For

Second Year Project Proposal

Bachelor of Science in Information Technology

Candy Crush Game

Submitted by

KEZANG DORJI

Gyalpozhing College of Information Technology

Read carefully before filling the form.

1 Please do not alter the layout of the application form. Information must be filled in the spaces provided, under set format.

2 Guidance notes in various fields should not be deleted.

3 Required information should be duly filled in the specified fields.

4 Required heads/fields which are not relevant to the project should be marked **N/A** (Not Applicable) or left blank and should not be deleted.

Bachelors of Science in Information Technology
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Guidelines and Forms

Submission Procedure

Duly filled proposal forms completed in all respects should be submitted in form of soft copy and a hard copy to project guide and project coordinator. On receipt of the applications the proposals will be evaluated by reviewer panel and proposal would then be defended by student groups. The project group may need to revise the proposal in light of the evaluator's recommendations.

For further information, please contact:

Project Coordinator

Jigme Wangmo
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Application for Final Year Project

1. Project Identification

<table>
<tr><td>A</td><td colspan="2">Reference Number:

(for office use only)</td></tr>
<tr><td>B</td><td colspan="2">Project Title: Candy Crush</td></tr>
<tr><td>C</td><td colspan="2">Project Internal Guide:</td></tr>
<tr><td></td><td>Name:</td><td>Sonam Wangmo</td></tr>
<tr><td></td><td>Designation:</td><td>lecturer</td></tr>
<tr><td></td><td>Organization:</td><td>Gyalpozhing College Of Information Technology</td></tr>
<tr><td></td><td>Mobile # :</td><td>17391134   Tel. # :</td></tr>
<tr><td></td><td>Email:</td><td></td></tr>
<tr><td>C1.</td><td colspan="2">Project External Guide:</td></tr>
<tr><td></td><td>Name:</td><td>NA</td></tr>
<tr><td></td><td>Designation:</td><td></td></tr>
<tr><td></td><td>Organization:</td><td></td></tr>
<tr><td></td><td>Mobile # :</td><td>Tel. # :</td></tr>
<tr><td></td><td>Email:</td><td></td></tr>
<tr><td>C2.</td><td colspan="2">Student Group Lead:</td></tr>
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</table>

D	**Organizations Involved in the Project:**
	(Please identify all affiliated organizations collaborating in the project, and describe their role/contribution to the project.)

D1. Industrial Organizations:

#	Organization Name	Role / Contribution
	NA	

D2. Academic Organizations:

#	Organization Name	Role / Contribution

D3. Funding Organizations:

#	Organization Name	Role / Contribution
	NA	

E	**Key Words:**
	(Please provide a maximum of 5 key words that describe the project. The key words will be incorporated in our database.)

F   Research and Development Theme:

Is to reduce the stress so that person do not suffer from depression for every age group.

Usually most people suffer from stress of work,bullying,harassment and peer pressure leading them to depression which cause suicide and problem in family in order to reduce number of this my candy crush game will help in reducing the stress level. That is why main theme for my project is to reduce the stress so that person do not suffer from depression.

G Project Status:

(Please mark ☑)

☑New   Modification to previous Project

Extension of existing project

H Project Duration:	
Expected Starting Date:	09/02/2021
Planned Duration in months:	6 month

2. Scope, Introduction and Background of the Project

A Scope of the Project:

My project aim to provide a game that will help you to reduce stress and make you relax for a time being. It can be played by all type of age.

B   Introduction (Project Background and Literature Review, Current State of the Art):

Artificial Intelligence (AI) has been developing since World War Two, making it one of the newest fields of Science and Engineering. Today AI is making itself more present in our daily lives as AI applications now are embedded in all industries. Throughout the development of AI, games have been used as test environments and several groundbreaking feats have been accomplished in this sub field of AI.

In **1997** IBM Deep Blue beat Garry Kasparov in Chess and in **2016** Deep Mind's Alpha Go beat Lee Sedol in the game of Go. In this thesis they investigated the potential use of bots—AI agents—to play mobile games in order to improve quality assurance and development, hopefully resulting in a better experience for players. Opportunities to apply AI in game development was investigated and the mobile game that was used as a test is King Candy game. Ever since game are categorize as, game without opponent (called single-player games, puzzles or optimization games), games with one opponent (two-player games) and games with several opponent (multi-player games).

