The NUST Strategic Plan Game

Requirements Document

SEH620S

Mr. Steven Tjiraso

15 JANUARY 2021

Approver Name	Title	Signature
JUSTINE NDAMONA NAKALE 219053138	Group Representative	JN
VIJANDA VERIPI HERUNGA 216016681	Group Member	VH
VILHO NGUNO 219068208	Group Member	VN
VESTA NGOMBERUME 219085803	Group Member	VN
SHANIA NKUSI 219051704	Group Member	SN
MARTHA RABANUS 219064660	Group Member	MR

1. Introduction

1.1 Preface

The purpose of this document is to fully describe the nature of our game. This project targets users who would like to gain more knowledge and understanding of the NUST Strategic Plan. It includes mini games to enhance the understanding & grasps the concepts the plan has to offer. The document goes in depth about its functions, its users, and its requirements. It also reports on the interactions the user will have with the software.

1.2 Intended Audience

The intended audience of the game are the university's students and stakeholders.

1.3 Project Scope

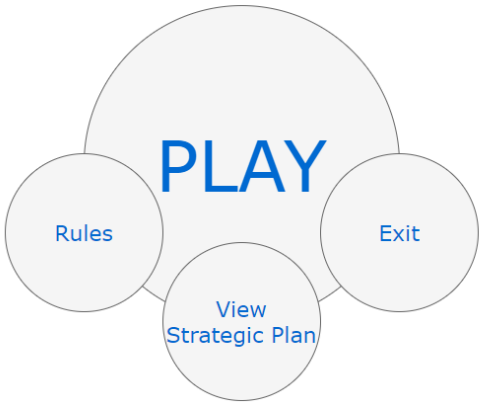
The purpose of the game is to ensure the university students are aware of the strategic goals and key performance indicators. The game allows students to steadily learn and grasp the concepts the game has to offer. In addition, the game lets the user, through multiple levels, maneuver it and aim for a comfortable user experience. The various levels will represent strategic goals and key performance indicators.

1.4 Glossary

Term	Definition
NUST	Namibia University of Science and Technology
KPI	Key Performance Indicators
GUI	Graphical User Interface

2. Overall Description

2.1 Product Perspective



The game will store the following information:

1. **Play –** this is where students will be able to test themselves to know if they understand the Strategic Plan through different levels.
2. **Rules –** will display all the rules concerning the game
3. **View Strategic Plan –** will display the NUST Strategic Plan so that the users will be able to read through it before they attempt to play the game.
4. **Exit –** will exit the game completely.
5. **Login -** the user will have to login using their student number before playing the game

2.2 Product Functions

The game will consist of 5 mini-games; **1. Crossword 2. Hangman 3. Finish the Sentence 4. Match the Word to the Meaning 5. Puzzle.**

The game is designed to help the stakeholders familiarize themselves with the strategic direction of the plan that NUST has put out. Each goal and its associated key performance indicators will be turned into a level on the game. The game will have 5 levels.

Level 1

It is based on goal one which is to build a vibrant and engaging learning environment, for the user to move on to level 2 they need to answer all six questions based on the key performance indicators as said on the document, if user does not answer all six question correctly, they must replay level 1 to move on to the next level.

Level 2

Level two is based on driving research, innovation, and supportive learning environment, for the user to move on to level 3 they need to answer all six questions based on the key performance indicators as said on the document, if user does not answer all six question correctly, they must replay level 2 to move on to the next level.

Level 3

Level three is based on strengthening stakeholder engagement, for the user to move on to level 4 they need to answer all six questions based on the key performance indicators as said on the document if user does not answer all six questions correctly, they must replay level 3 to move on to the next level.

Level 4

Level four is based on supplying leadership in governance and management, for the user to move on to level 5 they need to answer all six questions based on the key performance indicators as said on the document, if user does not answer all six question correctly, they must replay level 3 to move on to the next level.

Level 5

Level five is based on securing institutional stability, for the user to complete the game they need to win all five levels by answering all the questions on each level based on the key performance indicators as said on the document, if user does not answer all six question correctly, they must replay level 5 to complete the game.

