**Change History**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Version | Date | Reason | Author | Approved |
| 1.0 | 6th May 2010 | Initial Version | Dell Topel  Chih Hsiang Tang  Jane Harrison  Justin Mancinelli  Wei Yeap Cheng  Xing-Shu Liu |  |
| 2.0 | 25th Jul 2010 | WBS and SOW better reflect current state of project | Dell Topel  Justin Mancinelli |  |
| 2.1 | 30th Aug 2010 | Typographic consistency across documentation | Justin Mancinelli |  |
| 3.0 | 31st Aug 2010 | Addition of “Document Style Specification” section.  Update of style according to the specification.  Modification of sections 3.2.2, 3.2.3, | Justin Mancinelli |  |

Tiffany Gold Mine Environmental Management Reporting System Project Plan

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# ****Introduction****

## Tiffany Gold Mine Environmental Management Reporting System

Hereafter known as TiGERS.

## Description and Goals

This document describes the work required in developing TiGERS and the procedures to be followed in carrying out that work. It includes **project organisation, management and technical approaches, work to be done, and the project schedule. It details how the project will be executed, monitored, controlled and closed.**

TiGERS is a database system which is driven by web-based data entry screens. Users will be able to enter environmental water monitoring data, and generate reports so they can analyse that data.

The system is required to provide interfaces to allow different users to perform different functions. In brief:

* Laboratories will be able to bulk-upload values for measured parameters at existing sampling locations assigned to them, and to notify the requestor of the analysis of this action via email.
* Contractors will be provided with an account through which they will be able to assign sampling locations to laboratories and to add media files depicting the area that they have collected water samples at, which they have subsequently sent to a laboratory. They will also be able to notify the requestor of the completion of a screening program via email.
* Tiffany environmental officers will use the system to enter new sampling locations and assign them to contractors, and to email contractors to instruct them to start a screening program. In addition they will be able to manage exceedance values for parameters and generate reports containing tables, graphs and maps in order to investigate when and where exceedances occurred.
* System Administrators will be provided with an account through which they will be able to set up and manage accounts but are unable to access reporting functionality or modify any data.

The system will have great benefit for Tiffany Gold Mine by

* Enabling consultants and laboratories to quickly and reliably enter collected data directly into the database
* Enabling the environmental officers to analyse collected data rather than spending most of their time entering the data.
* Enable environmental officers and managerial staff to produce various environmental reports for regulatory agencies, community groups or internal use

This will increase the accuracy and management of the data, as well as providing more flexible reporting capabilities.

## Project Sponsor

Ms Laurence Rossato, Manager of Environment and Community Relations, Tiffany Gold Mine, the sponsor company.

All communications between the developing team and Tiffany Gold Mine are to be conducted through the nominated sponsor contact:

|  |  |
| --- | --- |
| Dr Alex Pudmenzky | Email: [csse3004@itee.uq.edu.au](mailto:csse3004@itee.uq.edu.au)  Telephone: 07 3346 4052 |

## Project Manager

|  |  |
| --- | --- |
| Ms Dell Topel | Email: dell.topel@uqconnect.uq.edu.au Telephone: 07 3396 7593 |

## Product Description

TiGERS is a web based application which will run in any internet browser. It will comprise several interfaces for different users, and access will be controlled via user accounts. A user will be redirected to the appropriate web page once they have logged in via an initial login screen. User accounts will be maintained by system administrators. A comprehensive online help facility will be incorporated. System functionality is described in detail in the Business Requirements Document.

The system will be developed in Java using an Oracle database.

All source code will be provided as well as scripts for the database schema.

All executables and configuration files will be provided. The system will be fully installed at the Tiffany Gold Mine offices by one of our software engineers.

There will be two hard copy manuals delivered with the final product:

* System manual, including configuration and maintenance information.
* A User Manual for environmental officers.

## Reference Material

Pudmenzky, Alex. Business Requirements Specification. 23rd February 2010. Web.

Jane Harrison & Dell Topel. Business Case. 25th March 2010. Print.

Jack T. Marchewka. Information Technology Project Management. 2009. Print.

Focus Plus Pty Ltd. Project Deliverable Requirements. 2010. Web.

## Acronyms and Definitions

This section provides the definition of all terms, acronyms, and abbreviations required to properly interpret this document. It contains some terms that have a special meaning in this project.

|  |  |
| --- | --- |
| System Administrator | An administrative employee of Tiffany Gold Mine who uses the system to manage accounts. The administrator of the Environmental Management System (as opposed to the computer system). |
| Laboratory | A facility that provides controlled conditions in which the quantitative chemical analysis of water samples takes place. |
| Contractor | An environmental consultant company providing water monitoring services to the Tiffany Gold Mine. |
| Environmental Officer | Employee of Tiffany Gold Mine who is responsible for the environmental management of the mine and who uses the system to detect and control disturbances caused by mining. |
| Database schema | Definitions of tables needed for the Oracle database. |
| SQL | Structured query language. A programming language used to communicate with the database. |
| Gantt Chart | A bar chart which illustrates a project schedule. |
| Camel case | The practice of writing phrases in which the elements are joined without spaces and each element's initial letter capitalised. Lower camel case has the first letter in lower case. |

# 

# ****How the Project is Organised****

## Organisational Chart

The project will adopt the project organisational Structure.

Laurence Rossato

Client Project Director

Alex Pudmenzky

Client Contact

Project Manager

Dell Topel

Justin Mancinelli

Database Design

Sean Tang

Analyst Designer

Xing-Shu Liu

Documentation

Nicholas Cheng

Testing

Jane Harrison

Quality Assurance

Tiffany Gold Mine Contacts

Project Team Organisation

## Project Responsibilities

Project Manager: Dell Topel

The project manager has overall responsibility for the project. She is responsible for the development of the project plan, organising the project resources and overseeing execution of the plan. She must also perform administrative functions such as project tracking and reporting.

Database Designer: Justin Mancinelli

Responsible for the design of the database schema and for writing the SQL scripts to create the database tables, indexes and triggers.

Tester: Nicholas Cheng

Responsible for writing the unit and system test plans and for executing those plans, as well as documenting the results.

Analyst Designer: Sean Tang

Responsible for writing the design specifications for the system. This includes designing the user interfaces and designing the programs to execute the business logic.

Documentation: Xing-Shu Liu

Responsible for writing the documentation for the system, including the project plan, the system requirements specification, the system installation guide and the user guide.

Quality Assurance: Jane Harrison

Responsible for insuring that all project deliverables meet the required specifications.

Justin, Sean and Jane will also be responsible for writing the application code.

## Other Organisational Processes

Regular project reporting is to be carried out bi-weekly throughout the duration of the project. This will consist of:

* A project report, including details and minutes of any meetings that have taken place within the reporting period.
* A timesheet in which all team members have recorded time spent on project tasks.
* A tracking Gantt chart.
* Project status report.
* An individual intragroup report submitted by each team member.

# ****Management and Technical Approaches****

## Management Processes

### Priorities, Assumptions and Constraints

#### Assumptions

* There will be no change to the scope of this project (As stated in lectures.). Project scope is clearly defined in the business requirements specification.
* There is no procurement management applicable for this project plan as no external resources are needed.
* There is no cost management element because a budget element is not applicable.

#### Constraints

* This document will remain a work in progress throughout the duration of the project and has been initially prepared with information available at this time. The document will be updated as more accurate information becomes available.
* Submission dates of the project deliverables are defined in the Project Deliverables Requirements document and are fixed.
* Each team member will be working on other projects at the same time as this one.

### Communications Management

#### Communications planning and Information Distribution

An internet Google Groups account has been set up and access granted to all project team members. (http://groups.google.com/group/csse3004gc-2010) All internal communication will be via this webpage so that the information is available to all members and a record is kept.

The G: drive on the UQ network has been provided for the project team’s use, as well as a subversion account. These can be accessed directly in the labs in building 78 or at home using appropriate file transfer software.

Weekly team meetings are to be held on Thursday, 1-2pm in the common area on the second level of building 78. On the Tuesday before, the project leader will issue a request for any items to be added to the meeting agenda. The agenda will then be posted on Google Groups the day before the meeting. The meeting will be chaired by the project leader and the minute taking will be rotated through the other members of the group. The minutes will be typed up no later than the next day and uploaded to the G: drive.

If any further meetings are required then that will be raised in the weekly meeting, or if time is of the essence, a message posted on Google Groups and a mutual time agreed upon by participants.

Project documents which form part of the deliverables will be stored on the G: drive, in the deliverables folder. Work in progress will be stored in the drafts folder. Documents will be saved there once they have been finalised prior to submission with v1.0 appended to the end of the document name. When a document requires an amendment, then the old version will be kept, and the new version saved with the version number incremented by .1. At this stage, it is not envisaged that any major revisions will be needed so a change to version 2, for example, will not be necessary. Each document will use the title page template and the change history template stored in the document templates folder. Documents will be written using Microsoft Word, using Tahoma 12 as the font and using the default heading styles.

As the project progresses and develops it may be necessary to change these communications processes as better ways of working are discovered. Any issues or refinements are to be raised in the weekly team meeting. If changes are approved then the project plan will be amended as described previously in this section.

Communication with the project sponsor is via bi-weekly group report submissions. These have been covered briefly in section and no further elaboration is required here.

#### Administrative Closure

When the final software component of the project has been delivered and been accepted by the project sponsor, then a number of administrative closure processes can be completed.

It should be verified that all project deliverables have been completed.

Formal acceptance is documentation that sponsor or customer signs to show that they have accepted the product. Formal acceptance by the project sponsor should be verified.

All project documentation is to be printed and stored in an organised manner in an archive folder. This will provide an accurate history of the project.

A post-implementation review will be completed. Each project deliverable will be reviewed alongside the effectiveness of the project plan in delivering those components.

### Quality Management

Quality will be incorporated into design, build and testing activities. It is expected that all team members will take pride in their work and will aim to meet required specifications as a minimum. Quality is the responsibility of all team members, although the team member responsible for quality assurance will ensure that quality processes are followed, thereby ensuring that requirements are met, and that the deliverables produced are of a high standard.

#### Verification

The end product of this project is the TiGERS software component. Processes will be put in place to ensure that this system functions as specified in the Business Requirements Specification.

##### Business Reviews

Designed to ensure that the IT solution provides the required functionality specified in the project scope and requirements definition. Before the due date of each deliverable, a meeting will be scheduled between the author of the deliverable, the team member in charge of quality assurance and at least one other team member. These meetings will be egoless. The deliverable is being reviewed, not the author. In the meeting it will be ensured that each deliverable is complete, provides the necessary information required for the next phase or process and that it meets predefined standards.

##### Management Reviews

Before the bi-weekly project reporting, the project manager will compare actual project progress against the project plan to provide a clear idea of the current status. Issues may need to be resolved and resources adjusted. The project manager may also need to review the project to determine that it meets scope, schedule and quality objectives.