Candy Crush Saga (Candy) was released in **2012** by King. Candy is a single-player stochastic game with occasional hidden elements. The game board in Candy can contain up to **9x9** positions. Every position on the game board contains a candy. Each level in Candy can have different numbers of available moves, different amounts of jelly, different blockers and other features. The player's task in Candy is to complete levels. In order to complete a level the player needs to complete the level's objective. There are six different types of levels: Moves levels, Jelly levels, Ingredients levels, Timed levels, Candy order levels and Mixed levels.

The objective for Moves levels is to obtain a certain score by using a predetermined amount of moves. The player's score on the level is the accumulated score of the individual scores for each of the moves the player makes. The objective for Jelly levels is to remove all the jelly on the game board, which is done by removing candies on

top of the jelly. The objective for Ingredient levels is to move the ingredients on the board down to certain positions on the game board.

In Candy order levels the objective is to remove certain types of candies. Mixed levels have more than one objective. Possible moves a player can make are matching three or more candies in different ways, when matching more than three candies special candies appear, matching four candies in a column or a row creates a Striped candy, matching five candies in a column or a row creates a Color bomb. The special candies are more powerful than regular candies; when matched with other candies or other special candies they have a greater effect on the game board. After removing candies on the game board new candies appear, the new candies presented are chosen randomly from a set of available candies for the level. Levels can also contain blockers. Blockers prevent the player from reaching candies, different blockers are: Icing, Licorice lock, Chocolate and many more.

An attempt on a level is finished when the end state is reached. On all levels except Timed levels an end state is reached after a number of moves are expended. End state can also be reached prior to expending your available moves if the players either fails to remove elements such as Bombs from the board, see bottom of level **100** in Figure **2.3,** or finishes the level's objective**2**. We believed that the diverse set of challenges and features that Candy presents provides a great challenge for any AI agent.

Literature Review:

In 2003, Morahan-Martin and Schumacher said that person who are lonely were inhibited socially, self conscious, unwilling to disclose and sensitive to rejection were able to overcome this by playing game and able to make friend through game. Therefore, it is both timely and imperative to know the reasons that so many people become addicted to this game. Since Candy Crush Saga was launched, little research has been done on its effects on the players of this game. Thus, the present study is one of the few empirical investigations that focus on the relationships between psychological factors (i.e., gratification, loneliness,leisure boredom, and self-control) and mobile social game addiction. Based on the case of Candy Crush Saga, this study aims to deepen the understanding of the ''at-risk" population and provide information that could be used to develop a program that prevents addiction.

According to the Wall Street Journal(2013), nearly 15 million people in Western countries were addicted to candy crush saga of which 69% were female. This report not only changed the myth that game player's are predominantly male but also demonstrated the tendency of Candy Crush Saga players to become addicted to the game.

 According to Lo et al people who have difficult time in facing face to face were able to engage in social interaction through Candy Crush game. Such as sharing achievements, requesting lives, and seeking help from Facebook friends.

C **Challenges:**

• **Completion of task on time.**

It's my first time developing app so it will be difficult to develop fully functional app within 6 month.

• **Player may not like my game.**

Since I am new to this field I may not able to put the features that player might require in candy game and graphic will be low compare to another candy game so because of this player may not like my game.

• **To put sound effect in Candy game will be difficult.**

Usually in candy game if three pair of same candy are match then candy is remove so in this time their need to be sound effect so it will be very difficult to put at exactly at particular time.

• **To create different level for candy game in this semester will be different.**

Since we have only 6 month to build fully functional app on top of that I am new to app development so to develop different level will be difficult.

D **Motivation and Need:**

(Please describe the motivation and need for this work.)

Motivation:

Company are bringing game elements into the workplace to motivate employees to engage in initiatives from learning to quality improvement. Grounding gamification theory in experience, I examine the popular game Candy Crush Saga. Candy Crush contains four design elements that managers can bring into the workplace to more successfully motivate workers: It provides early and progressively bigger successes, actively celebrates your victories, provides help if you need it, and provides a vision for the future.

Need:

Game is the one thing that everyone like to play so because to complete the game a person have to complete task in a way it increase IQ of the person and able to make friends in a way their communication skill improve.

3. Aim and Objectives of the Project

(Please write the actual aim of your project. Also, describe the measurable objectives of the project and define the expected results. Use results-oriented wording with verbs such as 'to develop..', 'to implement..', 'to research..', 'to determine..', 'to identify..' The objectives should not be statements and should not include explanations and benefits. The objective should actually specify in simple words what the project team intends to achieve (something concrete and measurable/ deliverable). Fill only those objectives that are applicable to the proposed project.)