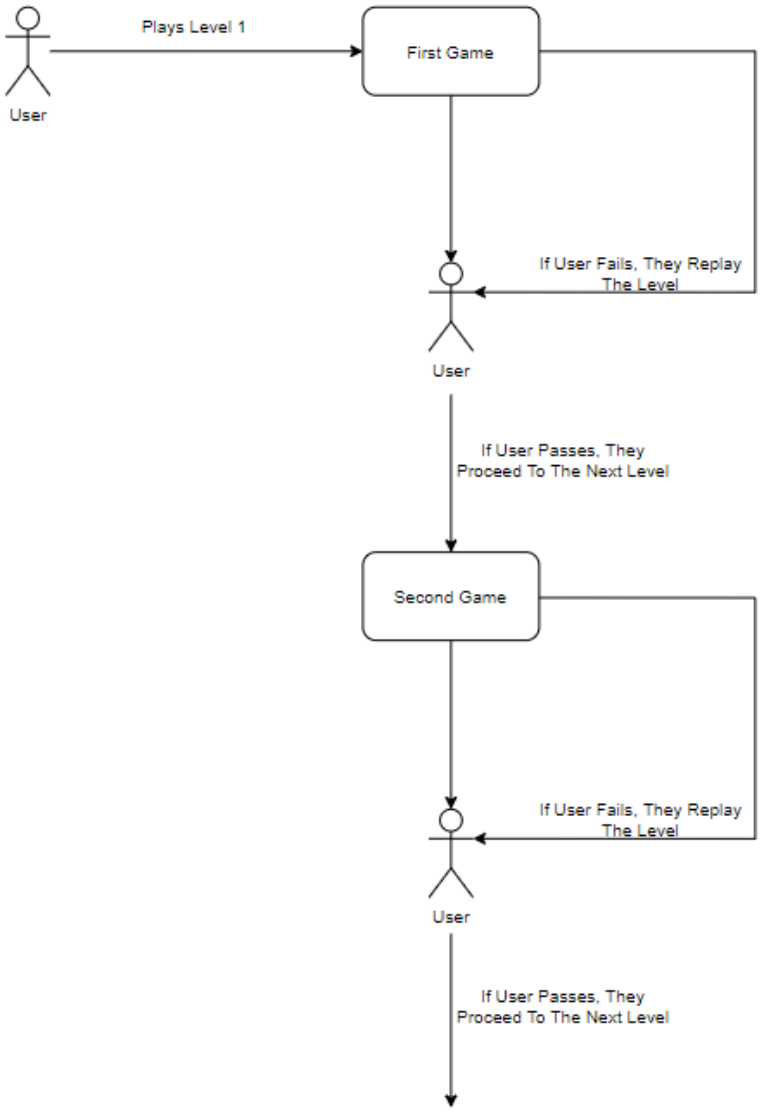
In order to be able to answer the questions, the user needs to read all the key performance indicators associated with the goal. The idea is to allow the stakeholders to be aware of the strategic plan, and that is executed by implementing a game design to the existing document, because reading a document can be tedious and boring. This ensures involvement, awareness, and contributions about the direction the university needs to take in order to reach their desired target to provide the best services to all the stakeholders involved.

2.3 System Models

There are four main perspectives, but we will only tackle two of the four perspectives, **Interaction Perspective and Behavioural Perspective**. They will help in understanding what the game will do in different views or perspective graphically.

2.3.1 Interaction Perspective

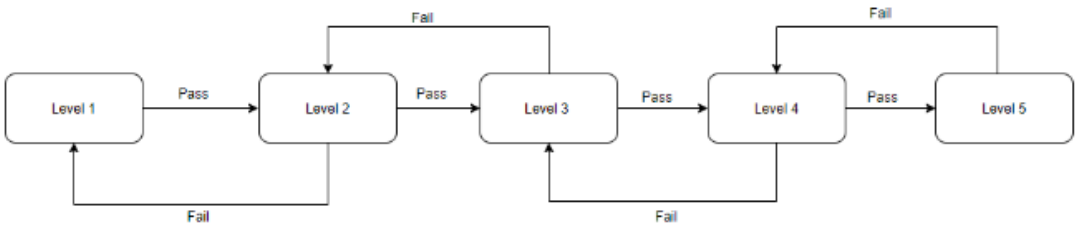
This interaction perspective will be based on when the user plays the game through its levels. The following diagram illustrates a brief interaction between the user and the game.



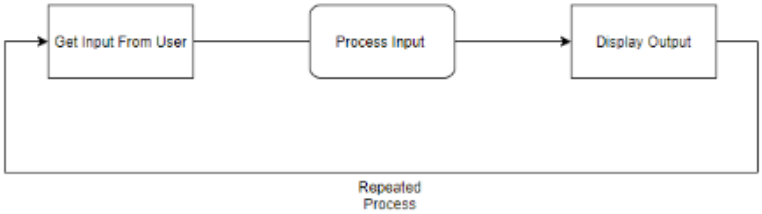
As the diagram above shows, when the user enters the game, he enters the game at Level 1 and makes way to the final level which is Level 5. You will be required to complete a level before proceeding to the next one. Each level will also have its own unique game.

2.3.2 Behavioural Perspective

This behavioural perspective will be based on when the user plays the game through its levels.