##### Process Reviews

At each weekly team meeting, the management processes in the project plan will be discussed to ensure that the processes are being followed, and it not then any necessary changes will be made. Changes will be approved by the project manager.

#### Validation

Validation ensures that the system performs as specified, and that it has all the required functionality as defined in the project’s scope and requirements.

Tests should be designed to get the most effect from the least number of tests.

* Unit testing will be black box testing, i.e. the program code will be tested against the specified requirements.
* Unit testing will be used at the program level. The team member responsible for testing will write and perform the tests. Tests will be written using a standard template stored on the G: drive. Results will be passed back to the programmer and any errors corrected. The tests will be rerun in this manner until all tests pass. Test documents will be stored in a test folder on the G: drive.
* Integration testing tests whether a set of programs work together properly. Tests will be performed in the same way as for unit testing.
* Systems testing checks whether the system works as a whole in an operating environment. The system will be installed on a clean machine using the installation guide, to verify that both are complete.

### Time Management

Project time management involves processes required to ensure timely completion of a project.

For this project, there will be no changes of scope.

#### Activity Definition

A detailed work breakdown structure containing the work to be done has been developed as part of this document and is described in section .

The project started on 15th April and will end on 25 October 2010.

#### Activity Sequencing

Dependencies between activities were derived based on the deliverable requirements schedule and project progress management. Work may begin on a phase before the previous phase is signed off because the project is to be completed within a fixed time.

#### Activity Duration Estimating

Durations were estimated based on the total time necessary for part-time workers to complete each task in a timely manner. A timely manner is defined as being able to complete a component before a dependent component must be started. The start times are based on the hand-off requirements of each deliverable.

#### Schedule Development

A schedule has been developed using Microsoft Project to produce Gantt charts. Due dates of deliverables were used as inputs, as well as the activity sequencing and duration estimating described previously in this section. Schedules are included in section of this document.

#### Schedule Control

Contingencies should be allowed for throughout the life of the project. There will be no changes to scope for this project.

The project manager will review the schedule regularly and must understand why activities are not on schedule and be proactive. If the schedule starts to slip then extra resources should be allocated when necessary. As the project progresses, then actual times taken for activities will be known and these can be applied to later activities thereby increasing or decreasing durations. Activities may then be reordered so that the overall project will still come in on time.

Team members are expected to record time spent on activities on their individual timesheets, stored on the G: drive. This will allow the project manager to detect and rectify any slippages in a timely fashion.

### Scope Management

#### Initiation

Strategic planning and project selection was carried out by the sponsoring company. A business case for TiGERS has been approved. Business requirements have been detailed in a separate document by the client contact. A project charter has also been approved.

#### Scope Planning

TiGERS is expected to provide a number of benefits to Tiffany Gold Mine. It is expected to recoup its costs within 3 years of going into production. Full details of the financial analysis can be found in the business case. From a business perspective the system will provide increases in data reliability, staff productivity and flexibility in reporting.

TiGERS is a software system which will revamp Tiffany Gold Mine’s existing procedures on environmental data collection, reporting and analysis. It will aim to solve current issues with dealing with increasingly large data sets by streamlining processes, and also by tailoring a more flexible system to better fit the working environment.

The system will run on an Oracle database and provide a web based front-end interface for users of the system. Functions of the system include data entry, report generation, analysis tools, and other management or administration features such as maintaining user accounts and assigned roles for all end users, the ability to modify sampling locations and so on.

On completion of the project, the development team will provide the project sponsor with the following:

* All source code for the application
* All related scripts, including database schemas
* Executable application, including necessary configuration files
* Full installation and deployment of system at the Tiffany Gold Mine offices
* A system manual, which covers all aspects of managing the system for system administrators and other relevant administration staff
* A user manual, documenting procedures for data entry into the system, using the system for report generation, and other miscellaneous procedures, such as assigning sampling locations to external consultants

A post-implementation review will also performed after the completion of this project, in order to measure the overall success and effectiveness of this project. In particular, it will gauge how well the implemented system achieves the project’s objectives. The project will be deemed successful if:

* It is completed on or before the expected delivery date
* The implemented system meets its goals, such as allowing users to quickly and easily enter data into the system and request reports to be generated
* The system is able to do all tasks accurately and is a stable and reliable platform for Tiffany Gold Mine to base its environmental monitoring operations on
* The system increases productivity (I.e. it doesn’t require more administration work or staff training than is documented in the initial business case)
* No significant additional costs are incurred, other than that already allocated for this project
* All required products are delivered

#### Scope Definition

Full details of the scope definition are included in section *Work Breakdown Structure*. Work has been broken down into four main sections: planning, execution, controlling and project deliverables. These sections have then been further refined.

#### Scope Verification

The project scope will be formally accepted when this project plan has been approved by the client contact on behalf of by the project sponsor.

#### Scope Change Control

No changes to scope are expected.

### Cost Management

A budget is not required for this project therefore no cost management processes are needed.

### Human Resource Management

Human resources management involves processes to make the most effective use of the people involved in a project.

Roles and responsibilities for this project were decided in the initial team meeting. Section of this document contains an organisational chart, and section contains a description of project roles and responsibilities.

It is intended that all current team members will work on the project for its entire duration. If anything unforeseen should happen, and this is no longer the case, then responsibilities will be reallocated by mutual decision between the project manager and individual team members.

All team members will respect and support each other in their roles and if it is found that an individual may achieve more in a different role, then responsibilities can be re-allocated, again with mutual consent between the project manager and individual team members. In some cases, this may involve a sharing of workload to ensure certain members are not overworked.

The project leader is expected to resolve any conflicts between team members.

### Procurement Management

No outside products or services are required for this project.

### Risk Management

#### Potential Risk Conditions

|  |  |
| --- | --- |
| Knowledge Area | Risk Conditions |
| Integration | Inadequate planning; poor resource allocation; poor integration management; lack of post implementation review. |
| Scope | Poor definition of scope or work packages; incomplete definition of quality requirements; inadequate scope control. |
| Time | Errors in estimating time or availability; poor allocation and management of float. |
| Cost | Estimating errors; inadequate productivity; cost change or contingency control; poor maintenance, security, purchasing. |
| Quality | Poor attitude towards quality; substandard design/ workmanship; inadequate quality assurance |
| Human Resources | Poor conflict management; poor project organisation and definition of responsibilities; absence of leadership. |
| Communications | Carelessness in planning or communication; lack of consultation with key stakeholders. |
| Risk | Ignoring risks; unclear assignment of risks; poor insurance management. |
| Procurement | N/A for this project |

#### Why Manage Project Risk?

* No project is immune from risk
* Ignoring or not understanding risk won’t make it go away
* Increasingly large and complex system
* Cost of software failure
* Failure to manage risk and communication

If something does go wrong, how do we fix it?

#### Point Rating System

The point rating system has been developed to assist in our risk management. Each of these possible risks has been categorised however the importance of their threat to the project should not be neglected or taken lightly. Each individual component is carefully rated, advising us on the precautionary action to be taken based on the table shown below.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Impact | | | | |
| Likelihood |  | 1 | 2 | 3 | 4 |
| 1 | Accept | | Transfer | |
| 2 |
| 3 | Mitigate | | Avoid | |
| 4 |

L: Low (1 or 2 point)

M: Medium (2 or 3 points)

H: High (3 or 4 points)

#### Risk Matrix

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Risk factor | Likelihood | Impact | Score  (Multiply) | Response Measure |
| Technical:  Employee not equipped with IT knowledge OR does not know how to use the new system | 2 | 2 | 4 | The product shall be made as easy to use as possible and relevant to the existing concepts which have been adopted by the users. Interactive paradigm will be implemented to eliminate any ambiguity. |
| Technical:  Internet Service Provider fails to connect to the internet | 1 | 2 | 2 | Call the Internet Service Provider hotline to justify and remedy this issue as soon as possible. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Risk factor | Likelihood | Impact | Score  (Multiply) | Response Measure |
| Communication:  Team member is not aware there is a meeting. | 1 | 1 | 1 | Medium used for communicating with the team should not be ambiguous. Environment should be somewhere quiet and controlled so message being transmitted to the team will not be distorted. Ask team members to confirm they received the information. |
| Technical:  System crashed, resulting in not being able to retrieve information | 1 | 3 | 3 | Avoid installing unrecognised software or inserting any unknown source of external storage device, try to perform system rollback and keep separate sets of important documents on several computers, evenly distributing the load and reducing the risk of impact. |
| Human Resource:  Team member not able to attend work | 2 | 3 | 6 | Project Manager should call the absentee to find out what exactly happened and reschedule to prevent over-allocating of roles and responsibilities on the team from the task of the absentee which could be covered by the rest of the team. |
| Time:  Delivery of final product falls behind schedule | 3 | 4 | 12 | Team members should always follow their planned schedule closely, hold meetings weekly to ensure all team members are aware of the current progress, and monitor this progress to ensure that the team is not falling short of the critical path. Notify the rest of the team if help is needed. |
| Integration:  Insufficient number of team members assigned to a task | 2 | 3 | 6 | Encourage team members to notify others if any difficulties arise. When such difficulties do arise, the issue should be raised at team meetings where an agreement can be made to rectify the issue. |
| Scope:  Project requirement not correctly written | 2 | 4 | 8 | Project Manager should always ensure what they are about to produce is exactly what the client is expecting. Initiate meeting with client if required to prevent further misconceptions. Proper documentation should be created and signed off to resolve any ambiguity. |
| Risk factor | Likelihood | Impact | Score  (Multiply) | Response Measure |
| Quality:  Final product does not meet the agreed requirements | 1 | 4 | 4 | Regularly check the software development with the scope and client to ensure that their requirement of the system is being developed. If there is anything that they are unsure of, team members should seek clarification it as soon as possible to prevent developing the wrong product. |

### Integration Management

Integration management coordinates all the previous management areas, and is the responsibility of the project manager.

#### Develop the Project Charter

The development of the project charter initiates the project. The project charter approves and sanctions the project and gives the project manager the authority to act and apply organisational resources to the project.

#### Develop the Project Management Plan

Developing the project management plan (section of this document) includes all activities needed to create and integrate all subsidiary plans into the project management plan. This plan will detail how the project is executed, managed, and monitored.

#### Direct and Manage Project Execution

Directing and Managing Project execution is orchestrating how the project team performs the actions to implement the project management plan and complete the work detailed in the project scope.

#### Monitor and Control Project Work

Monitoring and Controlling Project work measures and balances the projects progress and any corrective or preventative actions needed to assure all project objectives are met. The project manager must be both proactive and reactive.

#### Integrated Change Control

Integrated Change Control is the change control process for the project which includes authorising changes and managing changes to project plans and deliverables. The key benefit to this process is that only validated approved changes are implemented.

#### Close Project

Closing the project equates to completing all project activities, delivering the final project and obtaining the client approval to formally close the project.

### Staffing

Not relevant for this project.

## Technical Processes

### Software Development Life Cycle

This project will adopt the waterfall model.

This model is suitable for this project because the system requirements will not be subject to change and it enables the project manager to easily track progress. It will encourage the team to get the design correct early in the process as mistakes will be costly to fix later.

