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2022

INFS 312 Semester Project

***STUDENTS RESIDENCE MAINTENANCE TRACKING SYSTEM***

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# Project team

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Role | Position | Contact Information |
| Mercy Mukulanga | Responsible for determining and documenting project scope, secure project sign-off and oversee change control. | Project Manager | mymukulanga@gmail.com |
| Jonathan Sithole | Responsible for researching, designing, implementing, managing software programs, testing and evaluating programs. | Head Developer | jtsithole@gmail.com |
| Amanda Chabvonga | Responsible for analysing how well the software, hardware and the wider IT fits the business needs of the employer and the client | System Analyst | akchabvonga@gmail.com |
| Thandeka Thwala | Responsible for conducting software programming through established design standards and write specifications to describe new content and consider feedback for documentation. | System Designer | tvthwalagmail.com |
| Dumisani Moshane | Responsible for researching, designing, implementing, and managing software programs, and testing and evaluating programs. | Head Programmer | dgmoshane@gmail.com |

# Team remarks

The northwest university aims to provide an environment that is conducive for both studying and the well-being of students. In order to achieve this goal the living areas for students need to be well maintained. Considering the current developments in technology it is no longer efficient to report issues by means of small notes and physical diary entries, the reporting of issues is a process which can easily be automated. The student’s residence maintenance tracking system aims to ensure that any and all issues relating to the maintenance of their living quarters are reported, tracked and handled efficiently.

# Preliminary investigation

# Introduction

We were presented with an opportunity to design a system that can solve a problem. We then decided to address the maintenance related problems that students and maintenance staff face within the Mafikeng campus focussing on the sol plaatjie residence of the north west university. Some of the identified problems are:

* Some of reported problems not reaching the warden
* Too many people are involved with the reporting of issues.
* Students wait for too long for issues to be addressed without knowing the progress on the report.
* There is no direct line of communication between students and the maintenance team.
* There is no accountability when reported issues are not attended to.
* There is no way of knowing when a reported issue will be addressed.
* Reported Issues are written on pieces of paper which are easily lost and very difficult to keep track of.

# Dfd

## Vision, values and mission of the North West University

Vision  
To be a pre-eminent University in Africa, driven by the pursuit of knowledge and  
innovation.

Values  
The North-West University subscribes to the values of human dignity, equality, freedom,  
integrity, tolerance, respect, commitment to excellence, scholarly engagement, academic  
freedom and justice.

Mission  
The NWU’s mission is to become a balanced teaching-learning and research university  
and to implement its expertise in an innovative way.  
This the institution will achieve as it lives its values, strives for sound management and  
pursues transformation, while being locally engaged, nationally relevant and internationally  
recognized.

## 

## Problem

North West University Mafikeng Campus has more than 12 on campus residences which house  
thousands of students. Issues of maintenance in these residences have been a problem for years  
now because reporting is not done in a reliable way. Students are asked to report issues to the respective block leaders who are then supposed to pass the request to the residence committee who then have to report it to the residence warden who is then supposed to report the issues to the maintenance department. This process is tedious and has left many issues critical to the safety and wellbeing of students unattended in on campus residences due to the lack of adequate record keeping, accountability with regards to getting back to students and resolving the reported grievances. These issues do not show the commitment to excellence which is mentioned under the NWU vision and mission and needs to be resolved.

## Dfd

## Proposed Solutions

#### Solution 1: Devices for reporting maintenance issues installed within residences.

This solution would entail having to purchase devices and developing a system for the reporting of issues which will work on the specific device then installing the device at specific points within the residences.

#### Solution 2: An online system for reporting and tracking maintenance issues at Northwest University (Mafikeng) for Sol Platjie Residence

This solution would entail creating a simple platform which will work on any device to report and track any maintenance related issues which need to be addressed within the Sol Platjie Residence.

## Best Solution

An online system for reporting and tracking maintenance issues at Northwest University (Mafikeng) for Sol Platjie Residence.

The system is built to help students and staff members within the Mafikeng Sol Platjie Residence to report and track maintenance related issues. Currently the reporting of issues is done by means of writing on pieces of paper which is not effective because it can be difficult to keep track of. Using the system each student within residence will have a simple platform which will work on any device to report and track any maintenance related issues which need to be addressed within their rooms, and the respective block leaders can report maintenance issues with regards to the shared areas. All this information will then be stored in a database where the staff at maintenance can easily access it and minimize the amount of people reporting the same issues as well as keeping a record of which items were repaired or replaced and when this was done. Not only will this save the institution money but it will save time as well. Each reported issue will specify the residence, block, room as well as the information of the occupant of the room. The maintenance side all the reported issues will be sorted and categorized through the use of a dashboard which shows all the number of appliances that need to be replaced in total and all other maintenance issues, making it easier to issue work orders to have these issues resolved. This system will be easy to use and require minimal training on its use while optimizing a tedious process and making both the students and staff happy

### Objectives of the system

* The system should work on any cellular, laptop or desktop device
* System should allow users to log in using their NWU credentials

### Objectives: Students

* The System should provide an interface which allows students to report and track maintenance issues within their respective rooms.
* The system should allow the block leaders to report issues with their respective blocks common areas.
* The system should store information in a database which can be accessed by the team at maintenance
* System should provide a way for progress to be tracked for the reported issue and alert students about maintenance date and time

### Objectives: Residence staff and Maintenance

* The system should provide an interface where reported issues can be sorted in terms of residence and maintenance issue type.
* The system should make use of a dashboard to show all the reported issues after they have been sorted and categorised
* the system should provide an interface where students can be informed of when the maintenance team will come to resolve reported issues.

Project integration management

## Swot Analysis

|  |  |
| --- | --- |
| Strengths | Weaknesses |
| * The system is accessible anytime * Displays reports status. * Reports can be easily tracked. * No need to go in person to report issues. * Flexibility as reports can be issued anytime. * Saves time. * User friendly. * Use of a dashboard for data analytics. | * Fake reports can be issued. * A report cannot be seen if the student does not click submit even if they save. * The system is not user specific, designed for on campus students only but off campus students can access it. * Even if the system is accessible anytime, maintenance workers do not work 24 hours. |
| Opportunities | **Threats** |
| * Different applications that work on various devices can be developed. * Job opportunities as the system does not exist on the University | * Connectivity issues e.g. when the internet is down. * Several more established competitors. * Potential users refusing to use the system as it is something new. |

## Method of selecting the project

### NPV calculation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Year | 1 | 2 | 3 | Total |  |
| Costs | 200,000 | 30,000 | 30,000 |  |  |
| Discount Factor | 0.91 | 0.83 | 0.75 |  |  |
| Discounted Costs | **182,000** | **24,900** | **22,500** | **229,400** |  |
|  |  |  |  |  |  |
| Benefits | 0 | 160,000 | 160,000 |  |  |
| Discount Factor | 0.91 | 0.83 | 0.75 |  |  |
| Discounted Benefits | **0** | **132,800** | **120,000** | **252,800** |  |
|  |  |  |  |  |  |
| Discounted Benefits-Costs | -182,000 | 107,900 | 97,500 | **23,400** | **NPV** |
| Cumulative Benefits-Costs | -182,000 | -74,100 | 23,400 |  |  |
|  |  |  |  |  |  |
| ROI = 10% |  |  |  |  |  |