As stated in the Interaction Perspective, the user should pass its current level before proceeding to the next, and if the user happens to fail, they should repeat the level. In diagram above shows exactly that process. In addition, the diagram below shows a short and simple process of what the application does.



Since this game requires interaction with the user, it must gather input from the user before it can do anything. Once the game acquires the input, it processes it and then outputs it to the user and they decide what to do with that information. An example of this is if the user has to finish a sentence, and enters a letter/ word/ phrase, the game will process the input acquired and form a decision and display where the answer is correct or incorrect.

2.4 Assumptions, Risks and Constraints

2.4.1 Assumptions

- The game can be played at any time.
- It is not an online game.
- Levels have a time limit.
- The user will be given a couple of lives.
- After the user has run out of lives, they can be restored after a while.
- Students and staff can play the game provided they logged in successfully.
- It is a learning environment (educational).
- Compatible with all windows devices.

2.4.2 Risks

- Users may not be able to complete certain levels.
- Failing to load (stuck on a level), although the level has been complete.
- Coding may have errors.

2.4.3 Constraints

- Inefficient time to develop the game.
- The game should be played within a certain period.
- The game is only valid for the year 2021.

3. System Features

3.1 System Feature 1

Play

3.1.1 Description

This is where students will be able to test themselves to know if they understand the Strategic Plan. The button will operate as the start point of the game, where once clicked, will lead the user into the game.

3.1.2 Functional Requirements

- Button should be functional

3.2 System Feature 2

Rules

3.2.1 Description

A button that will display all the rules concerning the game.

3.2.2 Functional Requirements

- Button should be functional
- Should display the rules

3.3 System Feature 3

View Strategic Plan

3.1.1 Description

A button that will display the NUST Strategic Plan so that the users will be able to read through it before they actually attempt to play the game.

3.1.2 Functional Requirements

- Button should be functional
- Should display the Strategic Plan

3.4 System Feature 4

Exit

3.1.1 Description

A button that will exit the game completely.

3.1.2 Functional Requirements

- Button should be functional in leaving the application

3.5 System Feature 5

Level 1

3.1.1 Description

The first level will consist of the game Crossword, where the users have to fill the squares with letters, forming words/phrases relating to the strategic plan, solving clues, which lead to answers.

3.1.2 Functional Requirements

- Word/Phrase should only be formed by a continuous horizontal or vertical row of letters.
- There should be no blank spaces
- User should be able to enter a letter in each block

3.6 System Feature 6

Level 2

3.1.1 Description

The second level will consist of the game Hangman, where the user will have to guess the word/phrase which is related to the strategic plan, one letter at a time.

3.1.2 Functional Requirements

- User only has 6 attempts to finish the word/phrase
- User should be able to input data

3.6 System Feature 7

Level 3

3.1.1 Description

The third level will consist of the game Finish the Sentence, where the user must finish the sentence that they have been given using knowledge gained from the strategic plan.

3.1.2 Functional Requirements

- User should be able to input data
- User has a limited time to complete the game

3.6 System Feature 8

Level 4

3.1.1 Description

The fourth level will consist of the game Match the Word to the Meaning, where the user has to simply, match the given words to their meaning.

3.1.2 Functional Requirements

- User should be able to connect the words to their meanings

3.6 System Feature 9

Level 5

3.1.1 Description

The fifth level will consist of the game Puzzle, where the user must correctly arrange the photos displayed in the correct format.

3.1.2 Functional Requirements

- User should be able to click and drag photos around

4. Project Requirements

4.1 User Requirements

The following are the user requirements:

- Login to the game
- View rules of the game
- View the NUST strategic plan
- Able to exit the game
- Able to play the game and navigate through the levels/game

The requirements stated are necessary for the user to effectively navigate and play the game.

Since the game is highly dependent on user input, the following is the type of data required from the user:

- Their login details (which is just their student number)
- Answers to solve the questions in the game

4.2 System Requirements

The system is compatible on mostly any windows version. The system will also be interacting with the user, so it's expected to provide output to the user. The system will have to store information, so that once the user clicked "saved" when they return to the game they can continue from where they ended. It will also show once a level has been completed and you will be prompted to go to the next level or replay the completed level. If the level is not completed it will also show feedback.

Some of the non-functional requirements are response time, compatibility, usability, modifiability, running on 1024 MB RAM, and security.

5. External Interface Requirements

5.1 User Interfaces

The GUI of our application is user friendly, easy to navigate and no external assistance will be required. Gives quicker response as well as feedback to the user once they have completed a level, failed it or running out of lives. Navigation of the application will be done with mouse and keyboard combinations.

5.2 Hardware Interfaces

- Our software will be run on any devices running on windows operating system.
- The hardware should be able to run on the latest version of windows
- Has the ability to accept input from the user.
- Suitable for both keypad and touchscreen.

