**Work Breakdown Structure for Blood Bank Database Management System - Women In Tech**

Prepared by:

|  |  |
| --- | --- |
| **NAME** | **STUDENT NUMBER** |
| ROJINA SABERI | 217354051 |
| ADINA ASIF | 215691801 |
| KECHINYERE EMEROLE | 216853582 |
| ELSIE BENKO | 217963190 |
| KLARA GOLUBOVIC | 219989573 |
| NOSHIN ISLAM | 216801219 |

**Date:** October 4th, 2022

1. **Project Management**

1.1 Planning and Initiating

1.1.1 Business Plan

1.1.2 Work Breakdown Structure

1.1.3 Define Project Objective

1.1.4 Identify Industry Standards for Project Objectives

1.2 Scope Definition

1.2.1 Prepare Conceptual Schedule

1.2.2 Provide Written Scope Information

1.3 Systems Analysis

1.3.1 System Definition

1.3.2 Requirement Analysis Outline

1.3.3 Component Design Outline

1.3.4 Implementation Process Outline

1.3.5 System Maintenance Outline

**2.0 Define Requirements**

2.1 Define Process for Gathering Requirement

2.1.1 Identify Stakeholders

2.1.2 Stakeholder Register

2.1.3 Define Stakeholder Management Strategy

2.2 Training Program Materials

2.2.1 Create a Guide

2.3 Identifying Risks

2.3.1 Cause and Effect Diagram

2.4 Declare financials

2.4.1 Budget Sheet

2.5 Coordination and Communication

2.5.1 Communications Plan

2.6 Database Plan

2.7.1 Database Design Plan

3.0 **Infrastructure**

* 1. Portfolio Management System (Product-Software)

3.1.1 Solicitation Process

3.1.2 Selection Process

3.1.3 Registration Process

3.1.4 Prioritization Process

* 1. Process Management System

3.2.1 Define the Project Charter

3.2.2 Define Work Plan

3.2.3 Create Status Reports and Product Deliverables

* 1. Organizational Management System

3.3.1 Creating Matrix Structure

* 1. Performance Management System

3.4.1 Interim Dialogues

3.4.2 Executes the Performance Appraisal

4.0 **Website Product Release**

4.1 Website Design

4.1.1 Mock-Up Design

4.1.2 Login Page

4.1.3 Home Page

4.2 Login Data

4.2.1 Login Data for Hospitals

4.2.2 Login Data for Donors

4.3 Website Development

4.3.1 Choice of Framework

4.3.2 User and Backend Interfaces

4.3.3 Database Integration

4.4 Website Testing

4.4.1 Usability Test

4.4.1 Unit Testing

4.4.2 User Acceptance Test

4.4.3 Test Report Generation

4.5 Website Release

5.0 **Software Product Release**

5.1 Software Design Phase

5.1.1 Software Requirement Specification

5.1.2 Prototype Design

5.2 Programming Phase (Software development)

5.2.1 Reviewing Design

5.2.2 Program Coding

5.2.3 Back End Software

5.2.4 Database Collection and Construction

5.2.5 Database Implementation

5.2.6 Graphics and Interface Definition

5.2.7 OS Integration

5.3 Product Testing

5.3.1 Unit Testing

5.3.2 System Integration Testing

5.4 Software release

5.4.1 System Support Documentation

5.4.2 User Support Documentation

6.0 **Integration and Testing**

6.1 Acceptance testing

6.1.1 Acceptance Testing Plan

6.1.2 Acceptance Testing

6.1.3 Test Report

6.2 Technical Training

6.2.1 Training program documents

6.2.2 Schedule Webinar

6.3 Documentation

6.3.1 Release Approvals

6.3.2 Lessons Learned Document

**Work Breakdown Structure Dictionary**

**1.0 Project Management**

|  |  |
| --- | --- |
| **WBS Item Number** | 1.1.1 |
| **WBS Item Name** | Identifying Project Opportunity |
| **Description** All aspects of project opportunity relate to risk especially when it comes to dealing with the three concerns; first being project specification for the expected project deliverables, second aspect deals with all the decisions that go into the business strategy that relate to trade-offs, lastly the beneficial uncertainties may arise during the implementation stage (Kendrick, 2015). | |