## Project Charter

|  |
| --- |
| Project Title: Student Residence Management System  Date of Authorization: February 22  Project Start Date: 06 March 2022 Project Finish Date: 14 November 2022  Project Manager: Mercy Mukulanga  0734830286/0782891057  [mercymukulaga@gmail.com](mailto:mercymukulaga@gmail.com)  Budget Information: The estimated budget that has been allocated for the project is R120 000 and more funds will be available if needed, most costs are going to be incurred during the coding activities as most software will be outsourced.  Purpose: To help students and staff members within the Mafikeng Campus with maintenance issues and capturing of data that has to do with these issues.  Main Project Success Criteria: The System should meet all its stipulations, be exhaustively tested and be completed on the scheduled time.  Description: Design and develop a system that can assist students with their residence maintenance problems.  Objective   * Create a system that works on any cellular, laptop or desktop device. * System should provide an interface which allows students to report maintenance issues within their respective rooms. * System should store information in a database which can be accessed by the team at maintenance. * System should make use of a dashboard to show all the reported issues after they have been stored and categorised.   Deliverables: Project management- related deliverables: Business case, project charter, scope statement, Work Breakdown Structure, schedule, cost baseline, progress reports, final project presentation, final project report, lessons-learned report, and any documents that will be needed to make sure the project is done and complete. |
| ROLES AND RESPONSIBILITIES   |  |  |  |  | | --- | --- | --- | --- | | Name | Role | Position | Contact Information | | Mercy Mukulanga | Responsible for determining and document project scope, secure project sign-off and oversee change control. | Project Manager | mymukulanga@gmail.com | | Jonathan Sithole | Responsible for researching, designing, implementing, and managing software programs, and testing and evaluating programs. | Head Developer | jtsithole@gmail.com | | Amanda Chabvonga | Responsible for analysing how well the software, hardware and the wider IT fits the business needs of the employer and the client | System Analyst | akchabvonga@gmail.com | | Thandeka Thwala | Responsible for conducting software programming through established design standards and write specifications to describe new content and consider feedback for documentation. | System Designer | tvthwalagmail.com | | Dumisani Moshane | Responsible for researching, designing, implementing, and managing software programs, and testing and evaluating programs. | Head Programmer | dgmoshane@gmail.com |   Key Stakeholders Sign Offs  MY Mukulanga JT Sithole  AK Chabvonga TV Thwala  DG Moshane  Comments  “My main goal is to make sure that everyone adheres to the project goals and assist to make sure it succeeds” – Mercy Mukulanga  “If you need any assistance do not hesitate to contact me” - Dumisani Moshane |

## Project Management Plan

### Overview

#### Purpose

To create a Residence maintenance system which provides each student within residence with a platform to report any maintenance issue which needs to be addressed.

#### Objectives

* The system should work on any cellular, laptop or desktop device
* System should allow users to log in using their NWU credentials
* The System should provide an interface which allows students to report maintenance issues within their respective rooms.
* The system should allow the block leaders to report issues with their respective blocks.
* The system should store information in a database which can be accessed by the team at maintenance
* System should provide a way for progress to be tracked for the reported issue and alert students about maintenance date and time
* The system should provide an interface where reported issues can be sorted in terms of residence and maintenance issue type.
* The system should make use of a dashboard to show all the reported issues after they have been sorted and categorised
* the system should provide an interface where students can be informed of when the maintenance team will come to resolve reported issues.

### Project Organisation

#### Internal structure

|  |  |  |  |
| --- | --- | --- | --- |
| Role | Name | Signature | Date |
| Project Sponsor | NWU |  | 04/05/2022 |
| Project Review Group | Mrs L. Ditibane |  | 13/11/2022 |
| Project Manager | Mercy Mukulanga | Mukulanga | 04/05/2022 |

### Project Management Process Plan

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Phase | Key Activities | Criteria Inputs | Criteria Outcome | Development Approach |
| Initiation | -Develop a project charter.  -Develop preliminary project scope statement | -Project Statement of work  -Business Case  -Environmental Factors  -Organizational process assets | Project Charter | Agile development |
| Planning | -Develop a project management plan | -Project Charter | Project Management Plan | Agile development |
| Executing | -Direct and manage project execution | -Project management plan  -Approved change request  -Enterprise Environmental Factors  -Organizational process assets | Project Deliverables | Agile development |
| Controlling | -Monitor and Control project work  -Integrated change control | -Project management plan  -Work performance information  -Enterprise environmental factor  -Organizational process assets  -Validated changes | Change Requests and Status Update | Agile development |
| Closing | -Project presentation | -Project Management Plan  -Accepted Deliverables  -Organizational Process Assets | Final Product/Phase | Agile development |

### Technical Process Plan

#### Tools and Techniques

* Expert Judgement
* Data Gathering
* Interpersonal and team skills
* Project Management Information System
* Data Analysis
* Decision Making
* Change Control Tools
* Meetings

# Project scope management

## Project Scope Statement.

### Overview

For many years the students residing on campus in the Mafikeng campus of the North West University have battled with the reporting and following through of maintenance issues. The residence maintenance management system aims to eradicate the backlog of past issues as well as improve efficiency with maintenance related issues by up to 50%. Its aim is to provide a platform which is easily accessible as well as transparent between the maintenance team and the affected students thus minimizing the risk of possible injury due to negligence on the part of the institution as well as improving the safety and wellbeing of the students housed on-campus by ensuring that all on campus facilities are safe and well maintained.

### Key objectives of the residence maintenance management system.

|  |  |
| --- | --- |
| Objective | Implementation plan |
| * Create a system that works on any cellular, laptop or desktop device. | The system will be web based making it easily accessible on a range of devices |
| * System should provide an interface which allows students to report maintenance issues within their respective rooms. | The system will make use of existing databases within the residence department and allow users to log in with their NWU credentials thereby making it easy to categorise reports by the respective block and room of the user. |
| * System should store information in a database which can be accessed by the team at maintenance. | After the user logs an issue the issue will then be saved on a database which will be used to categorise reports by type and urgency |

### Key role players for scope management

Project Manager: Determine and document project scope, secure project sign-off and oversee change control.

Project Sponsor: Formally accepts project scope statement, baseline, and products.

Change Controller: Manages change control process, co-ordinates evaluation of change requests and organizes change control meetings.

### Major deliverables for scope management

* Project scope statement
* Work Breakdown Structure
* Project schedule plan
* Requirements management plan

## Scope management plan

Actual and planned performance can be compared using variance analysis, and if changes are needed, change request forms will be submitted to the change control board (which includes the Project Manager, Project Sponsor, Verifier, Evaluator, and other stakeholders), who will decide whether to approve or reject the changes. The project scope will serve as a benchmark against which the initial project approval will be measured. Changes to the overall project scope will be measured and monitored by the change management board.

### Likelihood of changes to the project scope

Although changes to the scope are to expected in order to ensure that the idea can be made better and easier to implement, the initial scope will remain the same in order to ensure that the project meets the planned budget and is completed within the indicated time frame. All scope changes will be implemented in an update to the planned system in future.