AIM : "Is to develop candy crush mobile game so that everyone can play and enjoy my game".

OBJECTIVES :

- **Help you to reduce stress by playing candy crush game.**

  It is because it is enjoyable and engaging and it provide new challenge which lead to feeling of competence which make us feeling good in a way it reduce stress.

- **Increase IQ of that person**

  Playing game can result in a tiny hit to school academy performance but it do not affect a child's intelligence. According to some research, strategies game can increase older adults brain functions, and perhaps even protect against dementia and Alzheimer's.

- **Improve communication and team corporation.**

  Game is fun and engaging way of connecting with people and act as an important teaching tool in developing social skills. It also help to develop cooperation skills and supporting skill as players have the option to work together to form alliances and create teams working cooperatively.

- **They ward off symptoms of depression**

  Game has been one of the key to reduce symptoms of depression. According to American Geriatric Psychiatry in 2010 has done studies on 19 participants between age group of 63 to 94 year who have been diagnosed with Subsyndromal Depression. They let participants to play game two hours a week throughout the twelve week study. They found out that 86% enrolled participants found significant improvement in depression symptoms.

- **Help you to read and focus**

  According to Science Direct studied in 2013 said that playing game help in reading abilities of participants with dyslexia improved at the same rate as 1 year of reading development classes. The rate of improvement matched that of highly demanding traditional reading treatments, which are certainly more time consuming than occasional gaming.

4. Methodology

A **Development / Research / Test Methodology:**

(Please describe the technical details and justification of your development and research plan and test plan and testing strategies. Identify specialized equipment, facilities and infrastructure which are required for the project and their utilization plan. The block diagrams, system flow charts, high level algorithm details etc. have to be provided in this section. Also, describe the overall methodology to be used for the particular research topic)

Development of project I have use freemium model
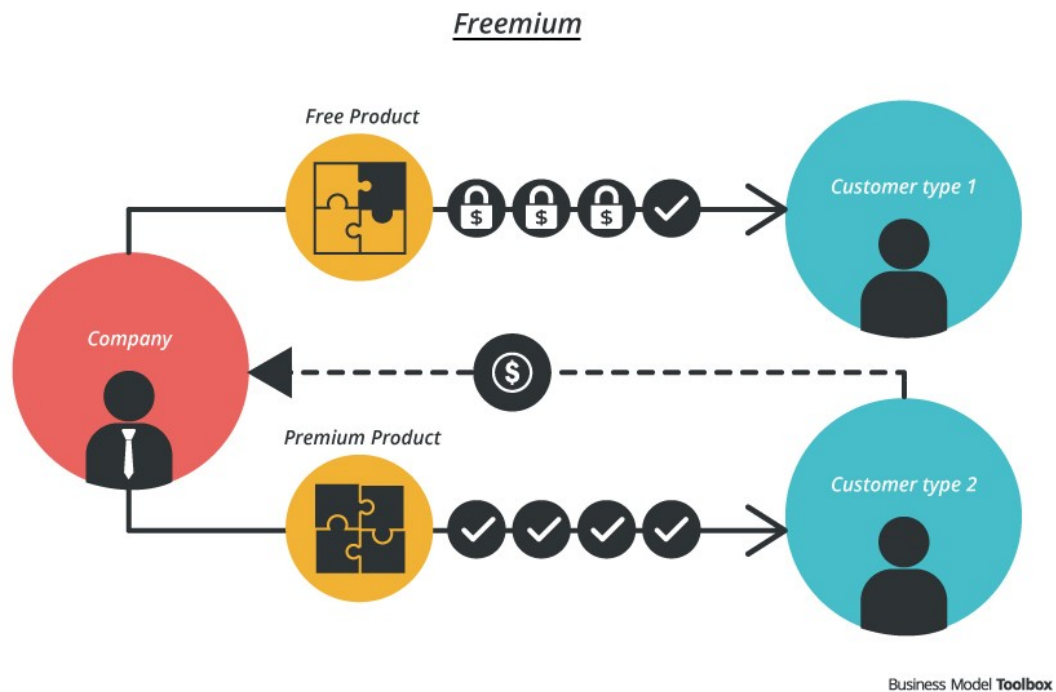
Figure 1

