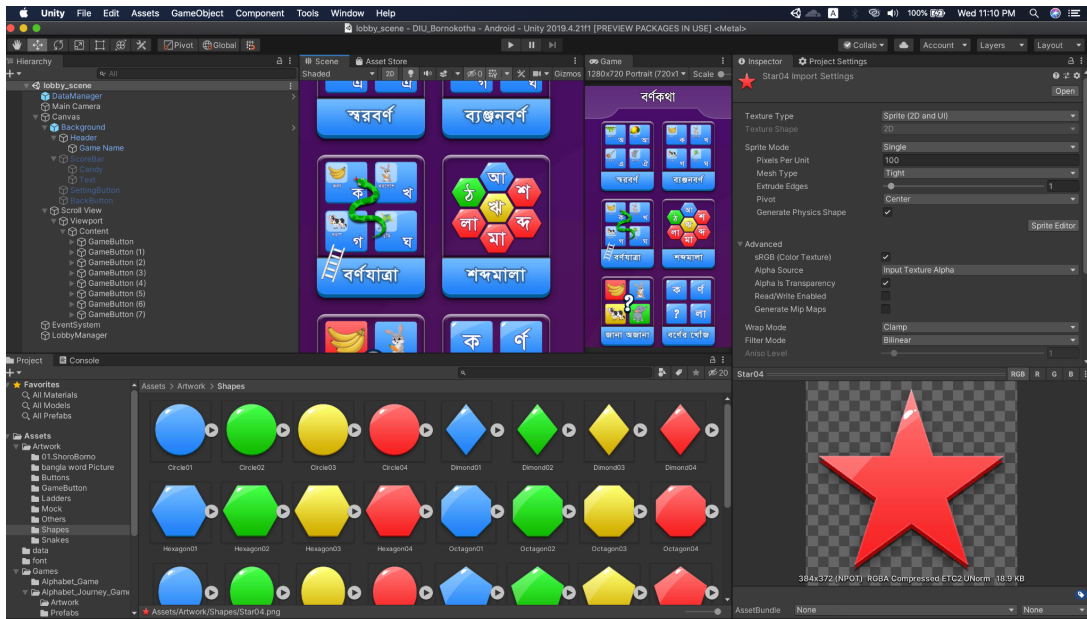


Figure A1 : Game Engine

Code Editor:

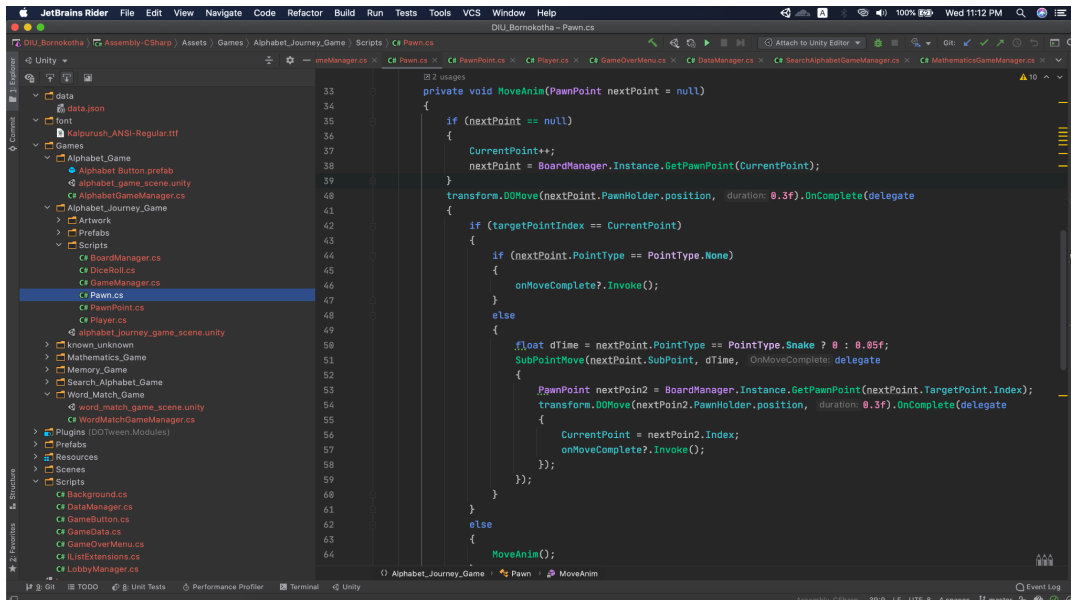


Figure A2 : Code Editor

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