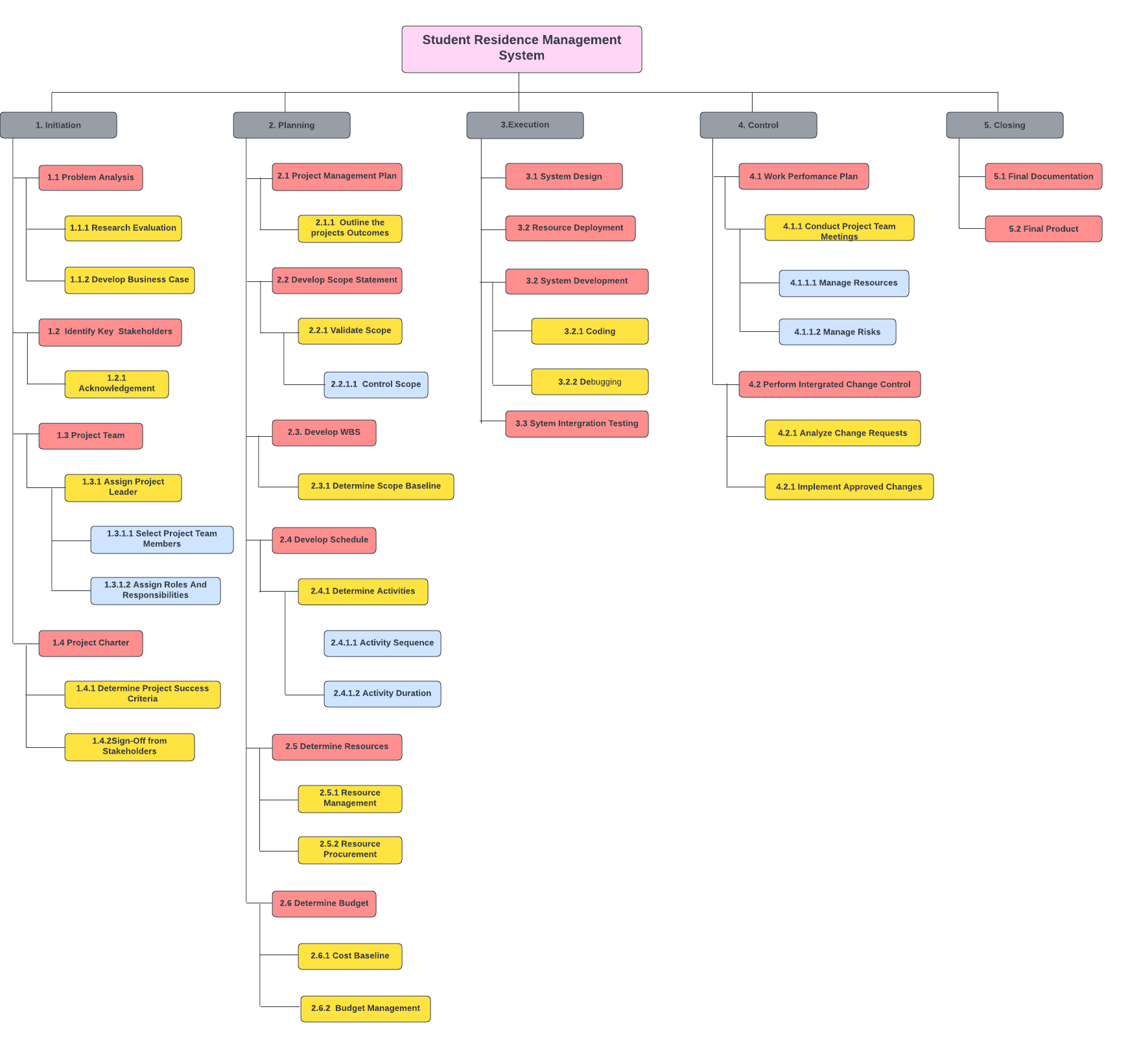
### Changes in the scope

* Any project stakeholder, such as the user, project sponsor, or project manager, can identify a scope change.
* A change in scope can be linked to resources, timelines, technicalities, or risk mitigation.
* A unique ID, description, Date submitted, impact, priority and impact area attributes will be assigned to each scope change.
* The change scope will have a status assigned to it such as requested, approved, in process or closed
* If changes are approved, the following must be updated:
  + Project Plan
  + Project Schedule
  + Project WBS
  + Project Baseline

## Project Requirements

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Requirement | Description | Category |
| 1 | System must be able to work with all types of software and hardware. | Software for example could be android, IOS, windows etc. Hardware for example cell phones, tablets, laptops etc. | Business |
| 2. | The system requires a login page | Users will have to use their university credentials in order to access the system. | Technical |
| 2 | Users should be able to report issues, track and receive feedback. | The initial solution of the project must be operational without failure. | Technical |
| 3. | The system requires database. | Data must be stored and accessed on and from a certain database. | Business |
| 4 | The system requires a dashboard. | * Data must be visualised to provide a clear picture on how everything is going. | Business |
| 5. | The system must be user friendly. | The system must be easy and understandable for the users. | Business |
| 6. | The system must show the report status. | Users must be able to track the maintenance issues they report. | Technical |
| 7. | New System Tutorial | Users must attend a tutorial on how to use the new system. | Business |
| 8. | Security measures | The system must guarantee protection and privacy of users. | Technical |
| 9. | The System must be reliable | The system is expected to meet the needs of the users. | Business |
| 10. | Consistency | The system is expected to work all the time. | Technical |
| 11. | Time frame | The system should be done before the end of November 2022 and ready to be used. | Business |

## Work Breakdown Structure



## Work Breakdown Structure Dictionary

|  |  |  |
| --- | --- | --- |
| WBS Item Number | WBS Item Name | Description |
| 1.2 | Key stakeholders | Members of a corporation who are most directly involved in the project. |
| 1.3 | Project Team | A group of people who collaborate to achieve a common project goal. |
| 1.4 | Project Charter | A document that formally acknowledges a project's existence. |
| 2.2. | Scope Statement | All aspects of the project scope are defined, including project requirements, assumptions, and acceptance criteria. |
| 2.4 | Schedule | A plan for carrying out a process. |
| 3.2 | Resource Deployment | Involves part of a bigger system that drives the company's daily operations and growth. |
| 3.3 | Coding | The process of converting ideas, solutions, and instructions into a computer-readable language. |
| 2.6 | Budget | An income cost estimate for a given item over a period of time. |
| 2.3.1 | Scope Baseline | The authorized project scope statement, as well as the WBS and WBS dictionary that go with it. |
| 3.2.1 | Debugging | Process of identifying and removing errors from a code. |
| 4.2 | Integrated Change Control | Identifying, assessing, and managing changes during the course of a project's life cycle. |
| 4.1 | Performance Plan | A document that formally explains all of the objectives established. |

## Project Scope Baseline

**Project Scope Baseline**

**Project Title:** Student Residence Management Systems

**Date: 06/05/2022**

|  |
| --- |
| **Scope Description:**  Investigation and analysis  Preparation of Proposal  Development of Project Charter |
| **Major Deliverables:**  Collect Requirements  Project documentation  Perform Integrated Change Control  Resource deployment  Defining project scope  Create Schedule and WBS  Procurement of missing resources  Validate and Control Scope  Schedule Control  Documentation of lesson learned |
| **Assumptions:**  Project budget Estimate  Develop procurement and Risk management plan |
| **Constraints**:  Debugging  Close project |

# Project schedule management

## Project Schedule Management Plan

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Activity | Phase | Task | Start Date | Finish Date |
|  | **Initiation** |  |  |  |
| A |  | **i)** Investigation of an idea. | 06-03-2022 | 14-03-2022 |
| B |  | **ii)** Preparation of the Business Proposal. | 14-03-2022 | 16-03-2022 |
| C |  | **iii)** Development of a Project Charter. | 17-03-2022 | 24-03-2022 |
|  | **Planning** |  |  |  |
| D |  | iv)Collect Requirements | 25-03-2022 | 28-03-2022 |
| E |  | **v)**Project Documentation | 29-03-2022 | 30-05-2022 |
| F |  | **vi)**Define project scope | 30-03-2022 | 05-04-2022 |
| G |  | **vii)** Creating the project schedule and WBS. | 05-04-2022 | 23-04-2022 |
| H |  | **viii)**Create an Estimate of the Project Budget | 16-05-2022 | 27-05-2022 |
| I |  | **ix)** Create a Risk Management plan | 19-05-2022 | 24-05-2022 |
|  | **Execution** |  |  |  |
| J |  | **x)** Resource Procurement | 03-06-2022 | 20-06-2022 |
| K |  | **xi)** Resource Deployment | 24-06-2022 | 01-07-2022 |
| L |  | **xii)**Coding | 02-07-2022 | 25-09-2022 |
| M |  | **xiii)**Debugging | 26-09-2022 | 30-09-2022 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Monitoring and Controlling |  |  |  |
| N |  | **xiv)**Validate and Control Scope | 29-03-2022 | 29-10-2022 |
| O |  | **xv)**Schedule Control | 06-04-2022 | 30-10-2022 |
| P |  | **xvi)**Budget Control | 04-05-2022 | 30-10-2022 |
| Q |  | **xvii)**Testing | 04-10-2022 | 28-10-2022 |
| R |  | **xiv)** Perform Integrated Change Control | 25-03-2022 | 30-10-2022 |
|  | **Closing** |  |  |  |
|  |  | **xv**) Document lessons learnt | 02-11-2022 | 11-11-2022 |
|  |  | **xvi)** Presentation of the Final Project | 13-11-2022 | 14-11-2022 |
|  |  | **xvii) Close the project** | 13-11-2022 | 14-11-2022 |