Since the 1980s, freemium has been common practice with many computer software companies. They offer basic programs to consumers that are free to try but have limited capabilities; to get the full package, you have to upgrade and pay a charge. It is a popular model for game companies as well. A combination of the words "free" and "premium," the term *freemium* is a type of business model that involves offering customers both complementary and extra-cost services. A company provides simple and basic services for free for the user to try; it also offers more ad-

vanced services or additional features at a premium. All people are welcome to play the game for free, but special features and more advanced levels are only unlocked when the user pays for them.
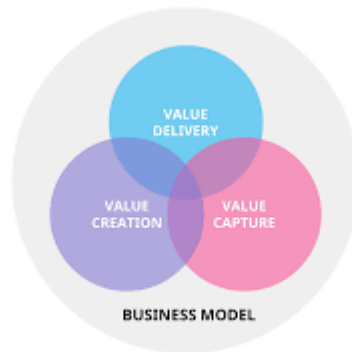

Figure 2

The freemium model tends to work well for Internet-based businesses with small customer acquisition costs, but high lifetime value. The freemium business model allows users to utilize basic features of a software, game or service free, then charges for "upgrades" to the basic package. It is a popular tactic for companies just starting out as they try to lure users to their software or service.

To check the feasibility of the project, the I had conducted the survey using google forms to the user. To develop an android app for candy crush game.

Research:

I have done small research to determine the feasibility of developing an android game for this project. The research was conducted through google survey form and it was targeted to GCIT student. With this survey, i had recorded the following details:

Do you play games on mobile?

21 responses

- Yes
- No

95.2%
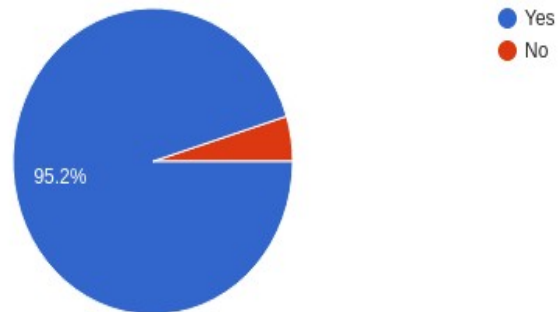
How many hours do you play games daily in mobile?

21 responses
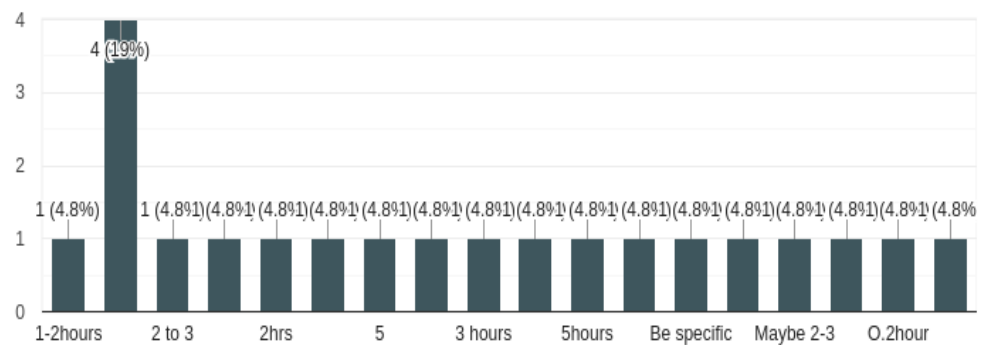
In what platform do you prefer playing games of your interested

21 responses

- mobile
- laptop
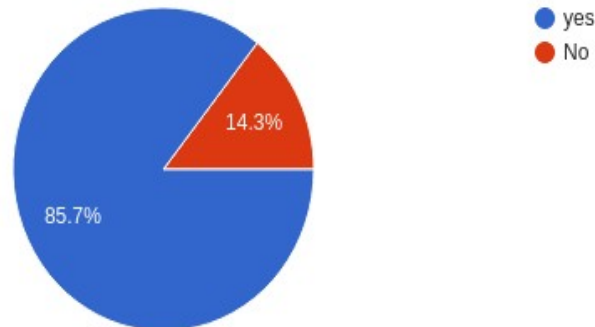- Computer

95.2%
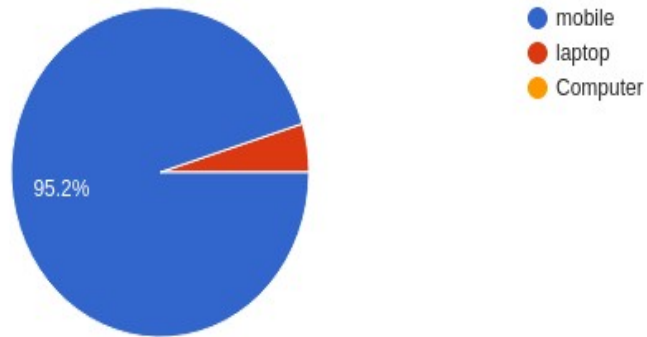
Have you ever played candy crush game ?