Project Planning

Requirements definition

Installation & acceptance

Development

Design

Integration & test

### Code Versioning

All source code, SQL scripts, and documentation will be stored using subversion. The group account can be found at <https://tigers.googlecode.com/svn/trunk/>. All documentation will have an amendment history at the top in a comment block. Project team members will be given working copy folders on the ITEE group drive.

### Development Tools

The project team will be using the following software development tools. All developers will be using the same versions.

* Java JDK 1.6
* Eclipse IDE 3.3
* Oracle Database 10g
* Hibernate 3.2.6
* Jetty 6.1.9
* Spring Framework 2.5.4
* AppFuse 2.0.2

### Code Naming Conventions

As the code is written in Java, programs will adhere to common industry practice.

* Class names will be written in camel case
* Variable names will be written in lower camel case
* All variables and classes will have meaningful names
* Loop control variables will be confined to i, j & k.
* Constants will be written in upper case with an underscore between words.

### Testing Processes

Testing of individual classes will be carried out using JUnit during development so that the tests are robust and repeatable.

### ****Work Location****

**All project work is to be carried out in lab 110 in building 78 at the University of Queensland or in the homes of the individual team members.**

# ****Work to be Done****

## Work Breakdown Structure (WBS)

1. TiGERS
2. Planning
   1. Project Charter
   2. Project Plan
      1. Project Organization
      2. Management and Technical Approaches
      3. Work to be Done
         1. Work Breakdown Structure
         2. Statement of Work
      4. Schedule
         1. Schedule Meetings
         2. Schedule Deliverables
         3. Schedule Work Breakdown Tasks
   3. Software Requirements Specification
      1. Use Case Specifications
         1. Use Case Diagrams
         2. Use Case Description
      2. Supplementary Specifications
      3. Project Glossary
      4. Sample Reports
   4. Design Planning
      1. Database Design Specification Planning
         1. Plan Scripts
         2. Plan ER Diagram
         3. Plan Data Dictionary
         4. Plan Table Mapping
         5. Plan Normalisation
         6. Plan Queries and Triggers
      2. Web Interface Design Specification Planning
         1. Plan Forms
         2. Plan Reports
      3. Backend Design Specification Planning
         1. Plan Business Logic
            1. Plan Form Generation Methods
            2. Plan Report Generation Methods
      4. Integration Design Planning
         1. Database/Backend Integration Planning
         2. Backend/Web Interface Integration Planning
         3. Plan Website Mapping
      5. Test Design Planning
         1. Plan Database Tests
         2. Plan Backend Tests
         3. Plan Web Interface Tests
         4. Plan Integration Tests
   5. Development Planning
      1. Database Development Planning
      2. Web Interface Development Planning
      3. Backend Development Planning
      4. Integration Development Planning
      5. Test Development Planning
3. Execution
   1. Execute Design
      1. Execute Database Design
         1. Design Scripts
         2. Design ER Diagram
         3. Design Data Dictionary
         4. Design Table Mapping
         5. Design Queries and Triggers
      2. Execute Web Interface Design
         1. Design Forms
         2. Design Reports
         3. Design Presentation
      3. Execute Backend Design
         1. Design Business Logic
         2. Design Form Generation Methods
         3. Design Report Generation Methods
      4. Execute Integration Design
         1. Design Database Configuration
         2. Design Website Mapping
      5. Execute Test Design
         1. Design Unit Tests
         2. Design Functionality Tests
         3. Design Requirements Tests
   2. Execute Development
      1. Database Development
         1. Develop Scripts
         2. Develop Database
         3. Develop Triggers
      2. Execute Web Interface Development
         1. Develop Forms
         2. Develop Reports
      3. Execute Backend Development
         1. Develop Model Objects/Methods
         2. Develop Form Generation Methods
         3. Develop Form Retrieval Methods
         4. Develop Report Generation Methods
         5. Develop DAO Methods
      4. Execute Integration Development
         1. Develop Database Configuration
         2. Develop Web Server Configuration
         3. Develop Website Mapping
      5. Execute Test Development
         1. Unit Tests
         2. Functionality Tests
         3. Requirements Tests
4. Controlling
   1. Have Meetings
      1. Take Minutes
   2. Progress Management
      1. Project Status Reports
      2. Project Performance Reports
      3. Project Forecasting
   3. Change Management
      1. Change Request Documentation
      2. Change Request Review
      3. Change Request Approval
   4. Deliverables Management
      1. Draft
      2. Review
      3. Finalize
   5. Project Reporting
      1. Project Reporting 1
      2. Project Reporting 2
      3. Project Reporting 3
      4. Project Reporting 4
      5. Project Reporting 5
      6. Project Reporting 6
      7. Project Reporting 7
      8. Project Reporting 8
      9. Project Reporting 9
5. Project Deliverables
   1. Planning Phase
      1. Project Plan
      2. Software Requirements Specification
      3. Entity Relationship Diagram
      4. Test Cases & Results
      5. Recovery Scripts and Demonstration of The Working Components
      6. Reflective Review
   2. Execution & Controlling Phase
      1. Individual Component(s) Agreements
      2. Test Plan
      3. Demonstration of the individual component(s)
      4. Proven Use of Project Plan & SRS
      5. Project Analysis Presentation
      6. Final Project Folder
      7. User Manual
         1. Complete User Manual
         2. Complete System Manual
      8. Demonstration of the Full Working System
      9. Demonstration Agenda Sheet
   3. Closing & Evaluating Phase
      1. Post Implementation Review
      2. Reflective Review

## Statement of Work (SOW)

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1. | Planning | Group Ownership |
| Description | | |
| The planning phase encompasses many tasks. This phase cannot be completed until all subtasks are completed. Planning is the most important first step and, as such, its subtasks must be completed before their associated execution phase tasks. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 7 weeks | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.1. | Project Charter | Jane, Dell |
| Description | | |
| The project charter recognizes the existence of the project and provides direction on the project’s objectives and management | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 5 days | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.2. | Project Plan | Group Ownership |
| Description | | |
| The project plan should provide enough detail about the overall project so that a “new member” could read the document and understand how the project is being managed, the processes they need to follow, and the tasks they need to perform.  The project plan should provide an overview of the document and the project, a detailed description of how the project is organized, a statement of management and technical approaches to be used in the project, a comprehensive breakdown of the entire project lifecycle, a project schedule and any other relevant information required to understand the document. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 3 weeks | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.2.1. | Project Organization | Xing, Nicholas |
| Description | | |
| This section of the project plan describes how the project is organized. This includes an organizational chart, information about roles and responsibilities and other organizational processes. The organization chart should use a predetermined format (roles and persons assigned should be displayed in the chart). The roles described in the ‘Roles and Responsibilities’ section shuld match the roles given in the organizational chart. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 3 weeks (draft, review, final) | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.2.2. | Management and Technical Approaches | Xing, Nicholas |
| Description | | |
| This section of the project plan documents all management and technical processes to be used in the project. This section will adequately cover each of the nine project management elements: human resources, risk, communication, procurement, time, scope, quality, cost, and integration. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 3 weeks (draft, review, final) | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.2.3. | Work to be Done | Sean, Justin |
| Description | | |
| This section of the project plan must cover the entire project. It must clearly define all activities/tasks to be completed. Activities should be broken down to a level where an item can be completed in approximately one week. This section consists of a complete work breakdown structure (WBS) and partial statement of work (SOW). | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 3 weeks (draft, review, final) | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.2.3.1 | Work Breakdown Structure | Sean, Justin |
| Description | | |
| The work breakdown structure must clearly define all activities/tasks to be completed. Activities should be broken down to a level where an item can be completed in approximately one week. The work breakdown structure will be of hierarchical design with tasks composed of subtasks. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 3 weeks (draft, review, final) | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.2.3.2. | Statement of Work | Sean, Justin |
| Description | | |
| The statement of work will be formatted as a WBS dictionary. It will include fields indicating the WBS code number, WBS element name, owner(s) of the task, a description of the task, dependencies and an estimate of how long it should take to complete the task. | | |
| Dependencies | | |
| * 1.2.3.1 – Work Breakdown Structure | | |
| Time to Complete Estimate | | |
| 3 weeks (draft, review, final) | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.2.4. | Schedule | Dell |
| Description | | |
| The schedule consists of two Gantt charts.  The first is a summary Gantt chart which should display the schedule in a such a way that it is easy to see the whole project and be able to put into context the major parts of the work. The summary schedule must contain: a summary task for the whole project; a summary task for each of the phases; the main summary tasks for each of the major deliverables in each phase; milestones; columns are to include Task Name, Duration, Baseline Start and Baseline Finish.  The second is a detailed Gantt chart which should provide a visual way of seeing all the information to manage many aspects of the project down to an individual work item. The detailed schedule contains the same information as the summary schedule with the addition of: identification of all work items down to the implementation of a single screen; estimate of work require (in person-hours) for each work item; dependencies among the items; allocation of all work items to group members. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 2 weeks (draft, final) | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.2.4.1. | Schedule Meetings | Dell |
| Description | | |
| Meetings should be held regularly. This task should document the meeting schedule. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 1 day | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.2.4.2. | Schedule Deliverables | Dell |
| Description | | |
| Deliverables have specific deadlines. This task should document the deadline of each deliverable. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 1 day | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.2.4.3. | Schedule Work Breakdown Tasks | Dell |
| Description | | |
| The documents generated in task 1.2.3. – Work to be Done give details of each task required to complete the project. This task should document the duration, baseline start, and baseline finish of each task in the schedule. | | |
| Dependencies | | |
| * 1.2.3. – Work to be Done | | |
| Time to Complete Estimate | | |
| 2 weeks (draft, final) | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.3. | Software Requirements Specification | Jane |
| Description | | |
| The software requirements specification (SRS) will document the requirements for the software development that will take place. The SRS will consist of three sections and the appendices: Introduction; General Description; Specific Requirements; Appendices.  The SRS should be developed to ensure that the final system to come out of the project meets the needs of the client. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 2 weeks (draft, final) | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.3.1. | Use Case Specifications | Sean |
| Description | | |
| It is essential for the entire system to be modeled. Each use case description must have an associated use case diagram.  1.3.1.1. – Use Case Diagrams and 1.3.1.2. – Use Case Descriptions may be completed simultaneously but there must be collaboration before the final Use Case Specifications document can be completed to ensure there are no discrepancies. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 2 weeks (draft, final) | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.3.1.1. | Use Case Diagrams | Nicholas |
| Description | | |
| The use case diagrams must visually show the relationships between actors using the system, possible use cases, and the system boundary. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 1.5 weeks (draft, final) | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.3.1.2. | Use Case Descriptions | Sean |
| Description | | |
| Each use case diagram must be accompanied by a use case description (except in the case of a diagram used for an overview of the system). Each use case description must, in a table format, detail: a brief description, actors, precondition, main flow of events, alternative flow of events, post condition. | | |
| Dependencies | | |
| * 1.3.1.1 – Use Case Diagrams | | |
| Time to Complete Estimate | | |
| 1.5 weeks (draft, final) | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.3.2. | Supplementary Specifications | Justin |
| Description | | |
| Supplementary Specifications are an important complement to the Use Case Model as they capture the requirements that are not easily included, or do not fit into, a Use Case Model. Generally, non-functional aspects such as Performance or Security requirements are best left to this section. Any requirements that are not covered in the Use Case Model will need to be covered here. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 1 week | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.3.3. | Project Glossary | Xing, Jane |
| Description | | |
| The glossary is simply a collection of terms and definitions that the team can reference while creating and using the system requirements. This document will be the authoritative source for all terms and their definitions in the SRS. It will consist of a table with two columns: Term, Definition. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 1 week | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.3.4. | Sample Reports | Xing |
| Description | | |
| A sample report must be provided for each report defined in the business requirements. This will include showing how data is ‘grouped’ and totals (if there are totals for the report). | | |
| Dependencies | | |
| * 1.4.2.2. – Plan Reports | | |
| Time to Complete Estimate | | |
| 1 week. | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.4. | Design Planning | Group Ownership |
| Description | | |
| Before developing the system, there must be a well-structured and detailed plan for how each component of the system will be designed. When this phase is complete, there will be a comprehensive plan for designing the system leading to swift and accurate development. | | |
| Dependencies | | |
| * 1.3. – Software Requirements Specification | | |
| Time to Complete Estimate | | |
| 3 weeks (draft, review, final) | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.4.1. | Database Design Specification Planning | Justin |
| Description | | |
| The specification of the system should be completed in task 1.3. – Software Requirements Specification. This task will leverage task 1.3. to deliver a comprehensive plan for designing the database. | | |
| Dependencies | | |
| * 1.3.1.2. – Use Case Descriptions | | |
| Time to Complete Estimate | | |
| 3 weeks (draft, review, final) | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.4.1.1. | Plan Scripts | Nicholas |
| Description | | |
| Scripts are required to maintain and test the database. This task should plan how many scripts, what types of scripts, and how each script should be implemented and documented.. | | |
| Dependencies | | |
| * 1.3.1.2. – Use Case Descriptions | | |
| Time to Complete Estimate | | |
| 2 days | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.4.1.2. | Plan ER Diagram | Justin |
| Description | | |
| An ER Diagram is required to aid in the development of the database. This task should plan which style of ER Diagram will be designed, along with formatting and scope specifications. | | |
| Dependencies | | |
| * 1.3.1.2. – Use Case Descriptions | | |
| Time to Complete Estimate | | |
| 2 days | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.4.1.3. | Plan Data Dictionary | Justin |
| Description | | |
| A Data Dictionary is required to specify what sorts of data the database will contain and what its meaning is in the context of the overall system. This task should plan the layout, formatting and scope of the data dictionary. | | |
| Dependencies | | |
| * 1.4.1.2. – Plan ER Diagram | | |
| Time to Complete Estimate | | |
| 2 days | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.4.1.4. | Plan Table Mapping | Justin |
| Description | | |
| Table Mapping is a very important step to developing a complete database system. This task should plan the layout and formatting of the table mapping. | | |
| Dependencies | | |
| * 1.4.1.2. – Plan ER Diagram | | |
| Time to Complete Estimate | | |
| 2 days | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.4.1.5. | Plan Normalisation | Justin |
| Description | | |
| Normalization of individual database tables is important to maintain integrity of the database. This task should plan the level of normalization required for each table in the database | | |
| Dependencies | | |
| * 1.3.1.2. – Use Case Descriptions | | |
| Time to Complete Estimate | | |
| 1 day | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.4.1.6. | Plan Queries and Triggers | Justin |
| Description | | |
| Queries and Triggers allow the database to process data and interact with users. This task should plan the quantity, type, implementation and documentation of each query and trigger. | | |
| Dependencies | | |
| * 1.3.1.2. – Use Case Descriptions | | |
| Time to Complete Estimate | | |
| 3 days | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.4.2. | Web Interface Design Specification Planning | Sean |
| Description | | |
| The specification of the system should be completed in task 1.3. – Software Requirements Specification. This task will leverage task 1.3. to deliver a comprehensive plan for designing the web interface. | | |
| Dependencies | | |
| * 1.3.1.2. – Use Case Descriptions | | |
| Time to Complete Estimate | | |
| 2 weeks (draft, review, final) | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.4.2.1. | Plan Forms | Sean |
| Description | | |
| Forms allow users to interact with the system. This task will plan the quantity, type, implementation and documentation of each form. | | |
| Dependencies | | |
| * 1.3.1.2. – Use Case Descriptions | | |
| Time to Complete Estimate | | |
| 5 days | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.4.2.2. | Plan Reports | Sean |
| Description | | |
| Reports allow users to formally view data contained in the system. This task will plan the quantity, type, implementation and documentation of each report. | | |
| Dependencies | | |
| * 1.3.1.2. – Use Case Descriptions | | |
| Time to Complete Estimate | | |
| 3 days | | |