## Milestone list

|  |  |
| --- | --- |
| Project Name | Student Residence maintenance management system |
| Project Manager | M. Mukulanga |
| Date | 06-03-2022 |

|  |  |  |  |
| --- | --- | --- | --- |
| Milestone title | Milestone Description | Milestone type | Date if applicable |
| Project kick off meeting | the first meeting with the project team and the project stakeholders. This meeting is used to establish common goals as well as the purpose of the project. | mandatory | 06-03-2022 |
| Preliminary Investigation | The purpose of the preliminary investigation is to determine whether there is a problem or deficiency in the current system and make decisions on how to correct these problems, this includes:   * Identifying problems * Proposing solutions * Identifying approaches to solving the problem * Outlining the success criteria | mandatory | 12-03-2022 |
| Data Analysis | the use of past and current project data to enable effective decisions on project delivery. This includes:   * Project charter * Project scope management plan * Project requirements * Swot analysis | mandatory |  |
| Feasibility Study | A feasibility study evaluates the practicality of your project plan in order to judge whether or not you're able to move forward with the project. A way to evaluate whether or not the project plan will be successful. | mandatory |  |
| System Planning | The development of a schedule, resource plan, and budget for project activities to ensure project success. This includes:   * Project management plan * Work breakdown structure * Project schedule * Gantt charts * Project costs | mandatory |  |
| System Analysis | System analysis is conducted for the purpose of studying a system and its parts in order to identify its objectives. It is used to improve the system and ensures that all the components of the system work efficiently to accomplish their purpose. | mandatory |  |
| System design | The purpose of System Design is to create a technical solution that satisfies the functional requirements for the system | mandatory |  |
| Project presentation | Presentation of the final project to all the project stakeholders | mandatory |  |

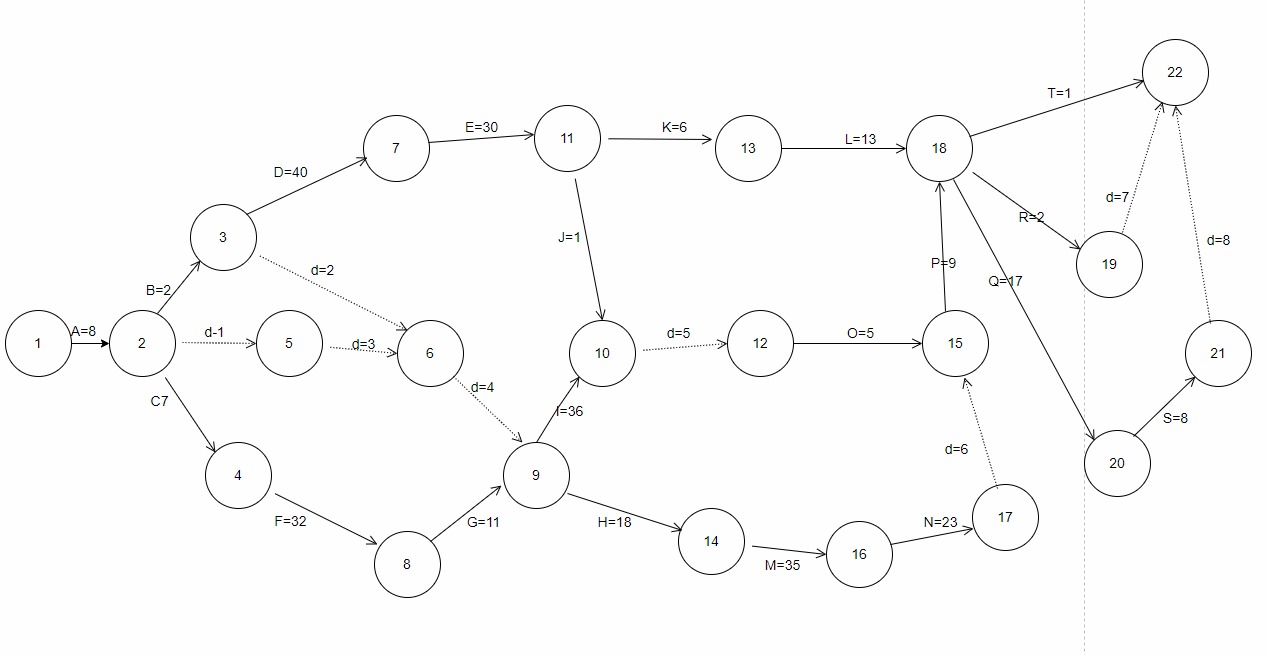
## Project Activity List

|  |  |  |  |
| --- | --- | --- | --- |
| Activity Identifier | Phase | Activity Name | Activity Description |
|  | **Initiation** |  |  |
| A. |  | Investigation of an idea | Documenting proposals for future research. |
| B. |  | Preparation of a Business Proposal | Creating a problem statement, a potential solution, and pricing information for the organization. |
| C. |  | Development of a Project Charter | Creating a document that acknowledges the project's existence |
|  | **Planning** |  |  |
| D. |  | Collect Requirements | Fulfilling project objectives, determine, document, and manage stakeholder needs and requirements. |
| E. |  | Project Documentation | Recording important project details and creating the paperwork needed to properly implement it. |
| F. |  | Define Project Scope | Identifying the specific goals, timelines, and project deliverables that will be pursued. |
| G. |  | Creating the project schedule and WBS | Defining and tracking a project deliverable, as well as all the minor pieces that go into making it. |
| H. |  | Create an estimate of the project budget | Predicting a project's total cost by precisely defining its scope of work. |
| I. |  | Create Risk Management Plan | Identifying potential project hazards, estimating their impact and the likelihood of them occurring. |
|  | **Execution** |  |  |
| J. |  | Resource Procurement | Developing and maintaining the external relationships required to finish a project. |
| K. |  | Resource Deployment | Increasing resource use across the organization. |
| L. |  | Coding | Putting ideas, solutions, and instructions into a computer-friendly language. |
| M. |  | Debugging | Detecting and eliminating problems in the code. |
|  | **Monitoring and Controlling** |  |  |
|  |  | Validate and Control Scope | Accepting the finished project deliverables in writing and keeping track of the project's and product's progress. |
|  |  | Schedule Control | Monitoring the project's activities and tasks to verify that it is running well. |
|  |  | Budget Control | Budget management. |
|  |  | Testing | Providing details about the product as well as the first developer input. |
|  |  | Perform Integrated Change Control | Reviewing and approving all change requests, as well as managing and communicating changes to deliverables, project documents, and the project management plan. |
|  | **Closing** |  |  |
|  |  | Document Lessons Learned | Throughout the lifecycle of a project, collecting survey data and team member input. |
|  |  | Presentation of the Final project | Presenting the completed product that meets all of the goals |
|  |  | Close the Project | Project completion and closing |
|  |  |  |  |