21 responses

- Yes
- No

19%

81%
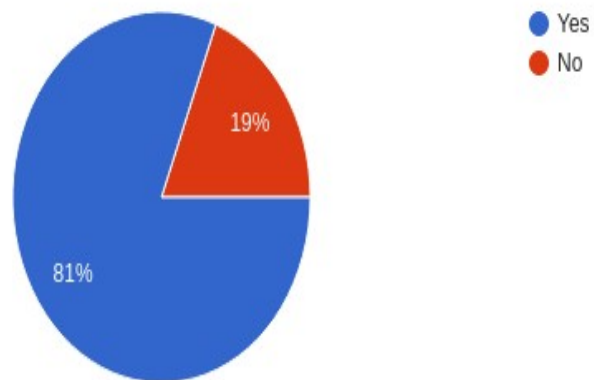
If i build a candy crush game will you use?

21 responses

From the above data, I could figure out, from 21 sample only 95.2% of them are using mobile to play a game and they play for an 1 to 2 hours a day. I could also find out that 95.2% use mobile to play game and 4.8% use laptop to play games. On top of that 81% has already played candy crush game and 19% has not played candy crush game. 85.7% will play my candy crush game if I build and 14.3% will not play my candy crush game.

From this data, the I could figure out that the majority of them prefer mobile game to play. Therefore the I concluded, development of android game of candy crush is feasible.

Flow chart
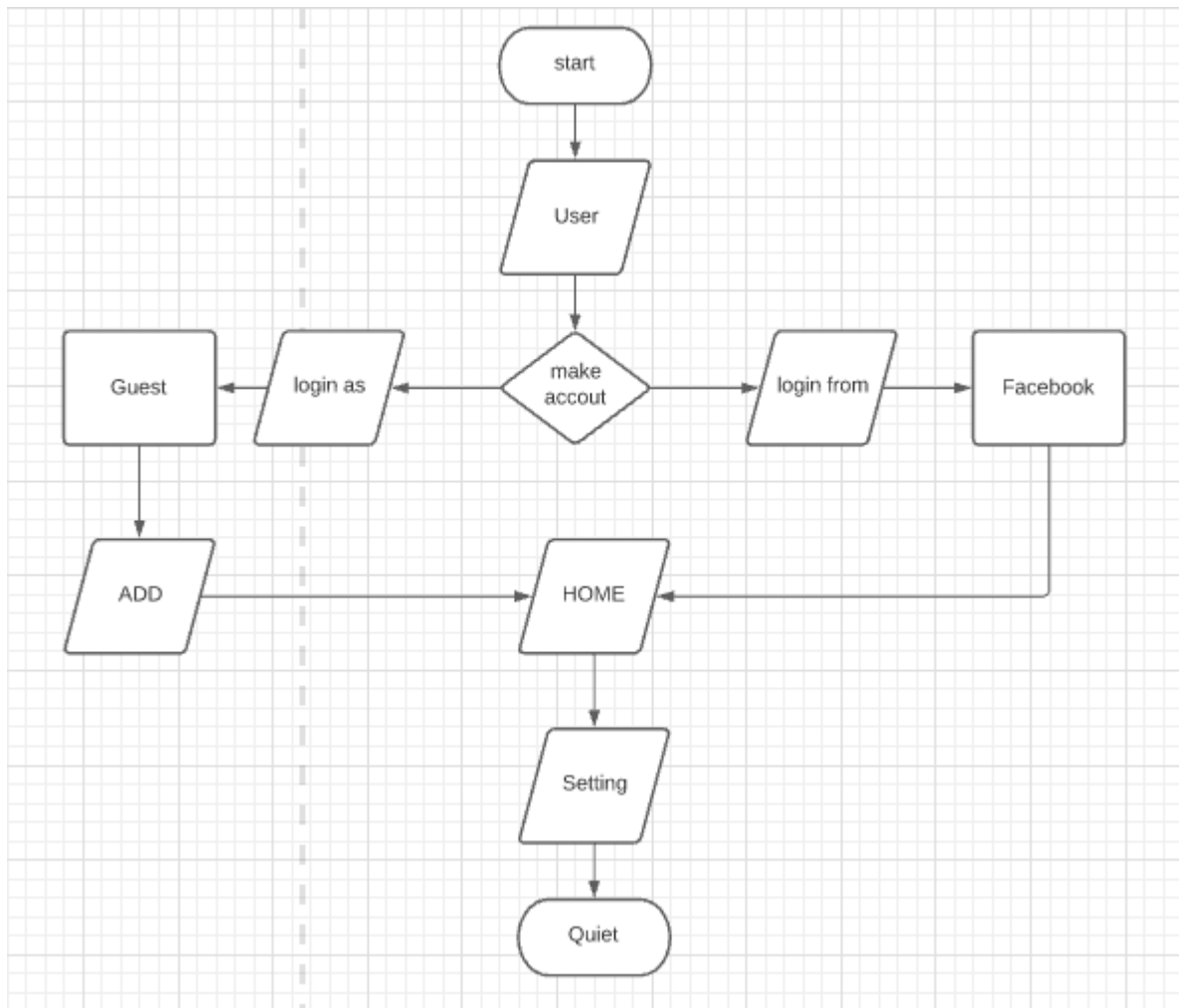
B   Project Team:

Title / Position	Number
Project Internal Guide	
Project External Guide	
Student Team Members	
Others (please specify)	
Add more rows if required	

C **Project Activities:**

(Please list and describe the main project activities, including those associated with the transfer of the research results to customers/beneficiaries. The timing and duration of research activities are to be shown in the Gantt chart in Section 8.)

Installation of software and tools:

- Installing android studio version (2 and above), Android SDK, Java Development Kit (v8 or more).

Sources from which we will be referring from:

- Referring books, video tutorials, online reference related to android app development, art programming language.

- Designing of user interface, database and of flow of the data by adapting numerous strategy.

- In the Development progress the design needs to be brought into existence through coding while making use of android framework.

- For the testing the developed product will be done unit testing to ensure that each unit performs dedicated functions properly before integration and then integration testing to ensure result function after combining all the units.

- In the Final documentation we will be completing all the required phases we would prepare the final documentation which consist of the report documentation and will be concluded with presentation.

D **Key Milestones and Deliverables:**

(Please list and describe the principal milestones and associated deliverables of the project. A key milestone is reached when a significant phase in the project is concluded, e.g. selection and simulation of algorithms, completion of architectural design and design documents, commissioning of equipment, completion of test, etc.) The timing of milestones is also to be shown in the Gantt chart in Section 8.

No.	Elapsed time from start (in months) of the project	Milestone	Days
	-	*Commencement of the project*	
1	09/02/2021 to 20/2/2021	Topic Selection	12
2	21/02/2021 to 13/03/2021	Literature Review	21
3	15/03/2021 to 25/03/2021	Requirement Gathering	11
4	26/03/2021 to 07/04/2021	Design	13
5	09/04/2021 to 02/05/2021	Coding	24
6	04/05/2021 to 15/05/2021	Testing	12
7	17/05/2021 to 24/05/2021	Final Documentation	8

(Please add more rows if required.)

5. **Benefits of the Project (Expected output/outcomes):**

   1. Good for health.

   2. Improve spatial skill.

   3. It help you to read and focus.

   4. Actively playing reduce fat.

   5. They ward off symptoms of depression.

   6. Good for kid too.

6. **Risk Analysis/Feasibility**

   A **Risks of the Project:**

   (Please describe the factors that may cause delays in, or prevent implementation of, the project as proposed above; estimate the degree of risk.)

(Please mark ☑ where applicable)	Low	Medium	High
Technical risk		☑	
Timing risk			☑
Budget risk	☑		

   A1. **Comments(Describe the risk):**

   Technical risk:

   For my project the technical risk is relatively medium as with the advancement in many upcoming technologies to carry out the project.

   Timing risk:

   The most challenging factor is the difficulties in completing project task on time.

   Budget risk:

   For our project we are making use of free software available online so budget risk is relatively low while developing our project.

7. Project Approval Certificate

(Approval of Project Proposal by the Competent Authority (Department Chairman) and Project Review Team is mandatory before the start of project execution.)