|  |  |
| --- | --- |
| **WBS Item Number** | 1.1.2 |
| **WBS Item Name** | Work Breakdown Structure |
| **Description** A deliverable-oriented step-by-step deconstruction of the work to be executed by the project team to complete the objectives and required deliverables of the project (Wrike, 2022). Our blood bank requires three main systems to operate by the end; the software to run the database, the website for the hospitals and donors to access and including testing and approval by our stakeholders | |

|  |  |
| --- | --- |
| **WBS Item Number** | 1.1.3 |
| **WBS Item Name** | Define Project Objective |
| **Description** States the aim of what our Blood Bank Database Management System aims to achieve by delivering the project, which is to provide hospitals with the most efficient tool to access, report and manage a blood donation database that provides real-time information about blood stock levels and donor information. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 1.1.4 |
| **WBS Item Name** | Identify industry standards for project objectives |
| **Description** This pertains to identifying the set of criteria within the industry that the BBDBMS aims to work in which is the medical industry, educational institutions, social organizations and IT sectors. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 1.2.1 |
| **WBS Item Name** | Prepare conceptual schedule |
| **Description** This schedule will outline the earliest phases of the project design. Upon completing the conceptual schedule, a contract will be produced that features the start date, milestones, and completion date. Only upon mutual agreement and a formal change process amongst the stakeholders and team members will allow any change to take place. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 1.2.2 |
| **WBS Item Name** | Provide written scope information |
| **Description** As a pilot project, the BBDBMS aims to work with hospitals in a region-specific to the location of the team members which consists of the entire Greater Toronto Area. However, given the changes this project will bring to these hospitals, it may also entail some risks that need to be considered and planned accordingly. Although our primary end users are hospitals, there may be other end users involved including diagnostic centers or ambulatory surgical centers. Such should be documented in a written scope part of the project appraisal. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 1.3.1 |
| **WBS Item Name** | System definition |
| **Description** A system analysis needs to be conducted for the purpose of studying the parts in order to recognize its project objectives. This would entail a problem-solving methodology that focuses on system improvement and certifies that all the system components work in an efficient manner to accomplish their purpose. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 1.3.2 |
| **WBS Item Name** | Requirement Analysis Outline |
| **Description** Involves defining, analyzing, validating, and aligning stakeholders’ expectations for the project while considering all possible conflicts and constraints that may arise. This should entail and include any development costs that may be procured, setting all the project priorities as well as gaining the approval of all project specialists in the project. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 1.3.3 |
| **WBS Item Name** | Component Design Outline |
| **Description** An approach that evaluates the components and modules of a system once the architectural design phase is complete. Component-level design discusses the different, “data structures, algorithms, interface characteristics, and communication mechanisms allocated to each system component development” (Pathshala, 2020). | |

|  |  |
| --- | --- |
| **WBS Item Number** | 1.3.4 |
| **WBS Item Name** | Implementation Process Outline |
| **Description** Outlines the step-by-step process of the transformation stage of the software technical data package into a well sought out, tested and integrated software configuration items that are finalized for software acceptance testing stage outlined in more detail in step 6 of the WBS (Schmidt, 2013). | |

|  |  |
| --- | --- |
| **WBS Item Number** | 1.3.5 |
| **WBS Item Name** | System Maintenance Outline |
| **Description** A methodological approach to plan and carry out any system issues that may arise. The project team will deploy maintenance focused on the four main areas including, “corrective maintenance, preventive maintenance, condition-based maintenance and predictive maintenance” (Melgaard, 2020). | |