## Gantt Chart

Please find the attachment below



Arrow diagramming Diagram

## Critical Path

There 32 different paths which can be taken

1. A-B-D-E-K-L-T: 8+2+40+30+6+13+1 = 100 days
2. A-B-D-E-K-L+R+d=7: 8+2+40+30+6+13+7 = 106 days
3. A-B-D-E-J-d=5-O-P-T: 8+2+40+30+1= 81 days
4. A-B-d2-E-d3-K-L-d6: 9+4+9+80+10= 112 days
5. A-B-d2-E-d3-K-M-N-d7: 9+4+9+80+26+1= 129 days
6. A-B-d2-E-d3-G-d4-O: 9+4+9+12+1=35 days
7. A-B-d2-E-d3-G-d4-L-d6: 9+4+9+12+10= 44 days
8. **A-B-D-E-K-L+Q+S+d=8: 8+2+40+30+6+13+17+8+8= 132 days**
9. A-B-d2-E-d3-G-d4-M-N-d7: 9+4+9+12+26+1= 61 days
10. A-B-d2-E-H-I-d4-O: 9+4+9+8+21+1= 52 days
11. A-B-d2-E-H-I-d4-L-d6: 9+4+9+8+21+10= 61 days
12. A-B-d2-E-H-I-d4-M-N-d7: 9+4+9+8+21+26+1= 78 days
13. A-B-d2-E-H-J-d5-O: 9+4+9+8+7+1= 38 days
14. A-B-d2-E-H-J-d5-L-d6: 9+469+8+7+10= 47 days
15. A-B-d2-E-H-J-d5-M-N-d7: 9+4+9+8+7+26+1= 64 days
16. A-d1-E-d3-K-O: 9+9+80+1= 99 days
17. A-d1-E-d3-K-L-d6: 9+9+80+10= 108 days
18. A-d1-E-d3-K-M-N-d7: 9+9+80+26+1= 125 days
19. A-d1-E-d3-G-d4-O: 9+9+12+1= 31 days
20. A-d1-E-d3-G-d4-L-d6: 9+9+12+10= 40 days
21. A-d1-E-d3-G-d4-M-N-d7: 9+9+12+26+1= 57 days
22. A-d1-E-H-J-d5-O: 9+9+8+7+1= 34 days
23. A-d1-E-H-J-d5-L-d6: 9+9+8+7+10= 43 days
24. A-d1-E-H-J-d5-M-N-d7: 9+9+8+7+26+1= 60 days
25. A-d1-E-H-J-I-d4-O: 9+9+8+21+1= 48 days
26. A-d1-E-H-J-I-d4-L-d6: 9+9+8+21+10= 57 days
27. A-d1-E-H-J-I-d4-M-N-d7: 9+9+8+21+26+1= 74 days
28. A-C-D-d3-K-O: 9+9+4+80+1= 103 days
29. A-C-D-d3-K-L-d6: 9+9+4+80+10= 112 days
30. A-C-D-d3-K-M-N-d7: 9+9+4+80+20+1= 129 days
31. A-C-D-d3-G-d4-O: 9+9+4+12+1= 35 days
32. A-C-D-d3-G-d4-L-d6: 9+9+4+12+10= 44 days

Therefore, the shortest possible time to complete the project will be the critical path which is path number eight (8) which takes 132 days

# Project cost management

## Cost Management Plan

It shows how everything will be measured.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Units of Measure | Level of Accuracy | Control Thresholds | Reporting Formats | Process Descriptions |
| * The currency that is going to be used is Rand. * Each working day consists of 8 hours * 5 working days a week. | * Activity cost estimate will be rounded to 2 decimal places | * Our overall budget can be +/- 20% of the total estimated budget | * Costs will be recorded monthly. * Reports on updates will be in a form of a Power-point presentation | * Costs will be tracked on a monthly basis. |

## Cost estimate model

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | #Units/ hours | Cost/unit/hour | subtotals | WBS Level 2 totals | % of total |
| WBS items |  |  |  |  |  |
| 1.       Project management |  |  |  | 46880 | 32.31 |
| Project manager | 800 | 25 | 20000 |  |  |
| Project team | 1344 | 20 | 26880 |  |  |
| 2.       Hardware |  |  |  | 8400 | 5.79 |
| Server upgrade | 168 | 50 | 8400 |  |  |
| 3.       software |  |  |  | 32000 | 22.05 |
| Outsourced software |  |  | 2000 |  |  |
| software development |  |  | 30000 |  |  |
| 4. testing (15% hardware and software costs) |  |  |  | 6060 | 4.18 |
| 5. training and support |  |  |  | 28580 | 19.70 |
| training cost | 20 | 85 | 1700 |  |  |
| project team members | 1344 | 20 | 26880 |  |  |
| subtotals |  |  | 115860 |  |  |
| reserves (20% of total estimate |  |  |  | 23172 | 15.97 |
| total project cost estimate |  |  |  | 145092 |  |

## Cost baseline

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Month 1 | Month 2 | Month 3 | Month 4 | Month 5 | Month 6 | Month 7 | Month 8 | Month 9 | Totals |
| WBS Items |  |  |  |  |  |  |  |  |  |  |
| 1. Project Management |  |  |  |  |  |  |  |  |  |  |
| 1.1 Project Manager | 1,777.80 | 1,777.80 | 1,777.80 | 1,777.80 | 1,777.80 | 1,777.80 | 1,777.80 | 1,777.80 | 1,777.80 | 16,000 |
| 1.2 Project Team | 2,240 | 2,240 | 2,240 | 2,240 | 2,240 | 2,240 | 2,240 | 2,240 | 2240 | 20,160 |
| 2. Hardware |  |  |  |  |  |  |  |  |  |  |
| 2.1 Server Upgrade |  |  | 8000 |  |  |  |  |  |  | 8,000 |
| 3. Software |  |  |  |  |  |  |  |  |  |  |
| 3.1 Outsourced Software |  |  | 285.70 | 285.70 | 285.70 | 285.70 | 285.70 | 285.70 | 285.70 | 2,000 |
| 3.2 Software Development |  |  | 4285.70 | 4285.70 | 4285.70 | 4285.70 | 4285.70 | 4285.70 | 4285.70 | 30,000 |
| 4. Testing |  |  | 865.70 | 865.70 | 865.70 | 865.70 | 865.70 | 865.70 | 865.70 | 6,060 |
| 5. Training and Support |  |  |  |  |  |  |  |  |  |  |
| 5.1 Training Cost |  |  |  |  |  |  |  | 850 | 850 | 1,700 |
| 5.2 Project Team Members | 2986.70 | 2986.70 | 2986.70 | 2986.70 | 2986.70 | 2986.70 | 2986.70 | 2986.70 | 2986.70 | 26880 |
| 6. Reserves |  |  |  |  | 4876.80 | 4876.80 | 4876.80 | 4876.80 | 4876.80 | 24,384 |
| Totals | 7,004.50 | 7,004.50 | 20,441.60 | 12,441.60 | 17,318.40 | 17,318.40 | 17,318.40 | 18,168.40 | 18,168.40 | 145092 |

Assumptions for the Cost estimate model

* Labour rate is R32 per hour for the project manager
* Labour rate for project team members is R67.20 per hour
* Outsourced software cost R2 000
* Server upgrade cost R3 per unit
* Software development cost R30 000
* Training and support cost R28 580
* The Project total estimate should be R120 000

## Earned Value Calculations

Values Given:

Planned Value (PV) = R120 000

Earned Value (EV) = R110 000

Actual Cost (AC) = 100 000

Budget at Completion = R150 000

a. Cost Value (CV) = EV – AC

= 110 000 – 100 000

= 10 000

**The project is doing quite well considering the cost value is positive it shows that it is still under budget.**

b. Schedule Variance (SV) = EV – PV

= 110 000 – 120 000

= - 10 000

**The negative schedule variance indicates that the project is behind schedule**.

c. Cost Performance index (CPI) = (EV/AC)

= 110 000 / 100 000

= 1.1 \* 100

= 110%

d. Schedule performance index (SPI) = (EV/PV)

= 110 000 / 120 000

= 0.92 \* 100

= 91.7%

e. Estimate at Completion = (BAC / CPI)

= 150 000 / 110%

= 136 363.70

**It looks like the project is performing better than what was initially planned.**

f. Estimated Completion Time = (Original time estimate/ SPI)

= 9 months / 91.7

= 9.8

= 10 months

**The project was expected to take 10-12 months to complete it.**

## Earned value chart

# Project quality management

## Requirements Checklist

Requirements for the system that will be used to measure stakeholder expectations.