|  |  |  |  |
| --- | --- | --- | --- |
| WBS Code | | WBS Element | Owner |
| 1.4.3. | Backend Design Specification Planning | | Jane, Justin |
| Description | | | |
| The specification of the system should be completed in task 1.3. – Software Requirements Specification. This task will leverage task 1.3. to deliver a comprehensive plan for designing the backend of the system. | | | |
| Dependencies | | | |
| * 1.3.1.2. – Use Case Descriptions | | | |
| Time to Complete Estimate | | | |
| 3 weeks (draft, review, final) | | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.4.3.1. | Plan Business Logic | Jane, Justin |
| Description | | |
| Business logic constitutes the core of the backend. This task will plan how each component of the business logic will be designed and documented. | | |
| Dependencies | | |
| * 1.3.1.2. – Use Case Descriptions | | |
| Time to Complete Estimate | | |
| 2 weeks | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.4.3.1.1. | Plan Form Generation Methods | Jane, Justin |
| Description | | |
| Forms must be generated by the system. This task will plan the quantity, descriptions, implementation and documentation for each form generation method. | | |
| Dependencies | | |
| * 1.3.1.2. – Use Case Descriptions | | |
| Time to Complete Estimate | | |
| 3 days | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.4.3.1.2. | Plan Report Generation Methods | Jane, Justin |
| Description | | |
| Reports must be generated by the system. This task will plan the quantity, descriptions, implementation and documentation for each report generation method. | | |
| Dependencies | | |
| * 1.3.1.2. – Use Case Descriptions | | |
| Time to Complete Estimate | | |
| 3 days | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.4.4. | Integration Design Planning | Jane |
| Description | | |
| The specification of the system should be completed in task 1.3. – Software Requirements Specification. This task will leverage task 1.3. to deliver a comprehensive plan for designing the integration of the three main components of the system. | | |
| Dependencies | | |
| * 1.2.2. – Management and Technical Approaches * 1.4.1.6. – Plan Queries and Triggers * 1.4.3.1. – Plan Business Logic * 1.4.3.1.1. – Plan Form Generation Methods * 1.4.3.1.2. – Plan Report Generation Methods * 1.4.2.1. – Plan Forms * 1.4.2.2. – Plan Reports | | |
| Time to Complete Estimate | | |
| 3 weeks (draft, review, final) | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.4.4.1. | Database/Backend Integration Planning | Jane |
| Description | | |
| The database and backend must integrate seamlessly and flawlessly. This task will plan how each required component will be designed and documented. | | |
| Dependencies | | |
| * 1.2.2. – Management and Technical Approaches * 1.4.1.6. – Plan Queries and Triggers | | |
| Time to Complete Estimate | | |
| 5 days | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.4.4.2. | Backend/Web Interface Integration Planning | Jane |
| Description | | |
| The web interface and backed must integrate seamlessly and flawlessly. This task will plan how each required component will be designed and documented. | | |
| Dependencies | | |
| * 1.2.2. – Management and Technical Approaches * 1.4.3.1. – Plan Business Logic * 1.4.3.1.1. – Plan Form Generation Methods * 1.4.3.1.2. – Plan Report Generation Methods | | |
| Time to Complete Estimate | | |
| 5 days | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.4.4.3. | Plan Website Mapping | Jane |
| Description | | |
| The website mapping dictates how a user may navigate between screens of the website. This task will plan how website mapping will be documented, including label and diagram formatting, for later reference. | | |
| Dependencies | | |
| * 1.4.2.1. – Plan Forms * 1.4.2.2. – Plan Reports | | |
| Time to Complete Estimate | | |
| 3 days | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.4.5. | Test Design Planning | Nicholas |
| Description | | |
| All aspects of the system will be thoroughly tested. This task will plan how tests should be designed and documented. | | |
| Dependencies | | |
| * 1.3. – Software Requirements Specification * 1.4.1. – Database Design Specification Planning * 1.4.2. – Web Interface Design Specification Planning * 1.4.3. – Backend Design Specification Planning | | |
| Time to Complete Estimate | | |
| 1 week | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.4.5.1. | Plan Database Tests | Nicholas |
| Description | | |
| The database requires extensive testing to ensure integrity, accessibility, and modifiability of data. This task will plan the quantity, descriptions, implementation and documentation for database testing. | | |
| Dependencies | | |
| * 1.4.1.1. – Plan Scripts * 1.4.1.3. – Plan Data Dictionary * 1.4.1.4. – Plan Table Mapping * 1.4.1.5. – Plan Normalization * 1.4.1.6. – Plan Queries and Triggers | | |
| Time to Complete Estimate | | |
| 5 days | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.4.5.2. | Plan Backend Tests | Nicholas |
| Description | | |
| The system backend requires extensive testing to ensure business logic performs as specified. This task will plan the quantity, descriptions, implementation and documentation for backend testing. | | |
| Dependencies | | |
| * 1.4.3.1. – Plan Business Logic * 1.4.3.1.1. – Plan Form Generation Methods * 1.4.3.1.2. – Plan Report Generation Methods | | |
| Time to Complete Estimate | | |
| 5 days | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.4.5.3. | Plan Web Interface Tests | Nicholas |
| Description | | |
| The web interface requires extensive testing to ensure usability and completeness. This task will plan the quantity, descriptions, implementation and documentation for web interface testing. | | |
| Dependencies | | |
| * 1.4.4.3. – Plan Website Mapping | | |
| Time to Complete Estimate | | |
| 5 days | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.4.5.4. | Plan Integration Tests | Nicholas |
| Description | | |
| The integration of the three main components of the system requires extensive testing to ensure seamless and flawless behavior between the systems. This task will plan the quantity, descriptions, implementation and documentation for integration testing. | | |
| Dependencies | | |
| * 1.4.4.1. – Database/Backend Integration Planning * 1.4.4.2. – Backend/Web Interface Integration Planning * 1.4.4.3. – Plan Website Mapping | | |
| Time to Complete Estimate | | |
| 5 days | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.5. | Development Planning | Justin |
| Description | | |
| Development of the system requires a plan to indicate resources needed to implement each task as well as standards for quality in implementation and presentation. This task will develop a plan allowing developers to be consistent. | | |
| Dependencies | | |
| * 1.2.2. – Management and Technical Approaches | | |
| Time to Complete Estimate | | |
| 2 weeks | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.5.1. | Database Development Planning | Justin |
| Description | | |
| This task will plan for resources and quality assurance standards in developing a large-scale database. | | |
| Dependencies | | |
| * 1.2.2. – Management and Technical Approaches | | |
| Time to Complete Estimate | | |
| 1 week | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.5.2. | Web Interface Development Planning | Justin |
| Description | | |
| This task will plan for resources and quality assurance standards in developing a web interface that will be used by persons of varying experience and roles. | | |
| Dependencies | | |
| * 1.2.2. – Management and Technical Approaches | | |
| Time to Complete Estimate | | |
| 1 week | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 1.5.3. | Backend Development Planning | Justin |
| Description | | |
| This task will plan for resources and quality assurance standards in developing the backend for a large-scale database-driven web application. | | |
| Dependencies | | |
| * 1.2.2. – Management and Technical Approaches | | |
| Time to Complete Estimate | | |
| 1 week | | |