**2.0** **Define Requirements**

|  |  |
| --- | --- |
| **WBS Item Number** | 2.1.1 |
| **WBS Item Name** | Identify Stakeholders |
| **Description:** This process explores and interviews the stakeholders such as the hospitals, donors, and clients and understands their expectations and thoughts. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 2.1.2 |
| **WBS Item Name** | Stakeholder Register |
| **Description:** This document states who the stakeholders are and their effect on the project. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 2.1.3 |
| **WBS Item Name** | Stakeholder Management Strategy |
| **Description:** This strategy outlines the communications between the team members and the stakeholders; to ensure that the stakeholders’ needs are met, planning areas which they are able to participate in, and creating good relationships with them. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 2.2.1 |
| **WBS Item Name** | Create a Guide |
| **Description:** This guide outlines how to use the Blood Bank Database system effectively and easily, so that stakeholders can understand how to appropriately approach and utilize the database. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 2.3.1 |
| **WBS Item Name** | Cause and Effect Diagram |
| **Description:** To identify the risks with the project, a Cause-and-Effect Diagram is used to outline possible risks, and therefore how to avoid them. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 2.4.1 |
| **WBS Item Name** | Budget Sheet |
| **Description:** The budget sheet outlines the income and funding for the project, the expenses for the project, and the amount of savings that the project expects to have. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 2.5.1 |
| **WBS Item Name** | Communications Plan |
| **Description:** The communications plan is the coordination and communication of team members by having scheduled weekly team meetings to discuss the current state of development of the project, and to outline team members’ thoughts and expectations. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 2.6.1 |
| **WBS Item Name** | Database Design Plan |
| **Description:** The database design plan lists the necessary steps needed to take to implement the database to ensure security, and ease of use. | |

**3.0 Infrastructure**

|  |  |
| --- | --- |
| **WBS Item Number** | 3.1.1 |
| **WBS Item Name** | Solicitation Process |
| **Description:** Making sure we are doing the right projects. (Knutson, 2000)  During this step, a business case or project proposal is drafted in order to assist in the future assessment and prioritizing choices. (Knutson,1999) | |

|  |  |
| --- | --- |
| **WBS Item Number** | 3.1.2 |
| **WBS Item Name** | Selection Process |
| **Description:** Process of stopping the wrong projects.(Knutson, 2000)  At this stage, decision-makers from different parts of management will meet to discuss the qualities of the potential initiatives.Each initiative will be evaluated by this committee based on a set of established criteria. They will evaluate the project's worth not just in terms of its economic explanation, but also in terms of its influence on the team, its impact on or cooperation with other initiatives, the company's image in the industry, and more. (Knutson,1999) | |

|  |  |
| --- | --- |
| **WBS Item Number** | 3.1.3 |
| **WBS Item Name** | Prioritization Process |
| **Description:** Making sure we are doing the project parts in the right order. (Knutson, 2000)  The group responsible for making decisions reviews the prioritized list of projects to ensure it makes sense from a business perspective and that no immeasurable factors are missing. (Knutson,1999) | |

|  |  |
| --- | --- |
| **WBS Item Number** | 3.1.4 |
| **WBS Item Name** | Registration Process |
| **Description**  The process of registering a project includes designating a lead person to act as the project's sponsor or champion; compiling a list of all the people involved in the project together with their titles, departments, contact information, and so on. (Knutson,1999) | |

|  |  |
| --- | --- |
| **WBS Item Number** | 3.2.1 |
| **WBS Item Name** | Define the project charter |
| **Description :** Definition phase of Process Management system. (Knutson, 2000)  It records an abstract comprehension of the project's goals and methods. Includes Cost-Benefit Analysis which have estimates about how much it will cost to do the project. Includes purpose statement which is the framework that outlines the project's purpose and how it will be completed. (Truhlar, 2000) | |