1. Enterprise Analysis(Vision ,Mission ,Values)
2. Problem Statement
3. Proposed Solution
4. System Objectives
5. SWOT Analysis
6. Project Management Process Plans
7. Project Schedule
8. Project Scope statements
9. Project Requirements
10. Project Budget
11. Project Cost estimate

## Pereto chart

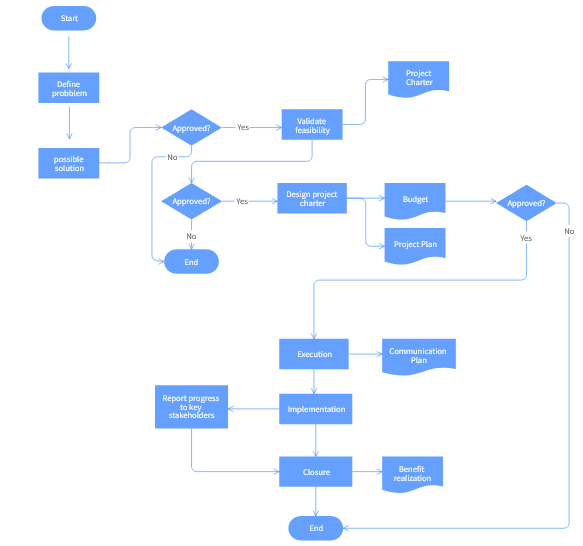
|  |  |  |
| --- | --- | --- |
| Complaints | Count |  |
| System too slow | 29 |  |
| Constant password change | 7 |  |
| Not user friendly | 23 |  |
| Long wait to get a response | 12 |  |
| Log-in issues | 21 |  |
| inaccurate reports | 6 |  |
| other | 2 |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  |  |

## Cause and Effect Diagram



## Logic and flow of processes



# **PROJECT PART 3**

# PROJECT HUMAN RESOURCE AND COMMUNICATIONS MANAGEMENT

## Theories of Motivation

**1.** Maslow's Theory- Physiological needs are the first source of motivation. That is, a person's essential survival needs, such as food, water, oxygen, and sleep, are met. The following level is that of safety and security. Health, work, property, and family are just a few examples. The demand for friendship with co-workers, as well as sexual and emotional relationships, is at the third level of the hierarchy. You are members of society and a group at the fourth level, and you require self-esteem and respect from others. Respect stems from the group's recognition of accomplishments. The need to grow and develop, also known as self-actualization, is the final phase. You desire to learn new things in order to expand your knowledge and solve difficulties, and you have the freedom to do so.

**2.** Douglas McGregor's Theory X and Theory Y - People, according to Theory x, need to be overseen and pushed into doing something.

**Theory X workers could be described as follows:**

* Individuals who dislike work and avoid it where possible
* Individuals who lack ambition, dislike responsibility and prefer to be led
* Individuals who desire security

Theory y argues that individuals are self-motivated and that all you have to do is motivate them to complete the task at hand.

* Consider effort at work as just like rest or play
* Ordinary people who do not dislike work. Depending on the working conditions, work could be considered a source of satisfaction or punishment
* Individuals who seek responsibility

**3.** Herzberg's Dual Factors (External/Internal) - The external environment, which is the workplace, motivates people. Because a bad atmosphere leads to poor performance, the external environment must be positive. A favourable external environment, on the other hand, will ensure that you do not do poorly, but it does not guarantee that you will perform well. Internal performance is the only factor that assures good results.

**4.** McClelland's Acquired Needs- People rely on acquired requirements to survive. That's a combination of accomplishment, affiliation, and authority.

• goal-oriented people function well when they have hard objectives.

• Affiliation-oriented persons function best as part of a group.

• power-oriented people excel when it comes to organizing or influencing others.

5. Myers-Briggs Extrovert Vs Introvert Theory - It all depends on how you view each of the people's motive agents. Extroverts and introverts are two different types of people. You must encourage each type's needs based on their qualities. Extroverts, for example, will be action-oriented, have a broad range of knowledge, engage in regular conversation, and be energized by spending time with the people they care about. Introverted persons, on the other hand, have traits such as being thought-oriented, possessing a depth of knowledge, engaging in considerable conversation, and generating energy from spending time with them. The aim is to instantly recognize people for their positive successes, praise positive behaviour, and handle undesirable behaviour before it becomes a problem.

We employed Douglas McGregor's Theory X and Theory Y as our motivating theories for this project. The use of Theory X implies that, in order to reach the project objectives, the project team would need to impose a management system of coercion, control, and punishment, such as failing the project, on project participants in order for them to meet the set goals in the time period specified. The upshot of this idea is that incentives of various types are likely to be the most popular motivation for achieving organizational goals. Using this approach, the objective is to establish a work environment (or culture) in which employees may express and develop their creativity. All of which we, as a project team, worked hard to achieve.

## Controlling and Reporting to ensure project success.

* As a team we are supposed to work with the project manager throughout the project project life cycle.
* The team has to complete all the assigned projects deliverables and meeting all the project scope requirements.
* All the project processes should be documented.
* Each team member has to contribute to the overall project performance.
* In case off bottlenecks, all possible solutions should be represented to the managers.
* The project manager should always be informed about the project progress to ensure project success.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| * **Project Leadership** | | **Project Team Members** | | | **Project Sub Team** | | | |
| **Activity/**  **Role** | Project manager | Head Developer System Analyst | System Designer | Head Programmer | Sponsor | | Senior Management | Investors | End User |
| **Initiation Phase Activities** |  |  |  |  |  | |  |  |  |
| Create Analysis Report | R/I | I | R/C | I | I/C | | C/R | C/I | I/C |
| Create Project Charter | C | A | C | C/I | I | | R/A | C | I |
|  |  |  |  |  |  | |  |  |  |
| **Planning Phase Activities** |  |  |  |  |  | |  |  |  |
| Build Project management Plan | R/A | C | C | A/C | C/I | | R | C | C/I |
| Create Schedule management Plan | R | I | I | C | C/I | | A | I | C |
|  |  |  |  |  |  | |  |  |  |
| **Executing Phase Activities** |  |  |  |  |  | |  |  |  |
|  |  |  |  |  |  | |  |  |  |
| Build Project management Plan | R/A | R/A | C | A | I | | R | C | C/I |
| **Controlling Phase Activities** |  |  |  |  |  | |  |  |  |
|  |  |  |  |  |  | |  |  |  |
| Build Product acceptance | R/A | R/A | I | I | C/I | | R | I | C |
|  |  |  |  |  |  | |  |  |  |
| **Closing** |  |  |  |  |  | |  |  |  |
| User satisfaction | R/C | R | A | I | R | | A | C | C/I |