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| WBS Code | WBS Element | Owner |
| 1.5.4. | Integration Development Planning | Justin |
| Description | | |
| This task will plan for resources and quality assurance standards in integrating a database, code backend, and web interface seamlessly in a large-scale application. | | |
| Dependencies | | |
| * 1.2.2. – Management and Technical Approaches | | |
| Time to Complete Estimate | | |
| 1 week | | |

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| WBS Code | WBS Element | Owner |
| 1.5.5. | Test Development Planning | Nicholas |
| Description | | |
| This task will plan for resources and quality assurance standards in developing rigorous tests for the three main components of the system and the hundreds of components therein. | | |
| Dependencies | | |
| * 1.2.2. – Management and Technical Approaches | | |
| Time to Complete Estimate | | |
| 1 week | | |

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| WBS Code | WBS Element | Owner |
| 2 | Execution | Group |
| Description | | |
| Execute the project. The project is divided into two parts: Design and Development.  In the design section, the elements of the project will be designed and be developed in the development section. | | |
| Dependencies | | |
| * 1 – Planning | | |
| Time to Complete Estimate | | |
| 11 weeks | | |

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| WBS Code | WBS Element | Owner |
| 2.1 | Execute Design | Group |
| Description | | |
| Design the concepts of the project’s object. The objects include Database, Web Interface, Backend, Integration and Test. Each item will be designed in order to match the specification and provide a blueprint for development. | | |
| Dependencies | | |
| * 1.4 – Design Planning | | |
| Time to Complete Estimate | | |
| 4.5 weeks | | |

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| WBS Code | WBS Element | Owner |
| 2.1.1 | Execute Database Design | Justin |
| Description | | |
| Design the concepts and structure of database including Scripts, ER Diagram, Data Dictionary, Table Mapping and Queries/Triggers. The database will be visualized by the processes. | | |
| Dependencies | | |
| * 1.4.1 – Database Design Specification Planning | | |
| Time to Complete Estimate | | |
| 6 days | | |

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| WBS Code | WBS Element | Owner |
| 2.1.1.1 | Design Scripts | Nicholas |
| Description | | |
| Design the scripts used for maintaining and recovery the database. The scripts include create/drop table, populate data, create views, join tables and queries stated in the specification. | | |
| Dependencies | | |
| * 1.4.1.1 – Plan Scripts | | |
| Time to Complete Estimate | | |
| 1 day | | |

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| WBS Code | WBS Element | Owner |
| 2.1.1.2 | Design ER Diagram | Nicholas |
| Description | | |
| Design the Entity-Relationship Diagram according to the specification. | | |
| Dependencies | | |
| * 1.4.1.2 – Plan ER Diagram | | |
| Time to Complete Estimate | | |
| 2 days | | |

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| WBS Code | WBS Element | Owner |
| 2.1.1.3 | Design Data Dictionary | Justin |
| Description | | |
| Design the Data Dictionary according to the specification. | | |
| Dependencies | | |
| * 1.4.1.3 – Plan Data Dictionary | | |
| Time to Complete Estimate | | |
| 1 day | | |

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| WBS Code | WBS Element | Owner |
| 2.1.1.4 | Design Table Mapping | Justin |
| Description | | |
| Map the ER schema into Relational schema and specify all primary keys and foreign keys. The normalization should also be processed in order to create a well-defined schema. | | |
| Dependencies | | |
| * 1.4.1.4 – Plan Table Mapping * 1.4.1.5 – Plan Normalization | | |
| Time to Complete Estimate | | |
| 1 day | | |

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| WBS Code | WBS Element | Owner |
| 2.1.1.5 | Design Queries/Triggers | Justin |
| Description | | |
| Design queries and triggers that will be used for operating the database according to the specification. | | |
| Dependencies | | |
| * 1.4.1.6 – Plan Queries and Triggers | | |
| Time to Complete Estimate | | |
| 1 day | | |

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| WBS Code | WBS Element | Owner |
| 2.1.2 | Execute Web Interface Design | Sean |
| Description | | |
| Design the web interface for users. The web interface includes forms and reports that will allow users to input and retrieve data. The input and output should match the user requirements stated in the specification. The presentation of the web pages is also designed in this process. | | |
| Dependencies | | |
| * 1.4.2 – Web Interface Design Specification Planning | | |
| Time to Complete Estimate | | |
| 3 days | | |

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| WBS Code | WBS Element | Owner |
| 2.1.2.1 | Design Forms | Sean |
| Description | | |
| Design forms for users to input data according to the user requirements stated in the specification. The format of the forms should be clear and uniform. | | |
| Dependencies | | |
| * 1.4.2.1 – Plan Forms | | |
| Time to Complete Estimate | | |
| 1 day | | |

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| WBS Code | WBS Element | Owner |
| 2.1.2.2 | Design Reports | Sean |
| Description | | |
| Design reports to present data retrieved from database according to the user requirements stated in the specification. The format of the reports should be clear and uniform. | | |
| Dependencies | | |
| * 1.4.2.2 – Plan Reports | | |
| Time to Complete Estimate | | |
| 1 day | | |

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| WBS Code | WBS Element | Owner |
| 2.1.2.3 | Design Presentation | Sean |
| Description | | |
| Design the web pages presentation. The web pages include forms, reports and other pages used for the website. The presentation should be clear and suitable for the company and each pages should be presented in the same way (uniform). | | |
| Dependencies | | |
| * 2.1.2.1 – Design Forms * 2.1.2.2 – Design Reports | | |
| Time to Complete Estimate | | |
| 1 day | | |

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| WBS Code | WBS Element | Owner |
| 2.1.3 | Execute Backend Design | Jane, Justin |
| Description | | |
| Design the concepts and functions of the backend. The concepts of the objects model including methods and the functions required for the system should be designed in this section. The functions include forms, reports and queries generation/retrieval methods. All the functions should perform the tasks stated in the specification. | | |
| Dependencies | | |
| * 1.4.3 – Backend Design Specification Planning | | |
| Time to Complete Estimate | | |
| 1 week | | |

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| WBS Code | WBS Element | Owner |
| 2.1.3.1 | Design Business Logic | Jane, Justin |
| Description | | |
| Design Business Logic to represents the business objects. The design should satisfy the requirements stated in the specification. | | |
| Dependencies | | |
| * 1.4.3.1 – Plan Business Logic | | |
| Time to Complete Estimate | | |
| 5 days | | |

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| WBS Code | WBS Element | Owner |
| 2.1.3.2 | Design Form Generation Methods | Jane, Justin |
| Description | | |
| Design functions used for generating required forms. This includes designing what the functions are required to perform and how the functions are going to do in order to achieve requirements. The design should provide a blueprint and instruction for development. | | |
| Dependencies | | |
| * 1.4.3.1.1 – Plan Form Generation Methods * 2.1.3.1 – Design Business Logic | | |
| Time to Complete Estimate | | |
| 1 day | | |

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| WBS Code | WBS Element | Owner |
| 2.1.3.3 | Design Report Generation Methods | Jane, Justin |
| Description | | |
| Design functions used for generating required reports. This includes designing what the functions are required to perform and how the functions are going to do in order to achieve requirements. The design should provide a blueprint and instruction for development. | | |
| Dependencies | | |
| * 1.4.3.1.2 – Plan Report Generation Methods * 2.1.3.1 – Design Business Logic | | |
| Time to Complete Estimate | | |
| 1 day | | |

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| WBS Code | WBS Element | Owner |
| 2.1.4 | Execute Integration Design | Jane |
| Description | | |
| Design the blueprint and instruction of integration including Database/Backend Integration, Backend/Web Interface Integration and Web Interface Integration. The objects and functions/methods should be included in each part. | | |
| Dependencies | | |
| * 1.4.4 – Integration Design Planning | | |
| Time to Complete Estimate | | |
| 1 week | | |

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| WBS Code | WBS Element | Owner |
| 2.1.4.1 | Design Database Configuration | Jane |
| Description | | |
| Design the blueprint and instruction of integrating Database and Backend. The objects and functions/methods of integration should be included in this section. The objects in this part are connection and sending/retrieving queries. The way of how to communicate between Database and Backend regarding to the objects should be designed. | | |
| Dependencies | | |
| * 1.4.4.1 – Database/Backend Integration Planning | | |
| Time to Complete Estimate | | |
| 4 days | | |

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| WBS Code | WBS Element | Owner |
| 2.1.4.2 | Design Website Mapping | Jane, Justin |
| Description | | |
| Design the hierarchy of the web pages including forms, reports and other pages. The frame of the website and website mapping are included in this section. The design should provide a blueprint and instruction for development. | | |
| Dependencies | | |
| * 1.4.4.3 – Plan Website Mapping | | |
| Time to Complete Estimate | | |
| 1 day | | |

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| WBS Code | | WBS Element | | Owner |
| 2.1.5 | Execute Test Design | | Nicholas | |
| Description | | | | |
| Design a blueprint and instruction of tests for each part of the projects. The tests include Unit Tests, Function Tests and Requirements Tests. The way of how to perform the test regarding to the testing object should be included in this section. All the tests should effectively test the object whether the object is satisfied the requirements stated in the specification. | | | | |
| Dependencies | | | | |
| * 1.4.5 – Test Design Planning | | | | |
| Time to Complete Estimate | | | | |
| 6 days | | | | |

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| WBS Code | WBS Element | Owner |
| 2.1.5.1 | Design Unit Tests | Nicholas |
| Description | | |
| Design tests to test the units of each part of the projects according to the Test Design Plan. The variables and functions/methods for the test should also be designed. This includes designing what the functions are required to perform, how the functions are going to do in order to achieve requirements and what the result should be. The design should provide a blueprint and instruction for development. | | |
| Dependencies | | |
| * 1.4.5.1 – Plan Database Tests * 1.4.5.2 – Plan Backend Tests * 1.4.5.3 – Plan Web Interface Tests * 1.4.5.4 – Plan Integration Tests | | |
| Time to Complete Estimate | | |
| 2 days | | |