|  |  |
| --- | --- |
| **WBS Item Number** | 3.2.2 |
| **WBS Item Name** | Define Work plan |
| **Description:** The project charter is used as a guide during the Planning phase to develop a comprehensive strategy for completing the project. (Knutson, 2000) | |

|  |  |
| --- | --- |
| **WBS Item Number** | 3.2.3 |
| **WBS Item Name** | Create status reports and product deliverables |
| **Description:** Execution/Control phase of the project process. Using the work plan and project charter in order to fill up some forms that help us understand if we made it to the finish line. (Knutson, 2000) | |

|  |  |
| --- | --- |
| **WBS Item Number** | 3.3 |
| **WBS Item Name** | Organizational Management System |
| **Description:** The governance framework that defines roles, duties, authority, and communication links. (Knutson, 2000) | |

|  |  |
| --- | --- |
| **WBS Item Number** | 3.3.1 |
| **WBS Item Name** | Creating Matrix Structure |
| **Description:** A matrix structure organizes a company's vertical and horizontal interconnections. The matrix structure allows the company to save existing activities while yet preparing for growth. (Nasrudin, 2022) | |

|  |  |
| --- | --- |
| **WBS Item Number** | 3.4.1 |
| **WBS Item Name** | Interim dialogues |
| **Description:** Interim conversations between a project manager and their functional manager, including feedback from the project client, take place throughout the appraisal review cycle. Meanwhile, team members are engaging in periodic discussions with their functional supervisors, incorporating feedback from project managers. Discussions at this stage of the project should center on whether or not participants are on track to meet their performance goals and advance the development plan. If they aren't, either the project's aims or methods need to shift, or the project's participants need to realign their focus. (Knutson, 2000) | |

|  |  |
| --- | --- |
| **WBS Item Number** | 3.4.2 |
| **WBS Item Name** | Executes the performance appraisal |
| **Description:** The project's functional manager develops an official review document with client or manager involvement and then does the evaluation. (Knutson, 2000) | |

**4.0 Website for Donors and Hospitals**

|  |  |
| --- | --- |
| **WBS Item Number** | 4.1.1 |
| **WBS Item Name** | Mock-Up Design |
| **Description:** One of the first steps before the development of the website is the draft of a Mock-Up. A Mock-Up shows the overall design by taking attention to the Usability standards. The draft is a rough orientation for the programmers about the design and structure of the website. (Hufford, 2022) | |

|  |  |
| --- | --- |
| **WBS Item Number** | 4.1.2 |
| **WBS Item Name** | Login Page |
| **Description:** At the beginning the Login Page looks the same for hospitals and donors. First, they need to answer the question whether the user is a donor or not. After answering this question, the user is forwarded to their specific login for hospitals or donors. On their specific login page, they have to fill in their login data. For a donor this would be just their donor ID and password. To make the login for hospitals more secure they have to fill in their hospital number, staff number, Code and a password. For both login Pages there will be a 2-factor-authentication. (Government of Canada, 2020) | |

|  |  |
| --- | --- |
| **WBS Item Number** | 4.1.3 |
| **WBS Item Name** | Home Page |
| **Description:** After the login the user is going to be on his or her homepage. The homepage should show general information of the user and give him an overview about the different things the website offers. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 4.2.1 |
| **WBS Item Name** | Login Data for Hospitals |
| **Description:** For the hospitals they have specific staff ID, a hospital number, a code, and a password.  We will use a 2-factor-authentication where the user has to confirm their identity every time they login. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 4.2.2 |
| **WBS Item Name** | Login Data for Donors |
| **Description:** To login in the platform the donor as well as the hospital has their own login data. The donor can login with their donor ID and their password.  We will use a 2-factor-authentication where the user has to confirm their identity every time they login. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 4.3.1 |
| **WBS Item Name** | Choice of Framework |
| **Description:** At this point the development team has to decide which framework is the best for the implementation and the given conditions. Frameworks that might come into question for the website are Vaadin, React or Laravel. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 4.3.2 |
| **WBS Item Name** | Programming User and Backend Interface |
| **Description:** One of the steps during the development and implementation of the website are the User and Backend Interfaces. Therefore, for example Views have to be implemented. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 4.3.3 |
| **WBS Item Name** | Database Integration |
| **Description:** In order for the hospitals to have access to all the information that is required about potential donors the database has to be integrated into the website.It has to be connected to our implementation so that also the information of the donor’s is saved correctly and up to date. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 4.4.1 |
| **WBS Item Name** | Usability Tests |
| **Description:** Usability Test should show whether users of the application know how to use it and whether there might be more efficient ways to structure the website and its design. In order to do that one can make tests with users to see how they deal with the website as potential users. Through those tests we can identify problems and get feedback about our website. (Moran, 2019) | |