## Responsibility Accountability RACI Matrix

**Keys**

|  |  |  |  |
| --- | --- | --- | --- |
| Responsible: R | Accountable: A | Consulted: C | Informed: I |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Project Leadership | | Project Team Members | | | Project Sub Team | | |
| Activity/  Role | Project manager | Head Developer System Analyst | System Designer | Head Programmer | Sponsor | Senior Management | Investors | End User |
| Test plan | R/A | C | C/I | C | I | R/A | I | I |
| Unit testing | R/A |  | R/A | R/A | C/I | A | C/I | I |
| Integration testing | R | C/I | C | I | I | A | C/I | C/I |
| System testing | R/A | I | C | I/C | C/I | R/A | I | I |
| Acceptance testing | R/A | I | C | R/I | I | R/A | C/I | C/I |

**Responsibility Assignment Matrix**

**Keys**

|  |  |  |  |
| --- | --- | --- | --- |
| Responsible: R | Accountable: A | Consulted: C | Informed: I |

## Stakeholder management strategy

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Stakeholder | Potential Impact on Project | Expectations of the stakeholder | Stakeholder management strategy | responsibility |
| Project manager | High | Clear Requirements | Be involved in every meeting, regular updates to the team members. | Managing the production of the required deliverables.  Planning and monitoring the project. |
| Head Developer System Analyst | Low | Resolving user problems | Have regular meetings and updates to the developing team. Constant training, determining system requirements | Directs and guides the application team in design, coding, testing, researching and analysing developments |
| System Designer | High | Develop a user friendly GUI | Be involved in every meeting, regular updates to the team members. | Creating system designs using technical specifications to meet the sponsors requirements. |
| Head Programmer | Medium | Working System | Be involved in every meeting, regular updates to the team members. | Meeting with sponsors and end users to discuss product specifications before development. Writing codes, maintaining, debugging, and troubleshooting systems and software. |
| Sponsor | High | On-time Project Delivery | Be involved in every meeting, regular updates to the team members. | Promotes the projects value and makes sure it has the right resources to succeed. |
| Senior Manager | Medium | Manage the overall project | Be involved in every meeting, regular updates to the team members. | Develop Project plans that identify resource and budgetary needs |
| Investors | High | On-time project delivery | Be involved in every meeting, regular updates to the team members. | Providing the necessary financial resources for the project. |
| End User | Low | Using the system |  | Protecting the information resources to which they have access to the system |

## Communication strategies and channels

|  |  |  |  |
| --- | --- | --- | --- |
| Stakeholder Group | Objectives | Delivery Method | Timing |
| Project Manager | Making sure that everyone submitted their tasks and delivered the correct documents or requirements. | Zoom meetings with team members and emails | Fridays of every week |
| Project team members | Update on given tasks and submission of previous tasks and activities. | Zoom meetings with team members and emails | Within 72 hours of task distribution. |
| Project Sponsor | Communicating the progress as well as giving updates on the project | Email communications  Zoom meetings | End of every month |

**Number of communication channels**

= 5(5-1)/2

= 10

**The communication channels used:**

* Emails
* WhatsApp messages and Calls
* Zoom meetings
* One-on-one meetings
* Phone calls
* Discussion threads
* Group meetings
* etc.

## Project status report

|  |  |  |  |
| --- | --- | --- | --- |
| **Reporting period:** | *06 March 2022 to 05 june 2022* | **Project title:** | *Residence maintenance system* |
| **Date of report:** | *05 june 2022* | **Project manager:** | *Mercy Mukulanga* |
| **Report author:** | *Amanda Chabvonga* | **Project Sponsor:** | *Lesego Ditibane* |

## Executive summary

Key :

**AMBER - close to expectation**

**GREEN- within expaction**

**RED- outside of expectation**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Narrative Summary of Status** | **Schedule:** |  | **Budget:** | **AMBER** | **Issues:** | **GREEN** |

## Project Milestone status review

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Project Plan ID | Project Milestones | Status | Baseline Completion Date | Expected Completion Date | Issues Exist (Yes/No) |
| *001* | Project kick off meeting | complete | 06-03-2022 | 06-03-2022 | no |
| *002* | Preliminary Investigation | complete | 12-03-2022 | 16-03-2022 | no |
| *003* | Data Analysis | complete | 17-03-2022 | 30-05-2022 | no |
| *004* | Feasibility Study | complete | 30-03-2022 | 27-05-2022 | no |
| *005* | System Planning | complete | 25-03-2022 | 27-05-2022 | no |
| *006* | System Analysis | complete | 03-06-2022 | 01-07-2022 | no |
| *007* | System design | pending |  |  |  |
| *008* | Project presentation | pending |  |  |  |

## status of planned activities

|  |
| --- |
| ***Planned accomplishments in this period:*** |
| * *Project kick off meeting* * *Preliminary Investigation* * *Data Analysis* * *Feasibility Study* * *System Planning* * *System Analysis* |

|  |
| --- |
| *Planned but not accomplished:* |
| * *System design* * *Project presentation* |

|  |
| --- |
| *Planned actions for the next period:* |
| * *System design* * *Project presentation* |

## Project issues summary

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***ID*** | ***Priority*** | ***Issue Description*** | ***Impact Summary (Milestone, Schedule Scope, Resources, Space…)*** | ***Action Steps*** |
| *001* | *M* | *Lack of communication* | *It took longer to finish tasks which affected the schedule* | *adding communication channels* |
| 002 | *H* | *Problems with meeting deadlines* | *It took longer to finish tasks which affected the schedule* | *Ensure that stakeholders do not miss meetings* |

## Project risk summary

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***ID*** | ***Priority*** | ***Probability of Occurrence*** | ***Risk Description*** | ***Impact Summary (Milestone, Schedule Scope, Resources, Space…)*** | ***Response Strategy*** |
| *001* | *H* | *M* | *Team conflict* | *Delay the project progress* | *Project manager needs to manage conflict properly* |

## Managing conflicts

Four Different approaches will be used to manage conflicts throughout the project lifecycle:

Confrontation: Project managers will deal directly with a conflict utilizing a problem-solving method that allows all parties involved to hash out their differences. In Covey's nomenclature, this method is referred to as the problem-solving mode or win/win. When both the task and the connection are critical, this mode is frequently the most productive.

Compromise: In order to settle conflicts, project managers will use a give-and-take approach. They haggle and look for solutions that satisfy all parties involved in a conflict to some extent. When both the task and the connection are of medium significance, this mode works best.

Forcing: The forcing mode can be thought of as a win-or-lose strategy for resolving conflicts. Project managers will assert their point of view at the expense of another's. This mode can be very effective if the work is of great importance and the relationship is of low value.

Collaborating: Decision makers use the collaborating mode to absorb multiple perspectives and insights in order to reach consensus and commitment. Managers commit to following a decision in the best interests of the organization, even if they don't agree with it.