Project Review Team:

Sl #   Name   Signature

(Please add more rows if required.)

Project Coordinator

Name:

Designation:

Email:

Date: Signature:

Competent Authority – Head of Department
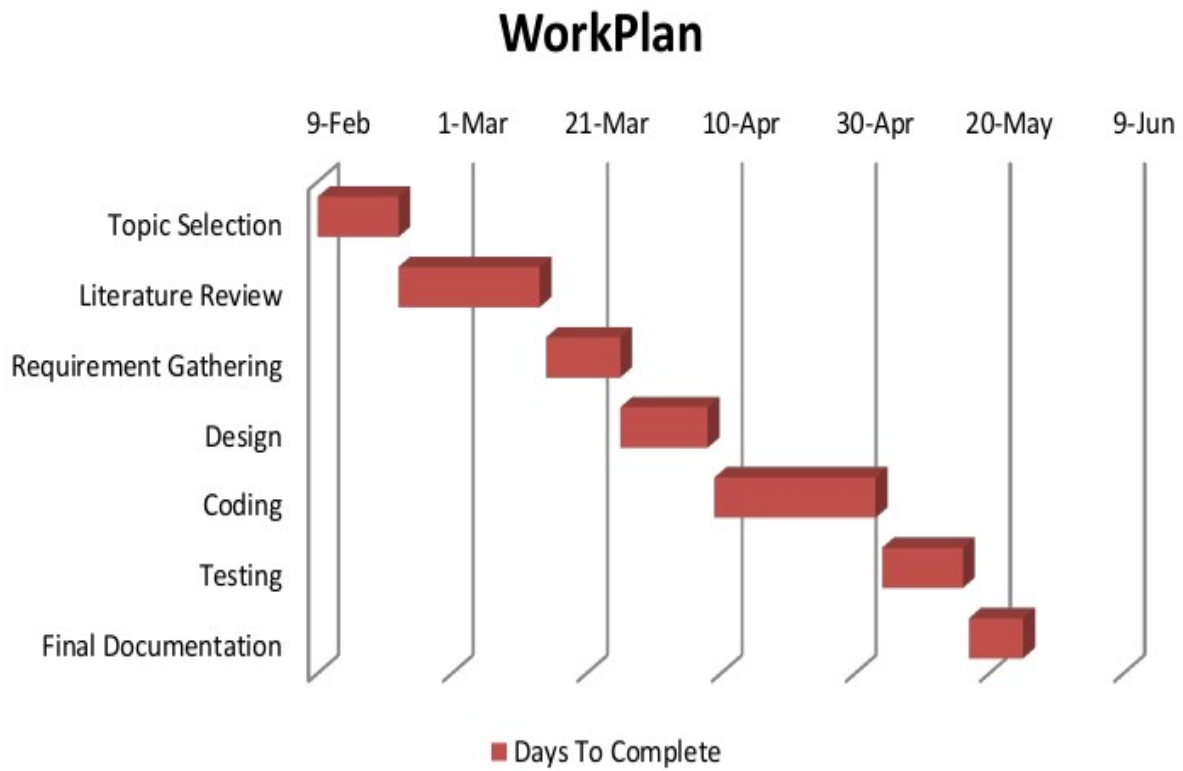
Name:

Designation:

Email:

Date: Signature

& stamp:

8. Reviewers Panel Comments

10. Project Schedule / Milestone Chart /Work plan

(Project schedule using MS-Project (or similar tools) with all tasks, deliverables, milestones, clearly indicated are preferred. Task should be measured in terms of hours)

13. Report Writing Guidelines

(Project report will be written under the specified guidelines.)

Bibliography

Chen, C., & Leung, L. (2016). Are you addicted to Candy Crush Saga? An exploratory study linking psychological factors to mobile social game addiction. *Telematics and Informatics*, *33*(4), 1155-1166.

Varonis, E. M., & Varonis, M. E. (2015). Deconstructing candy crush: what instructional design can learn from game design. *The international journal of information and learning technology*.

Karnsund, A. (2019). DQN tackling the game of candy crush friends saga: A reinforcement learning approach.

DE ALBENIZ, I. M. (2015). The Candy Project: the re-enchantment of candy in a liquid world. *ESSACHESS-Journal for Communication Studies*, *8*(02), 75-94.

Poromaa, E. R. (2017). Crushing candy crush: predicting human success rate in a mobile game using Monte-Carlo tree search.