|  |  |
| --- | --- |
| **WBS Item Number** | 4.4.2 |
| **WBS Item Name** | Unit Testing |
| **Description:** Unit Testing is important to cover all mistakes and misstatements for the application that might happen. It depends on the Framework whether we would do for example JUnit-Test or PHP-Unit Tests. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 4.4.3 |
| **WBS Item Name** | Test Report Generation |
| **Description:** At the end we would have a test report as a written “summary of testing objects, activities and result” (Kinsbruner, 2020). The report would include the results of the tests to show an overview and evaluation about the version of the website. | |

**5.0** **Software Product Release**

|  |  |
| --- | --- |
| **WBS Item Number** | 5.1.1 |
| **WBS Item Name** | Software Requirement Specification |
| **Description**: The hospitals will need to access the Blood-bank Database Management through a software application. From the proposal document, the team settled on a software application that the hospitals can install. This stage is where the requirements of the software for the Blood Bank Database Management used by hospitals will be assessed as well as the database. The hospitals can use the software in order to access the database unique to their hospital, as well as donor information, scheduling and calendar of events. Only hospitals verified by the team and other authorities such as Health Ontario and Canadian Blood Services can access the software. We may also conduct contextual interviews at hospitals in the Greater Toronto Area (GTA) so that interviewees are within their context which aligns with the project's scope. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 5.1.2 |
| **WBS Item Name** | Prototype-design |
| **Description:** This item is dependent on item 5.1.1. After the requirements have been assessed, the prototype of the software can be created. This phase will contain user interface design components to satisfy the required performance standards, simplicity of use, usability, and user attitude, context of use and business goals in its creation. This task will involve creating the prototype of the actual software where these hospitals can access our online database as well as view and manage their client's information and scheduling. This focuses more on the prototype of the front-end aspect of the BBDM software. They will include the donors' tab, a calendar tab, a database access tab etc. We will have low, medium and high-fidelity prototypes. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 5.2.1 |
| **WBS Item Name** | Reviewing Design |
| **Description:** A design review is held early in the software development process. The team will present the planned software design of the BBDMS at an early time in the software design phase to evaluate the requirements and allow for changes, if necessary, to an audience of stakeholders involved in the project, namely the hospitals, potential clients, Canadian Blood services etc. Our product design and what we have come up with so far. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 5.2.2 |
| **WBS Item Name** | Program Coding |
| **Description:** After all requirements have been identified, this stage is where the coding of the software is created, and the functionalities are programmed according to the requirements. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 5.2.3 |
| **WBS Item Name** | Back-end software |
| **Description:**The server, which gives data upon request, the application, which directs it, and the database, which arranges the data so that hospitals may interact with the software, make up the back-end, also known as the server-side. A Back End developer will access the Blood Bank database using server-side language to retrieve all the details about donors, blood group, age, sex, gender etc. Following processing in an application, the hospitals as end-users receive the database results via Front End language. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 5.2.4 |
| **WBS Item Name** | Database Collection and Construction |
| **Description:** The Donor Database is the area where the most important information about the donors is stored, such as name, contact information, donor ID, and blood type and contains information about relationships between them. It is one of the primary deliverables of the BBDMS. During the information collection phase, all entities found are documented, and this is when all the data required to be entered into the database is acquired. The initial ERD diagram is constructed here. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 5.2.5 |
| **WBS Item Name** | Database Implementation |
| **Description:** The BBDMS will provide a database management system implementation which will entail speedy access to more accurate data by responding to database queries as entailed in the scope of the project in a timely manner. A logical schema will be used to specify how the database should be built. Creating tables and constraints in SQL that adhere to the logical schema. The database is populated here. Primary keys are specified, and table relationships are set up here. (Database Design Basics, n.d.-c) | |