# PROJECT RISK MANAGEMENT

## Risk management plan

|  |  |  |  |
| --- | --- | --- | --- |
| RISK EXAMPLE | LIKELIHOOD  (Low,Medium,High) | IMPACT  (Low,Medium,High) | MITIGATION STRATEGIES |
| Team conflicts | HIGH  (Team members disagree more often on a lot of things) | MEDIUM  (Causes disunite and lack of trust within the project team ) | Improve problem handling and communication within the team. |
| Missing deadlines | MEDIUM  (Due to disagreements, not attending meeting and lack of communication within the team it takes longer to finish tasks) | LOW  (Missing of deadlines) | Enforcing rules so that project members do not miss meetings, communicate and be on time. |
| Project spending might be more than what was originally budgeted | HIGH  (More money being required in order to complete the project) | HIGH  (Project funds might not be enough to finish the entire project) | Improving the cost estimates by hiring financial expertise. |
| Some members of the team are unfamiliar with the programming language that is required. | MEDIUM  Having to learn the language and program at the same time may slow down the project schedule) | MEDIUM  (It might take longer to finish coding) | Sending developers on a training program and assigning each one a development partner to supervise work is a good idea. |
| Other competitors might be developing a similar system | LOW  Having many competitors. | LOW  (Our system might not be recognized) | We stick to our project objectives. |

## Risk register

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ID | RISK | IMPACT DESCRIPTION | RISK CATEGORY | IMPACT IF RISK OCCURS | PROBABILITY | RESPONSE | RESPONSIBLE | STATUS |
| 1 | Project spending might be more than what was originally budgeted | Project funds might not be enough to finish the entire project. | Financial | HIGH | HIGH | Improving the cost estimates by hiring financial expertise. | PROJECT MANAGER | open |
| 2 | Missing deadlines | The project might be behind the schedule. | People | MEDIUM | LOW | Enforcing rules so that project members do not miss meetings, communicate and be on time. | PROJECT MANAGER | closed |
| 3 | Some members of the team are unfamiliar with the programming language that is required. | It might take longer to finish coding. | Technology | MEDIUM | MEDIUM | Sending developers on a training program and assigning each one a development partner to supervise work is a good idea. | HEAD PROGRAMMER | In progress |
| 4 | Other competitors might be developing a similar system | Our system might not be recognized | Market | LOW | LOW | We stick to our project objectives. | PROJECT MANAGER | closed |
| 5 | Conflicts amongst team members | Causes disunite and lack of trust within the project team. | People | LOW | MEDIUM | Improve problem handling and communication within the team. | PROJECT MANAGER | In progress |

## Probability/ impact matrix

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| PROBABLITY | High |  |  | RISK 1 |
| Medium | RISK 5 | RISK 3 |  |
| Low | RISK 4 | RISK 2 |  |
|  | Low | Medium  **IMPACT** | High |
|  | | | | |
|  | | | | |
|  | | | | |

## QUANTITATIVE AND QUALITATIVE RISK ANALYSIS

Key

RED – Risks warrant a response

YELLOW – Risks that require further analysis and investigation

GREEN – Risks that can be ignored

**Risk Impact Grades**

|  |  |  |
| --- | --- | --- |
| Rating | | Interpretation |
| 10 |  | Project failure |
| 9 |  | Over budget or delay by 50% |
| 8 | high | Over budget or delay by 30% – 40% |
| 7 |  | Over budget or delay by 20% - 30% |
| 6 |  | Over budget or delay by 10% - 20% |
| 5 | medium | Slightly over budget or deadline |
| 4 |  | Serious reduction of reserves or buffers (time/cost) |
| 3 |  | Med reduction of reserves or buffers (time/cost) |
| 2 | low | Small reduction of reserves or buffers (time/cost) |
| 1 |  | No impact |

**Probability Grades**

|  |  |
| --- | --- |
| Rating | interpretation |
| 10 | A fact |
| 9 |  |
| 8 | High probability |
| 7 |  |
| 6 |  |
| 5 | Medium probability |
| 4 |  |
| 3 |  |
| 2 | Low probability |
| 1 |  |
|  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| PROBABILTY |  | 10 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| High | 9 | 9 | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 | 90 |
| 8 | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | 80 |
| 7 | 7 | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 | 70 |
| Med | 6 | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60 |
| 5 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| 4 | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 |
| Low | 3 | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 |
| 2 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|  | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Low | | | Med | | | High | | | | |
| IMPACT | | | | | | | | | | |

**Impact Probability Matrix**

**Likelihood Ratings**

|  |  |
| --- | --- |
| Rating | interpretation |
| 10 |  |
| 9 |  |
| 8 | LIKELY |
| 7 |  |
| 6 |  |
| 5 | POSSIBLE |
| 4 |  |
| 3 |  |
| 2 | UNLIKELY |
| 1 |  |

**Consequence Ratings**

|  |  |
| --- | --- |
| Rating | interpretation |
| 10 |  |
| 9 |  |
| 8 | MAJOR |
| 7 |  |
| 6 |  |
| 5 | MODERATE |
| 4 |  |
| 3 |  |
| 2 | MINOR |
| 1 |  |

**Consequence-Likelihood Matrix**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| LIKELYHOOD |  | 10 | Low  10 | Medium  20 | Medium  30 | Medium  40 | High  50 | High  60 | High  70 | High  80 | High  90 | High  100 |
|  | 9 | Low  9 | Medium  18 | Medium  27 | Medium  36 | Medium  45 | High  54 | High  63 | High  72 | High  81 | High  90 |
| 8 | Low  8 | Low  16 | Medium  24 | Medium  32 | Medium  40 | Medium  48 | High  56 | High  64 | High  72 | High  80 |
| 7 | Low  7 | Low  14 | Medium  21 | Medium  28 | Medium  35 | Medium  42 | Medium  49 | High  56 | High  63 | High  70 |
| POSSIBLE | 6 | Low  6 | Low  12 | Medium  18 | Medium  24 | Medium  30 | Medium  36 | Medium  42 | Medium  48 | High  54 | High  60 |
| 5 | Low  5 | Low  10 | Low  15 | Medium  20 | Medium  25 | Medium  30 | 35 | Medium  40 | Medium  45 | High  50 |
| 4 | Low  4 | Low  8 | Low  12 | Medium  16 | Medium  20 | Medium  24 | Medium  28 | Medium  32 | Medium  36 | Medium  40 |
| UNLIKELY | 3 | Low  3 | Low  6 | Low  9 | Low  12 | Medium  15 | Medium  18 | Medium  21 | Medium  24 | Medium  27 | Medium  30 |
| 2 | Low  2 | Low  4 | Low  6 | Low  8 | Low  10 | Medium  12 | Medium  14 | Medium  16 | Medium  18 | Medium  20 |
| 1 | Low  1 | Low  2 | Low  3 | Low  4 | Low  5 | Low  6 | Low  7 | Low  8 | Medium  9 | Medium  10 |
|  | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| MINOR | | | MODERATE | | | MAJOR | | | |
| CONSEQUENCE | | | | | | | | | |

## RISK RESPONSE PLAN

|  |  |  |
| --- | --- | --- |
| RISK | RESPONSE | Risk Consequences Low/Med/High |
| Some members of the team are unfamiliar with the programming language that is required. | **Mitigate:** Sending developers on a training program and assigning each one a development partner to supervise work is a good idea.  Project monitoring should be done more often.  Avoid stand-alone project structures by emphasizing team support. | Medium |
| Project spending might be more than what was originally budgeted | **Transfer**: Improving the cost estimates by hiring financial expertise. | High |
| Other competitors might be developing a similar system | **Accept:** This service is required for our final year project.  Project monitoring should be done more often. | Low |
| Missing deadlines | **Mitigate:** Enforcing rules so that project members do not miss meetings, communicate and be on time. | Medium |
| Conflicts amongst team members | **Mitigate:** Improve problem handling and communication within the team. | Low |

**The Table below represent Risk Management Responsibilities**

**One of the following approaches will be used to handle each main risk:**

• ***Avoid***- remove the threat by removing the source

• **Mitigate** – Determine how to reduce the risk's likelihood or impact.

• **Accept** - There will be no action taken.

• **Transfer** – Make someone else responsible for the risk. (outsourcing, etc.)

**RISK MONITORING AND CONTROLLING**

* Throughout the project's lifecycle, the amount of risk will be measured, managed, and reported.
* All requests for project changes will be evaluated for their potential influence on project risks.
* Management will be notified of important changes to risk status as a component to the Executive Project Status Report.
* As part of the Executive Project Status Report, management will be advised of significant changes in risk status.

## Procurement

The student residence maintenance system will be made up of an interface which allows students to report maintenance issues and staff to access and address them, a database which can be accessed by the team at maintenance and a dashboard to show all the reported issues after they have been sorted and categorised. This dashboard will be designed using a dashboard software tool which we will outsource.

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