5.3 Software Interfaces

Software used for the strategic plan offline application:

Operating system	**We choose windows since it's the most user-friendly operating system. It is possible to run on all operating systems excluding iOS.**
Platform	To code our prototype and design our application we choose Pygame and/or Netbeans other suitable platforms.
Language Used	For the implementation we choose the python and java language for their features.

5.4 Communication Interfaces

[NONE]

6. Appendices

6.1 Functional Requirements

6.1.1 *Generating new grids.*

The crossword game will generate new crossword grid which can be found by clicking on the icon which is located on the above part of the GUI window.

6.1.2 *Save grid.*

The crossword game can be saved anywhere the user wants and can be accessed by clicking the above part of the GUI window.

6.1.3 *Exit*

The user can choose to quit the game

6.1.4 *Clear*

The user can erase all entries the made.

6.1.5 *Level selection*

The crossword game allows the user to play various levels in the game.

6.1.6 *About*

The user can get to know more about the games in each level by navigating to the above part of the GUI window and hover/click on the “Help” tab and click “About” for further information.

6.1.7 Rules

The user can view the rules of the game if they are unsure of how to play.

6.2 Non - Functional Requirements

- All the games can run on all the operating systems, ranging from Android to Linux to Windows. All excluding iOS.
- The application is available free of charge and is adaptable. It is extremely easy to use and this is due to the GUI.

- For security purposes, the software ensures that it is protected from unauthorized access to the system and its stored data. A log in system has been put in place for this security so no one else can access your account.
- The software is expandible and can add new features. Changing old ones is made easy.
- The maximum response time between the click and response time is one (1) second and the game can run a minimum of 1024 MB of RAM.

6.3 References

Functional and Nonfunctional Requirements: Specification and Types. (2018). Retrieved from

https://www.altexsoft.com/blog/business/functional-and-non-functional-requirements-specification-and-types/

Paschali, M., Ampatzoglou, A., Chatzigeorgiou, A., & Stamelos, I. (2014). Non-functional requirements that influence gaming experience: A survey on gamers satisfaction factors. *ResearchGate*. Retrieved from https://www.researchgate.net/publication/267633133_Non-functional_requirements_that_influence_gaming_experience_A_survey_on_gamers_satisfaction_factors

Gades. (2007). Non-Functional Requirements. Retrieved from https://app.assembla.com/wiki/show/tank_wars/Non-Functional_Requirements

User Requirements Document. (n.d.). Retrieved from http://www.c-jump.com/CIS75/Week06/samples/requirements.html

Eriksson, U. (2012 April 05). Why is the difference between functional and Non-functional requirements important? *ReQtest*. Retrieved from https://reqtest.com/requirements-blog/functional-vs-non-functional-requirements/

Usmani, F. (2020, July 26). Assumptions and Constraints in Project Management. *RM Study Circle*. - Retrieved from https://pmstudycircle.com/2012/10/assumptions-and-constraints-in-project-management/

Parker, J. (2012, February 18). Business, User, and System Requirements. Retrieved from https://enfocussolutions.com/business-user-and-system-requirements/

7. Gantt Chart

	PROJECT MANAGEMENT	PROJECT DURATION	PROJECT START DATE	PROJECT END DATE	
	GAMIFICATION OF NUST STRATEGIC PLAN		7 DECEMBER 2020	4 FEBRUARY 2021	
Task ID	Task Duration		Start Date	End Date	Resource Filler	ResourceName
User Requirement	17					
Introduction		2	12/7/2020	12/9/2020	12/9/2020	Vija,Vilho,Justine,Vesta,Shania,Martha
Overall Description		2	12/11/2020	12/13/2020	12/13/2020	Vija,Vilho,Justine,Vesta,Shania,Martha
System Features		4	12/14/2020	12/18/2020	12/18/2020	Vesta,Vija,Vilho,Justine,Shania,Martha
Project Requirements		4	12/18/2020	12/22/2020	12/22/2020	Vija,Vilho,Justine,Vesta,Shania,Martha
External Interface Requirements		4	1/8/2021	1/12/2021	1/12/2021	Martha,Justine,Shania,Vesta,Vilho,Vija
Appendices		1	1/13/2021	`14-Jan-21	1/14/2021	Vilho,Vija,Justine,Shania,Vesta,Martha
Working Prototype	21		1/15/2021	2/5/2021	2/5/2021	Vesta,Vija,Vilho,Justine,Shania,Martha
User Manual Requirement	21		1/15/2021	2/5/2021	2/5/2021	Martha,Justine,Shania,Vesta,Vilho,Vija
Final Product	14		2/5/2021	2/19/2021	2/19/2021	Vilho,Vija,Justine,Shania,Vesta,Martha