|  |  |
| --- | --- |
| **WBS Item Number** | 5.2.6 |
| **WBS Item Name** | Graphics and Interface Definition |
| **Description:** This process is to make sure that the GUI of the software that was created is able to function appropriately and securely with multiple other systems in the same area. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 5.2.7 |
| **WBS Item Name** | OS integration |
| **Description:** Here is where the process of integrating the numerous subsystems into one complete and  larger system so that the subsystems can cooperate will take place. The project team will see faster information flow rates and lower operational costs as a result of system integration. (Grady, 1994) | |

|  |  |
| --- | --- |
| **WBS Item Number** | 5.3.1 |
| **WBS Item Name** | Unit Testing Plan |
| **Description:** The technique of testing individual pieces of source code to ensure that they function properly is known as unit testing. Unit testing is a means to make sure that an application's capabilities are all operating as intended. When a change in one unit interferes with the operation of another, unit tests alert the developer. During the programming stage, it is important for the programmers to unit test each piece of code to make necessary changes and identify errors in the program being written. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 5.3.2 |
| **WBS Item Name** | System Integration Testing |
| **Description:** System integration will enable the overall testing of the complex system made up of numerous subsystem components or aspects of the program. It is at this stage that the program is tested as a whole. This process follows unit testing in 5.3.1 | |

|  |  |
| --- | --- |
| **WBS Item Number** | 5.4.1 |
| **WBS Item Name** | System support documentation |
| **Description:** This documentation has the role of benefiting the program software engineers and programmers. The information that informs individuals who develop, distribute, and use a product about it is known as software documentation. It consists of technical manuals and online resources including help sections and online manuals. This documentation will serve as a reference point to the project team members about the details of the software. (Lutkevich, 2022a) | |

|  |  |
| --- | --- |
| **WBS Item Number** | 5.4.2 |
| **WBS Item Name** | User Support Documentation |
| **Description:** The purpose of the user manual is to guide customers through the process of utilizing the software. The finished product sent to the hospitals includes the user support documents. This user documentation will come in the form of an online support as an IT solution, but an online user manual and instruction book will be made available. (Knott, 2021) | |

**6.0 Integration and testing**

|  |  |
| --- | --- |
| **WBS Item Number** | 6.1.1 |
| **WBS Item Name** | Acceptance testing plan |
| **Description**  Acceptance testing is planned out into 5 phases: plan, test, record, compare, and result. Through acceptance testing, a company can involve end users in the testing procedure and collect their comments for developers to consider. Through this feedback, we’re able to find faults that it might have overlooked in earlier stages (Gillis, 2021). | |

|  |  |
| --- | --- |
| **WBS Item Number** | 6.1.2 |
| **WBS Item Name** | Acceptance testing |
| **Description**  End users interact with the software to judge its usability after the test is created in accordance with the strategy. As outlined by the business in the requirements, the software should live up to expectations. IT should report and correct any problems that are discovered when the tests provide findings. The test will succeed if the outcomes correspond to the acceptance criteria for each test scenario. However, test cases will fail if they go over an undesirable limit (Gillis, 2021). | |