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| WBS Code | WBS Element | Owner |
| 2.1.5.2 | Design Functionality Tests | Nicholas |
| Description | | |
| Design tests to test the functionality of each part of the projects according to the Test Design Plan. The variables and functions/methods for the test should also be designed. This includes designing what the functions are required to perform, how the functions are going to do in order to achieve requirements and what the result should be. The design should provide a blueprint and instruction for development. | | |
| Dependencies | | |
| * 1.4.5.1 – Plan Database Tests * 1.4.5.2 – Plan Backend Tests * 1.4.5.3 – Plan Web Interface Tests * 1.4.5.4 – Plan Integration Tests | | |
| Time to Complete Estimate | | |
| 2 days | | |

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| WBS Code | WBS Element | Owner |
| 2.1.5.3 | Design Requirements Tests | Nicholas |
| Description | | |
| Design tests to test the requirements satisfactory of each part of the projects according to the Test Design Plan. The variables and functions/methods for the test should also be designed. This includes designing what the functions are required to perform, how the functions are going to do in order to achieve requirements and what the result should be. The design should provide a blueprint and instruction for development. | | |
| Dependencies | | |
| * 1.4.5.1 – Plan Database Tests * 1.4.5.2 – Plan Backend Tests * 1.4.5.3 – Plan Web Interface Tests * 1.4.5.4 – Plan Integration Tests | | |
| Time to Complete Estimate | | |
| 2 days | | |

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| WBS Code | WBS Element | Owner |
| 2.2 | Execute Development | Justin |
| Description | | |
| Develop the project’s object according to the blueprint and instruction designed from the design phase. The objects include Database, Web Interface, Backend, Integration and Test. Each item will be developed in order to match the specification and effectively perform the designed functions. | | |
| Dependencies | | |
| * 2.1 – Execute Design | | |
| Time to Complete Estimate | | |
| 6 weeks | | |
|  | | |
| WBS Code | WBS Element | Owner |
| 2.2.1 | Database Development | Justin |
| Description | | |
| Develop the Database including scripts used for the maintenance, all the tables, views and triggers. The Database should be able to effectively perform the functionality and satisfy the requirements stated in the specification. The development should follow the blueprint and instruction developed in the design phase. | | |
| Dependencies | | |
| * 2.1.1 – Execute Database Design | | |
| Time to Complete Estimate | | |
| 6 days | | |

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| WBS Code | WBS Element | Owner |
| 2.2.1.1 | Develop Scripts | Justin |
| Description | | |
| Develop the scripts following the blueprint and instruction developed in the design phase. The scripts should effectively perform the functionality and satisfy the requirements stated in the specification. The scripts include creating/dropping tables and views, populating data. | | |
| Dependencies | | |
| * 2.1.1.1 – Design Scripts * 2.2.1.2 – Develop Database | | |
| Time to Complete Estimate | | |
| 1 day | | |

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| WBS Code | WBS Element | Owner |
| 2.2.1.2 | Develop Database | Justin |
| Description | | |
| Develop the whole Database including all the tables and data. The development should follow the blueprint and instruction developed in the design phase. The database should be able to store and retrieve required data. | | |
| Dependencies | | |
| * 2.1.1.2 – Design ER Diagram * 2.1.1.3 – Design Data Dictionary * 2.1.1.4 – Design Table Mapping * 2.1.1.5 – Design Queries and Triggers | | |
| Time to Complete Estimate | | |
| 3 days | | |

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| WBS Code | WBS Element | Owner |
| 2.2.1.3 | Develop Triggers | Nicholas |
| Description | | |
| Develop triggers according to the blueprint and instruction developed in the design phase. | | |
| Dependencies | | |
| * 2.2.1.2 – Develop Database | | |
| Time to Complete Estimate | | |
| 2 days | | |

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| WBS Code | WBS Element | Owner |
| 2.2.2 | Execute Web Interface Development | Sean |
| Description | | |
| Develop the Web Interface including the forms and reports. The development should follow the blueprint and instruction developed in the design phases. All the forms and reports should satisfy the user requirements stated in the specification. | | |
| Dependencies | | |
| * 2.1.2 – Execute Web Interface Design | | |
| Time to Complete Estimate | | |
| 6 days | | |

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| WBS Code | WBS Element | Owner |
| 2.2.2.1 | Develop Forms | Sean |
| Description | | |
| Develop web forms for users to input data. The development should follow the blueprint and instruction developed in the design phases. All the forms should be able to allow users to input required data. The presentation of the forms should be uniform and follow the instruction of the design of the presentation. | | |
| Dependencies | | |
| * 2.1.2.3 – Design Presentation | | |
| Time to Complete Estimate | | |
| 3 days | | |

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| WBS Code | WBS Element | Owner |
| 2.2.2.2 | Develop Reports | Sean |
| Description | | |
| Develop web reports to present user required data. The development should follow the blueprint and instruction developed in the design phases. All the reports should be able present user required data properly. This means the data user required should be presented. The presentation of the forms should be uniform and follow the instruction of the design of the presentation. | | |
| Dependencies | | |
| * 2.1.2.3 – Design Presentation | | |
| Time to Complete Estimate | | |
| 3 days | | |

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| WBS Code | WBS Element | Owner |
| 2.2.3 | Execute Backend Development | Jane, Justin |
| Description | | |
| Develop the backend of the system including the Model of Objects/Methods, Form Generation Methods, Form Retrieval Methods, Report Generation Methods and Query Generation Methods. The development of each part should follow the blueprint and instruction developed in the design phase and effectively perform the functionality and satisfy the requirements stated in the specification. | | |
| Dependencies | | |
| * 2.1.3 – Execute Backend Design | | |
| Time to Complete Estimate | | |
| 2.5 weeks | | |

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| WBS Code | WBS Element | Owner |
| 2.2.3.1 | Develop Model Objects/Methods | Jane, Justin |
| Description | | |
| Develop data objects/methods which represent the data in the system. The development should follow the blueprint and instruction developed in the design phase. | | |
| Dependencies | | |
| * 2.1.3.1 – Design Business Logic | | |
| Time to Complete Estimate | | |
| 3 days | | |

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| WBS Code | WBS Element | Owner |
| 2.2.3.2 | Develop Form Generation Methods | Jane, Justin |
| Description | | |
| Develop form generation methods. The development should follow the blueprint and instruction developed in the design phase. | | |
| Dependencies | | |
| * 2.1.3.2 – Design Form Generation Methods | | |
| Time to Complete Estimate | | |
| 3 days | | |

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| WBS Code | WBS Element | Owner |
| 2.2.3.3 | Develop From Retrieval Methods | Jane, Justin |
| Description | | |
| Develop form retrieval methods. The development should follow the blueprint and instruction developed in the design phase. | | |
| Dependencies | | |
| * 2.1.3.2 – Design Form Generation Methods | | |
| Time to Complete Estimate | | |
| 3 days | | |

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| WBS Code | WBS Element | Owner |
| 2.2.3.4 | Develop Report Generation Methods | Jane, Justin |
| Description | | |
| Develop report generation methods. The development should follow the blueprint and instruction developed in the design phase. | | |
| Dependencies | | |
| * 2.1.3.3 – Design Report Generation Methods | | |
| Time to Complete Estimate | | |
| 3 days | | |

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| WBS Code | WBS Element | Owner |
| 2.2.3.5 | Develop DAO Methods | Jane, Justin |
| Description | | |
| Develop DAO methods. The development should follow the blueprint and instruction developed in the design phase. | | |
| Dependencies | | |
| * 2.1.3.2 – Design Form Generation Methods | | |
| Time to Complete Estimate | | |
| 3 days | | |

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| WBS Code | WBS Element | Owner |
| 2.2.4 | Execute Integration Development | Sean |
| Description | | |
| Integrate Database, Backend and Web Interface together. The web pages including forms and reports are also required to be linked together in this section. The integration should follow the blueprint and instruction developed in the design phase. All the parts of the project should be able to work together properly and perform the functionality and satisfy the requirements stated in the specification. | | |
| Dependencies | | |
| * 2.1.4 – Execute Integration Design | | |
| Time to Complete Estimate | | |
| 2 weeks | | |

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| WBS Code | WBS Element | Owner |
| 2.2.4.1 | Develop Database Configuration | Sean |
| Description | | |
| Integrate Database and Backend. This task includes develop the database connection objects/methods and database query send/retrieve methods. The development should follow the design and instruction developed in the design phase. | | |
| Dependencies | | |
| * 2.1.4.1 – Design Database Configuration | | |
| Time to Complete Estimate | | |
| 6 days | | |

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| WBS Code | WBS Element | Owner |
| 2.2.4.2 | Develop Web Server Configuration | Jane, Justin |
| Description | | |
| Develop the web server configuration. The development should follow the design and instruction developed in the design phase. The configuration should effectively handle the connection between backend and web server. | | |
| Dependencies | | |
|  | | |
| Time to Complete Estimate | | |
| 3 days | | |

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| WBS Code | WBS Element | Owner |
| 2.2.4.3 | Develop Website Mapping | Sean |
| Description | | |
| Map all the pages of the website together in order to satisfy the consistency of the website. The development should follow the design and instruction developed in the design phase. | | |
| Dependencies | | |
| * 2.1.4.2 – Design Website Mapping | | |
| Time to Complete Estimate | | |
| 2 days | | |

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| WBS Code | WBS Element | Owner |
| 2.2.5 | Execute Test Development | Nicholas |
| Description | | |
| Develop the tests to test the system. The tests include Unit Tests, Functionality Tests and Requirement Tests. The development should follow the blueprint and instruction developed in the design phase. The tests should be able to test the system effectively to see whether the system is satisfy the requirements and work properly. | | |
| Dependencies | | |
| * 2.1.5 – Execute Test Design | | |
| Time to Complete Estimate | | |
| 1 week | | |

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| WBS Code | WBS Element | Owner |
| 2.2.5.1 | Unit Tests | Nicholas |
| Description | | |
| Develop Unit Tests in order to test the units of the system. The development should follow the blueprint and instruction of developed in the design phase. The Unit Tests should be able to test all units of the system effectively. | | |
| Dependencies | | |
| * 2.1.5.1 – Design Unit Tests | | |
| Time to Complete Estimate | | |
| 3 days | | |

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| WBS Code | WBS Element | Owner |
| 2.2.5.2 | Functionality Tests | Nicholas |
| Description | | |
| Develop Functionality Tests in order to test the functionality for each part of the system. The development should follow the blueprint and instruction of developed in the design phase. The Functionality Tests should be able to test the functionality for each part of the system effectively. | | |
| Dependencies | | |
| * 2.1.5.2 – Design Functionality Tests | | |
| Time to Complete Estimate | | |
| 3 days | | |