|  |  |
| --- | --- |
| **WBS Item Number** | 6.1.3 |
| **WBS Item Name** | Testing Report |
| **Description**  A test report is a written overview of all test procedures and the final test outcomes of a testing project. An evaluation of the testing process is provided in the test report. Based on the test results, the stakeholders will assess the tested product’s quality and choose whether to release the final program (Hamilton, 2022). | |

|  |  |
| --- | --- |
| **WBS Item Number** | 6.2.1 |
| **WBS Item Name** | Training Program documents |
| **Description**  The creation and implementation of an efficient learner-centered online training plan are required. By doing so, we'll be able to increase your workforce's technical proficiency and provide them with the necessary online training materials. Building confidence and lowering the intimidation factor of the new system can be accomplished by including simple tasks to test learners' ability to click in the appropriate places or on the appropriate buttons, followed by feedback on why the area of the system they selected is correct or incorrect (Pappas, 2021). | |

|  |  |
| --- | --- |
| **WBS Item Number** | 6.2.2 |
| **WBS Item Name** | Schedule Webinars |
| **Description**  For in-depth orientations or to answer queries from learners, instructor-led courses may be necessary. However, the crucial technical component must be included in efficient software online training. The ability to increase one's knowledge and expertise at any time and from any location is therefore guaranteed. Additionally, it's a good idea to include more hands-on online training exercises, such as software demonstrations, tutorials, and practical situations where staff members may test the program. Webinars will be hosted for employees (Pappas, 2021). | |

|  |  |
| --- | --- |
| **WBS Item Number** | 6.3.1 |
| **WBS Item Name** | Release Approvals |
| **Description**  This stage is to ensure to define and approve final release strategies with the customer and all other stakeholders. This is to guarantee that every release package has a collection of connected assets and service components that are interoperable with one another. Lastly, it is to make sure that everyone who will use the new services in the future is trained and that knowledge is shared with all new members in the future. | |

|  |  |
| --- | --- |
| **WBS Item Number** | 6.3.2 |
| **WBS Item Name** | Lessons Learned Document |
| **Description:** This document is the collection of thoughts and input from the members of the project throughout the life cycle. The goal of recording and putting into practice the lessons learnt is to promote improvement in best practices for upcoming projects. The objective is to build a team that improves on its successes while repeating and learning from its failures (Project Management Lessons learned,2021). | |

***References***

Burek, P. (2008, October 19). *Creating clear project requirements* . Project Management Institute. Retrieved October 2, 2022, from <https://www.pmi.org/learning/library/clear-project-requirements-joint-application-design-6928>

*Database design basics*. (n.d.). Microsoft Support. Retrieved October 4, 2022, from <https://support.microsoft.com/en-us/office/database-design-basics-eb2159cf-1e30-401a-8084-bd4f9c9ca1f5>

Davey, L. (2021, October 12). *How to thoroughly document your project requirements*. Project and Team Management Software. Retrieved October 2, 2022, from <https://www.teamwork.com/blog/project-requirements/>

Get Cyber Safe (2020, February 17). *Why multi-factor authentication is an essential part of cyber security.* Government of Canada. Retrieved October 4, 2022, from <https://www.getcybersafe.gc.ca/en/blogs/why-multi-factor-authentication-essential-part-cyber-security>

Gillis, A. S. (2021, October 4). *What is acceptance testing? definition from searchsoftwarequality*. SearchSoftwareQuality. Retrieved October 4, 2022, from <https://www.techtarget.com/searchsoftwarequality/definition/acceptance-test#:~:text=Acceptance%20testing%20is%20a%20quality,testing%20or%20end%2Duser%20testing>.

Grady, J. O. (1994). System integration (Vol. 5). CRC press.

Hamilton, T. (2022, August 20). *Test summary reports tutorial: Learn with example & template*. Guru99. Retrieved October 4, 2022, from <https://www.guru99.com/how-test-reports-predict-the-success-of-your-testing-project.html>

Hufford. Brendan (2022, May 5)*. What is a Mockup? (+How to Create a Mockup in 2022).* Clique. Retrieved October 4, 2022, from <https://cliquestudios.com/mockups/>

Kendrick, T. (2015). *Project opportunity: risk sink or risk source?* Paper presented at PMI® Global Congress 2015—North America, Orlando, FL. Newtown Square, PA: Project Management Institute.

Kinsbruner, Eran. (2020, August 13)*. Test Reporting: What it is and how to make it work for Continuous Testing*. Perfecto. Retrieved October 4, 2022, from <https://www.perfecto.io/blog/test-reporting>

Knott, R. (2021, December 21). *How to Build the Best User Documentation (New Guide) | Blog | TechSmith*. The TechSmith Blog. https://www.techsmith.com/blog/user-documentation/

Knutson, J. (1999). A portfolio management system. PM Network, 13(6), 21, 23. <https://www.pmi.org/learning/library/portfolio-management-system-3567>

Knutson, J. (2000). Project management infrastructure. PM Network, 14(11), 23–24. <https://www.pmi.org/learning/library/project-management-infrastructure-4647>

Lutkevich, B. (2022b, February 25). *What is Software Documentation? Definition, Types and Examples*. SearchSoftwareQuality; TechTarget. https://www.techtarget.com/searchsoftwarequality/definition/documentation

Melgaard, C. (2020, September 24). *What are the 4 types of maintenance?*. Intextia, <https://www.inextia.com/what-are-the-4-types-of-maintenance/>

Mora, Kate. (2019, December 1)*. Usability Testing 101*. [Nielsen Norman Group](https://www.nngroup.com/). Retrieved October 4, 2022, from <https://www.nngroup.com/articles/usability-testing-101/>

Nasrudin, A. (2022, July 4). *Matrix structure: How it works, advantages, disadvantages*. Penpoin. Retrieved October 4, 2022, from <https://penpoin.com/matrix-structure/>

Pappas, C. (2021, May 12). *7 tips to develop effective software online training*. eLearning Industry. Retrieved October 4, 2022, from <https://elearningindustry.com/tips-develop-software-online-training>

Pathshala, U (2002). *Software Engineering Component Level Design*. A Gateway to All Post Graduate Courses. Retrieved October 2, 2022, from <https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/S000007CS/P001067/M022567/ET/1504860540SE-MOD17-e-TEXT.pdf>

ProjectManager. (2021, January 14). *What Is a Work Breakdown Structure (WBS) In Project Management?* ProjectManager; ProjectManager. <https://www.projectmanager.com/guides/work-breakdown-structure>

*Project Management Lessons learned*. Smartsheet. (2021, May 6). Retrieved October 4, 2022, from <https://www.smartsheet.com/content/lessons-learned#:~:text=A%20lessons%20learned%20document%20is,it%20to%20create%20detailed%20reports>.

Schmidt, R (2013). *Software Implementation*. Science Direct. Retrieved October 2, 2022, from <https://www.sciencedirect.com/topics/computer-science/software-implementation>

Schwalbe, K. (2006). *Information Technology Project Management* (9th ed., p. 223). Cenage Learning.

Sample Skeleton WBS for Software/Hardware System Development

<http://www.hyperthot.com/pm_wbs_sw1.htm>

Truhlar, P. B. (2000). WBS.com(ponents)—building a better WBS for object technology. Paper presented at Project Management Institute Annual Seminars & Symposium, Houston, TX. Newtown Square, PA: Project Management Institute.

<https://www.pmi.org/learning/library/work-breakdown-structure-project-charter-8912>

*What is System Integration? | 4 Types of System Integration - Advantages of Each Method - A Complete Guide*. (2022b, May 1). Folio3 Dynamics Blog. https://dynamics.folio3.com/blog/system-integration/

Wrike (2022) What is work breakdown structure in PM <https://www.wrike.com/project-management-guide/faq/what-is-work-breakdown-structure-in-project-management/>