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| WBS Code | WBS Element | Owner |
| 2.2.5.3 | Requirements Tests | Nicholas |
| Description | | |
| Develop Requirements Tests in order to test the requirements for each part of the system. The development should follow the blueprint and instruction of developed in the design phase. The Requirements Tests should be able to test the requirements for each part of the system effectively. | | |
| Dependencies | | |
| * 2.1.5.3 – Design Requirements Tests | | |
| Time to Complete Estimate | | |
| 3 days | | |

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| WBS Code | WBS Element | Owner |
| 3. | Controlling | Group Ownership |
| Description | | |
| The controlling phase contains tasks which specify protocol and overall project management documentation. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| Total Length of Project | | |

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| WBS Code | WBS Element | Owner |
| 3.1. | Have Meetings | Group Ownership |
| Description | | |
| It is necessary to hold meetings regularly to keep all members of the group informed of when tasks must be completed, which tasks have been completed and delegating further tasks. Meetings also provide a time for members to express concern or praise about the work of other members and themselves. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 1 hour (once per week for the total length of the project) | | |

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| WBS Code | WBS Element | Owner |
| 3.1.1. | Take Minutes | Rotation |
| Description | | |
| The minutes of each meeting should be recorded so that members may remind themselves of what was discussed at each meeting. The minutes should describe actions and outcomes discussed. | | |
| Dependencies | | |
| * 3.1. – Have Meetings | | |
| Time to Complete Estimate | | |
| 1 hour (once per week for the total length of the project) | | |

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| WBS Code | WBS Element | Owner |
| 3.2. | Progress Management | Dell, Jane |
| Description | | |
| Progress management allows the group to keep track of the progress of the project. This is important to keep on schedule and satisfy the software requirements | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| Total Length of Project | | |

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| WBS Code | WBS Element | Owner |
| 3.2.1. | Project Status Reports | Dell |
| Description | | |
| Project status reports keep group members and project stakeholders informed of the project’s status on a regular basis. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 3 days (once per fortnight for the total length of the project) | | |

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| WBS Code | WBS Element | Owner |
| 3.2.2. | Project Performance Reports | Dell |
| Description | | |
| Project performance reports keep group members and project stakeholders informed of what the project team has accomplished in a certain period of time. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 3 days (once per fortnight for the total length of the project) | | |

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| WBS Code | WBS Element | Owner |
| 3.2.3. | Project Forecasting | Dell |
| Description | | |
| Project forecasting predicts future status based on past information and trends. This information keeps stakeholders engaged and project members looking forward. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 3 days (once per fortnight for the total length of the project) | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 3.3. | Change Management | Dell |
| Description | | |
| Change Management is important to limit scope creep and continue the frequent and open communication between group members and stakeholders. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 3 days (as necessary during the length of the project) | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 3.3.1. | Change Request Documentation | Person Requesting Change |
| Description | | |
| Change request documentation is necessary to keep a record of what changes have been requested, by whom, and on what date. The change request should be as detailed as possible to avoid ambiguity. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 1 day (as necessary during the length of the project) | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 3.3.2. | Change Request Review | Group Ownership |
| Description | | |
| After a change request is lodged, it must be reviewed for feasibility. Those members whom the change would affect should be present for review. | | |
| Dependencies | | |
| * 3.3.1. – Change Request Documentation | | |
| Time to Complete Estimate | | |
| 1 day (as necessary during the length of the project) | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 3.3.3. | Change Request Approval | Dell & key stakeholder |
| Description | | |
| After a change has been reviewed, it must be presented for approval. The project manager should present the approval documentation as well as the change request documentation to a key stakeholder for signing. | | |
| Dependencies | | |
| * 3.3.2. – Change Request Review | | |
| Time to Complete Estimate | | |
| 1 day (as necessary during the length of the project) | | |

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| WBS Code | WBS Element | Owner |
| 3.4. | Deliverables Management | Group Ownership |
| Description | | |
| Deliverables management sets out the protocol for presenting a final deliverable. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 3 weeks (as necessary during the length of the project) | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 3.4.1. | Draft | Group Ownership |
| Description | | |
| A draft of each member’s component of the deliverable must be presented to the group along with a verbal progress report. It is expected that, at this stage, each component be at least 50% complete. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 1 week (as necessary during the length of the project) | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 3.4.2. | Review | Group Ownership |
| Description | | |
| After each draft is presented to the group, members will continue progress on their component of the deliverable. A review will be held the following week after the draft. It is expected that, at this stage, each component be at least 90% complete. | | |
| Dependencies | | |
| * 3.4.1. – Draft | | |
| Time to Complete Estimate | | |
| 1 week (as necessary during the length of the project) | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 3.4.3. | Finalize | Group Ownership |
| Description | | |
| After each component has been reviewed, members will complete their component of the deliverable and polish off the presentation for consistency with quality checks. It is expected that, at this stage, each component be at least 99% complete. | | |
| Dependencies | | |
| * 3.4.2. – Review | | |
| Time to Complete Estimate | | |
| 1 week (as necessary during the length of the project) | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 3.5. | Project Reporting | Dell |
| Description | | |
| Project reporting is a management tool to help group members and stakeholders to monitor the project and its progress. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 5 days (every fortnight throughout the length of the project) | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 3.5.1. | Project Reporting 1 | Justin & Group |
| Description | | |
| Project Reporting 1 is required at the same time as 4.1. – Project Plan.  See “Project Deliverables Requirements” page 47 for information about reporting requirements. | | |
| Dependencies | | |
| * 4.1. – Project Plan | | |
| Time to Complete Estimate | | |
| 5 days | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 3.5.2. | Project Reporting 2 | Dell & Group |
| Description | | |
| Project Reporting 2 is required at the same time as 4.2. – Software Requirements Specification.  See “Project Deliverables Requirements” page 47 for information about reporting requirements. | | |
| Dependencies | | |
| * 4.2. – Software Requirements Specification | | |
| Time to Complete Estimate | | |
| 5 days | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 3.5.3. | Project Reporting 3 | Dell & Group |
| Description | | |
| Project Reporting 3 is required at the same time as 4.1.3. – Entity Relationship Diagram and 4.1.4. – Test Cases and Results.  See “Project Deliverables Requirements” page 47 for information about reporting requirements. | | |
| Dependencies | | |
| * 4.1.3. – Entity Relationship Diagram * 4.1.4. – Test Cases and Results | | |
| Time to Complete Estimate | | |
| 5 days | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 3.5.4. | Project Reporting 4 | Dell & Group |
| Description | | |
| Project Reporting 4 is required at the same time as 4.2.1. – Individual Component(s) Agreements.  See “Project Deliverables Requirements” page 47 for information about reporting requirements. | | |
| Dependencies | | |
| * 4.2.1. – Individual Component(s) Agreements | | |
| Time to Complete Estimate | | |
| 5 days | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 3.5.5. | Project Reporting 5 | Dell & Group |
| Description | | |
| Project Reporting 5 is required after delivering 4.2.2. – Test Plan.  See “Project Deliverables Requirements” page 47 for information about reporting requirements. | | |
| Dependencies | | |
| * 4.2.2. – Test Plan | | |
| Time to Complete Estimate | | |
| 5 days | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 3.5.6. | Project Reporting 6 | Dell & Group |
| Description | | |
| Project Reporting 6 is required before delivering 4.2.3. – Demonstration of the individual component(s).  See “Project Deliverables Requirements” page 47 for information about reporting requirements. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 5 days | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 3.5.7. | Project Reporting 7 | Dell & Group |
| Description | | |
| Project Reporting 7 is required before 4.2.4. – Proven Use of Project Plan & SRS.  See “Project Deliverables Requirements” page 47 for information about reporting requirements. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 5 days | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 3.5.8. | Project Reporting 8 | Dell & Group |
| Description | | |
| Project Reporting 8 is required before 4.2.5. – Project Analysis Presentation.  See “Project Deliverables Requirements” page 47 for information about reporting requirements. | | |
| Dependencies | | |
| * None | | |
| Time to Complete Estimate | | |
| 5 days | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 3.5.9. | Project Reporting 9 | Dell & Group |
| Description | | |
| Project Reporting 9 is required at the same time as 4.2.6. – Final Project Folder, 4.2.7.1. – Complete User Manual, 4.2.7.2. – Complete System Manual, 4.2.9. – Demonstration Agenda Sheet.  See “Project Deliverables Requirements” page 47 for information about reporting requirements. | | |
| Dependencies | | |
| * 4.2.6. – Final Project Folder * 4.2.7.1. – Complete User Manual * 4.2.7.2. – Complete System Manual * 4.2.9. – Demonstration Agenda Sheet | | |
| Time to Complete Estimate | | |
| 5 days | | |

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| WBS Code | WBS Element | Owner |
| 4 | Project Deliverables | Xing |
| Description | | |
| Prepare documentations of the project for each phase. Prototype the system during the project development process is also required. The phases of the project development are Planning Phase, Execution & Controlling Phase and Closing & Evaluating Phase. | | |
| Dependencies | | |
| * 1 – Planning * 2 – Execution * 3 – Controlling | | |
| Time to Complete Estimate | | |
| 4.5 weeks | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 4.1 | Planning Phase | Xing |
| Description | | |
| Prepare documentations for the project planning phase. The documents include plan, specifications for the system, test cases and design. A prototype of the system is also required in this phase. | | |
| Dependencies | | |
| * 1 – Planning | | |
| Time to Complete Estimate | | |
| 2 weeks | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 4.1.1 | Project Plan | Xing & Group |
| Description | | |
| Provide details of the project so that project members could read the document and understand how the project is being managed and the processes they need to follow. The project plan should contain an introduction, how the project is organized, management and technical approaches and work to be completed for the entire project. | | |
| Dependencies | | |
| * 1.2 – Project Plan | | |
| Time to Complete Estimate | | |
| 4 days | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 4.1.2 | Software Requirements Specification | Xing |
| Description | | |
| Document the requirements for the software development that will take place. The software requirements specification should consist of three sections and the appendices, they are introduction, general description, specific requirements (documented as Use Case Specifications along with Supplementary Specifications) and appendices of project glossary and sample reports…etc. | | |
| Dependencies | | |
| * 1.3 – Software Requirements Specification | | |
| Time to Complete Estimate | | |
| 4 days | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 4.1.3 | Entity Relationship Diagram | Nicholas. Justin |
| Description | | |
| Document the database design as an Entity Relationship (ER) or Extended Entity Relationship (EER) diagram. The diagram should cover all information being stored in the database. In addition to the design, the relational schema mapping of the diagram and estimation of the size of the database are required to be provided. | | |
| Dependencies | | |
| * 2.1.1.2 – Design ER Diagram | | |
| Time to Complete Estimate | | |
| 1 day | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 4.1.4 | Test Cases & Results | Nicholas |
| Description | | |
| Design test cases for the working components implemented in the current phase. The test cases are also required to be executed and the results should be recorded. The development of test cases should base on the development of the components and interfaces. | | |
| Dependencies | | |
| * 1.3 – Software Requirements Specification | | |
| Time to Complete Estimate | | |
| 2 days | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 4.1.5 | Recovery Scripts and Demonstration | Xing |
| Description | | |
| Develop SQL scripts that can be run in SQL\*Plus or Toad without error. The scripts should be able to create/populate/drop all the tables used in the database.  Develop a prototype to justify the design/architecture/platform of the system. The functionality of the system should meet the basic requirements according to the specification. | | |
| Dependencies | | |
| * 1.3 – Software Requirements Specification | | |
| Time to Complete Estimate | | |
| 1 day | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 4.2 | Execution & Controlling Phase | Xing |
| Description | | |
| Prepare documentations for the project execution & controlling phase. The documents include individual component(s) agreements, test plan, project analysis, user manual and final project folder. The final working system is also required in this phase and the use of project plan and software requirements specifications are required to prove. | | |
| Dependencies | | |
| * 2 – Execution * 3 – Controlling | | |
| Time to Complete Estimate | | |
| 3 weeks | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 4.2.1 | Individual Component(s) Agreements | Xing |
| Description | | |
| Document the lists of the individual components that each team member is individually responsible for. Each team member must select component(s) that they will be fully responsible for. | | |
| Dependencies | | |
| * 1.3 – Software Requirements Specification | | |
| Time to Complete Estimate | | |
| 1 day | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 4.2.2 | Test Plan | Xing, Nicholas |
| Description | | |
| Develop a test plan for the entire system. The test plan contains introduction, testing strategy, assumptions and constraints and test cases. The document should address testing for the entire project. | | |
| Dependencies | | |
| * 1.3 – Software Requirements Specification * 1.4.5 – Test Design Planning | | |
| Time to Complete Estimate | | |
| 2 days | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 4.2.3 | Demonstration of Individual Component(s) | Each individual |
| Description | | |
| Demonstrate the component(s) each team member is responsible for. Each team member should develop a working component(s) that the functions perform as required. | | |
| Dependencies | | |
| * 2.1 Execute Design | | |
| Time to Complete Estimate | | |
| 1 day | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 4.2.4 | Proven Use of Project Plan & SRS | Xing |
| Description | | |
| Prove the team has made use of the project plan and show how the team has incorporated the feedback received after submitting the document in the previous phase. The use of the Software Requirements Specification (SRS) is also required to be proved. | | |
| Dependencies | | |
| * 1.3 – Software Requirements Specification | | |
| Time to Complete Estimate | | |
| 1 day | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 4.2.5 | Project Analysis Presentation | Xing |
| Description | | |
| Review and analysis the project for improving future projects. The STAR (situation, task, action and result) analysis method should be used when discussing the project. | | |
| Dependencies | | |
| * 2 – Execution * 3 – Controlling | | |
| Time to Complete Estimate | | |
| 4 days | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 4.2.6 | Final Project Folder | Xing, whole team |
| Description | | |
| Provide a complete printed copy of the entire project documents. The project folder should contain three sections and section dividers as following:  Section 1: Project Charter, Project Plan and Project Schedule.  Section 2: Software Requirements Specification (SRS), Appendix for SRS and Test Document.  Section 3: Entity Relationship Design and other documents related to the conceptual design. | | |
| Dependencies | | |
| * 2 – Execution * 3 – Controlling | | |
| Time to Complete Estimate | | |
| 4 days | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 4.2.7 | User Manual | Xing |
| Description | | |
| Develop system manual and user manual of the system. The manual should identify the major business uses of the system and walk the user through how to achieve them. | | |
| Dependencies | | |
| * 2 – Execution | | |
| Time to Complete Estimate | | |
| 4 days | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 4.2.7.1 | Complete User Manual | Xing |
| Description | | |
| Develop a user manual of the system. The user manual should include the functions available for the Tiffany Gold Mine Environmental officers. | | |
| Dependencies | | |
| * 2.1 – Execute Design | | |
| Time to Complete Estimate | | |
| 2 days | | |

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| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 4.2.7.2 | Complete System Manual |  |
| Description | | |
| Develop a system manual with details of system requirements, how to install the application/system, how to configure the application/system settings and information that system administrator would required to set up and maintain the product for users. | | |
| Dependencies | | |
| * 2.1 – Execute Design | | |
| Time to Complete Estimate | | |
| 2 days | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 4.2.8 | Demonstration of The Full Working System | Whole team |
| Description | | |
| Demonstrate that the system developed covers all of the requirements of the client. The system is considered the final product ready for the client to use. | | |
| Dependencies | | |
| * 2 – Execution | | |
| Time to Complete Estimate | | |
| 1 day | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 4.2.9 | Demonstration Agenda Sheet | Xing |
| Description | | |
| Prepare the agenda sheets for assessing. The agenda sheets should list the order of functions that will be shown (in the same order as they will be demonstrated). | | |
| Dependencies | | |
| * 3.1 – Have Meetings | | |
| Time to Complete Estimate | | |
| 1 day | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 4.3 | Closing &Evaluating Phase |  |
| Description | | |
| Prepare documentations for the project closing & evaluating phase. The documents include post implementation review and reflective reviews. | | |
| Dependencies | | |
| * 3 – Controlling | | |
| Time to Complete Estimate | | |
| 4 days | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 4.3.1 | Post Implementation Review | Whole team |
| Description | | |
| Review the project in order to learn from what went right and what went wrong. The review should discuss the topics of creating the schedule, tracking time using the schedule, effectiveness, group morale, group productivity, risk assessment, risk management, critical success factors, processes, communications effectiveness, project organization roles and responsibilities and product definition and change control. | | |
| Dependencies | | |
| * 2 – Execution * 3 – Controlling | | |
| Time to Complete Estimate | | |
| 2 days | | |

|  |  |  |
| --- | --- | --- |
| WBS Code | WBS Element | Owner |
| 4.3.2 | Reflective Review | Whole team |
| Description | | |
| The reflective review has two parts. The first part consists of three questions and each of them should be addressed. The answers to each of these questions will demonstrate each team member’s ability to apply what he/she has learned to any project.  The second part is a topic statement that should be answered with a short essay of no more than 1000 words. | | |
| Dependencies | | |
| * 2 – Execution * 3 – Controlling | | |
| Time to Complete Estimate | | |
| 2 days | | |

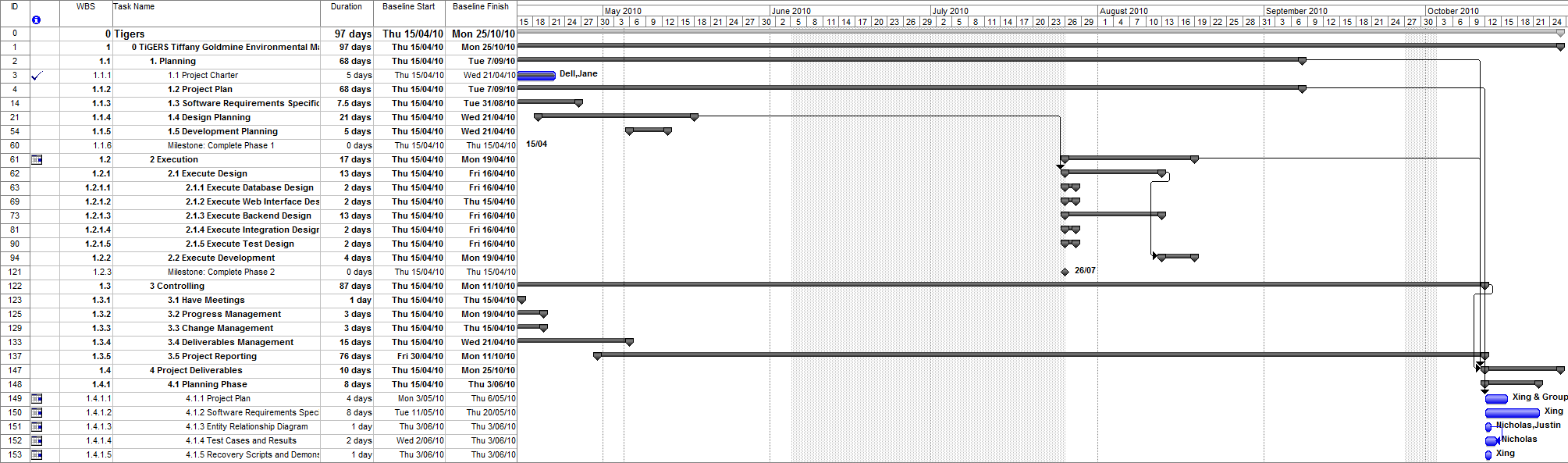
## Assumptions

* The statement of work has been developed basing on the assumption that the development team has six members throughout the whole project life cycle.
* All development facilities required are supplied and any loss of facility will be resolved immediately.

# 

# ****Project Schedule****

## Summary Schedule

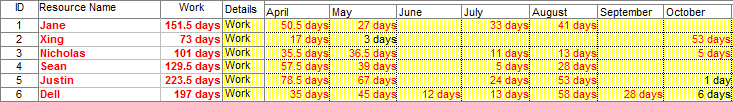


## Detailed Schedule

## Assumptions

* The dependencies have not been finalised as yet so that some of the deliverables are not allocated to their correct project phases.
* The duration of each task has estimated accurately.
* Since the durations and dependencies are only estimates it will be necessary to adjust the schedule.
* The same applies to the allocation of tasks which will need to be adjusted according to the demands of executing the system and practicality.
* The schedule is a volatile document and should give an indication of the progress of the work in constructing the system.
* Task allocation needs to be revised to distribute work more evenly amongst project team members.

## Workload Estimates



# Budget

Not required for this project.

# Appendix I – Document Design Specification

## Font Style

Tahoma is used for all text (headings, normal, titles, etc).

All headings are “Title Case” without periods or exclamation marks.

## Font Colours

Use the built-in “Office” colour style for documents.

## Font Size

Headings are sized automatically based on the built-in “Word 2007” style. This style should be overwritten to enforce 12pt normal text and enumerated headings.

## Text Alignment

All text shall be justified. Exceptions can be made for tables where different alignment within cells increases readability of the table as a whole.

## Line Spacing

Use default spacing from the built-in “Word 2007” style. Do not add extra carriage returns except in the case of positioning embedded objects (pictures, spreadsheets, etc).

## Embedded Objects

Embedded objects should be positioned and resized to enhance readability and impact within the confines of the default page layout. If a section of the document only contains a single object then that section may have a modified layout but this is a last resort.

When multiple objects form a cohesive whole, those objects should be grouped as such. That is, changes in layout or surrounding text should not require logically grouped objects to be stitched back together.

It is preferable that embedded images be vector shapes so that they may be resized and printed without loss of quality.

## Page Breaks

Page breaks should separate major sections (Heading 1). Page breaks within minor sections are only for logically breaking up tables and embedded objects for readability.

When updating a document, be sure that all page breaks still occur in logical places. There should be no blank pages.

## Footers

The footer for every page (except title page) will consist of a left-aligned current document version of the form “Version X.Y” and a centre-aligned page number reference of the form “Page N of M”.