Campus Walk

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# Initiation Phase

## Scope Definition

The purpose of this project is to develop a plan to design a website for new UNCC graduate students. The scope includes plans for: gathering content, gathering requirements, building the front-end, building the back-end, and conducting the rollout of the website.

During the gathering content phase, the team will meet with stakeholder groups in order to find out which subjects and material they would like us to include on the website pages. Our methods for obtaining this information will include interviewing individual stakeholders and conducting focus groups and surveys. We will also use benchmarking to examine similar web portals in search of useful content ideas. Throughout the project plan, meeting with the stakeholders will be a frequent task so that we can stay connected with their wishes for the end-product and make the necessary adjustments.

Our gathering requirements phase is broken out into five distinct main tasks. We developed this phased based information found in an article the Usability.gov website. The idea is to gather three types of requirements and review the requirements again to ensure that all are facets are captured for a thorough set of requirements.

(<https://www.usability.gov/how-to-and-tools/methods/requirements.html>).

During the front-end build phase the team will ensure that the part of the project that the users will see meets the pre-defined requirements. This includes designing a prototype and choosing the web templates. The back-end build phase will support the front-end. As in the requirements and content phases, the back-end build will involve obtaining stakeholder input. The team will also determine what type of technology to employ and create databases to house the related data.

Finally, during the rollout phase, the team will present the website to stakeholders to obtain feedback. The goal will be to obtain stakeholder acceptance of the product and provide any training needed to maintain the site.

## Assumptions

Our assumptions are that:

* The project team will have access to the UNCC web portal
* The UNCC web portal will continue to be up and running at time of launch and beyond
* The project team will have available webhosting space and that the current portal can support additional traffic
* The required front-end technology will be compatible with the existing web server design
* The project team has permission and the technical pre-requisites to use the webhosting space & UNCC web portal

## Constraints

Our project is constrained by three major factors: time, resources and scope as outlined below.

* Time – we have only five months to produce the completed project
* Resources – our project team consists of four students who are responsible for developing the plan; a variety of stakeholders to assist in all phases of the plan; technical resources to implement the plan such as programmers
* Scope – the project scope is to develop and launch a website containing only information needed by new UNCC graduate students.

# Planning Phase

## Activity Definition

**Activity 1** - **Gather Content**

Dragon Boat team members will gather content for the Campus Walk website from a variety of sources. The content will come in the form of ideas, text, videos, and hyperlinks to sites, etc. Our sources will include: research by project team members as well as the results from our focus groups, surveys, interviews, meetings, and benchmarking.

One task within this activity is to conduct focus groups. We will develop the questions, introductory instructions for the facilitator and secure the basic demographic data for each group. Project members will also determine the groupings and select the appropriate participants. Next, the group will make the arrangements for each group including invitations, location, facilitator selection, dates and times.

A second task for the team is to conduct surveys. The team will create the survey instrument and determine which parties to survey. In order to obtain higher response rates, the team will conduct online and paper-based surveys (mailings/handouts). The survey time frame and distribution locations will be determined by the team.

Another task within the content gathering activity is conducting interviews. As in the focus groups, the project team members will develop the questions and determine exactly who to interview data from the interview and about the individual interviewed will be collected. Possible participant groups for each activity will likely come from the project stakeholders. Stakeholders include UNCC faculty, staff, and current students. Additional stakeholders would be providers/vendors that can provide housing and other services new graduate students might need.

The Dragon Boat Team will conduct benchmarking seeking websites of similar purpose. The goal will be to compare our potential content with theirs to glean new ideas for content and creative architecture. All of the data collected from the tasks in this activity will be analyzed and shared to enhance the front-end & user experience.

Throughout the project life span, the team will meet with stakeholders to assess the appropriateness and breadth of the content gathered. The goal will be to ensure the content matches the needs of the new graduate students. Steps will be taken to set up such verification post project close.

**Activity 2 - Gather Requirements**

The Dragon Boat team will gather the requirements for the Campus Walk website in four different tasks. The first task will focus on the user. To achieve this task, we will need to determine potential users and others who might have used the existing UNCC website. Once the target group has been identified, we will create a round of questions by which to obtain their requirements for a comprehensive website.

Secondly, the team will gather business requirements. This task will focus on analysis of how the university assists new graduate students and general university operations that might add to the new website. More specific areas of analysis will include campus events, housing options, available transportation, grocery stores, and university culture. Outputs of this task will serve as organizational process assets.

Third, the team will collect requirements for implementation of the website. This task will involve defining team roles assessing the skills needed to execute, test, or develop the site. The other tasks are specific to the different aspects of implementation. The development aspect involves gathering the code base, aligning to a technology, designing the database, and streamlining to a web architecture. The testing aspect involves defining use-cases, user based test cases, as well as testing of timelines and resources. The quality aspect will set the performance and integrity criteria, reviewing existing standard operating procedures, and determine what technology is available in-house verses may need to be purchased.

Lastly, the project team will review the requirements with stakeholders to determine if the requirements are comprehensive. This task will lead to finalizing the design and setting up the infrastructure. In addition, we may find the need for additional sponsors or funding if the requirements exceed available resources.

**Activity 3 - Build the front-end**

The first activity in building the front-end is to select a template for the front-end design. Selecting a front-end design template involves the following activities: design a web design prototype based on the requirements, identify reliable web builders who can provide web templates, gather all the web templates that align with the expected prototype, choose a web template and obtain user opinion about the selected web design template.

After choosing a front-end design template, the team should decide which features to be included in the template. This involves activities such as examining the requirements document, determining the page layouts such as font size, type, color theme, type of navigation pane etc., deciding the content to be included, designing a prototype to place the content, features in it and then getting the client approval by showing the designed prototype.

After deciding the features, the team can start coding the front-end part. The steps that go into building a front-end include: preparing a Gantt chart to allocate the task over time, designing the pseudo code by determining the program logic, coding the front-end task in an Integrated Development Environment, reviewing each module in the test environment and then updating the project documents. After coding the front-end part, the team should layer the middle tier in order to integrate the front-end with the back-end database.

Layering the middle tier involves the following activities: First, based on the requirements, choose a software architectural pattern. Second, pseudo code the middle layer by determining the program logic. In similar fashion to the front-end coding, we will need to code the middle layer in an Integrated Development Environment and review each module in the test environment. Again, we would update the appropriate project documents.

**Activity 4 - Build the back-end**

As in the front-end build, the first step in building the back-end design is to analyze the requirements gathered in the gathering requirements activity. The team will arrange end user surveys and brainstorming sessions with the stakeholders in order to create a data model based on the results and required functionalities. This activity will also be conducted in an iterative manner until all the data clean-up is been completed. The results will be communicated to the appropriate team members, stakeholders, and sponsor.

The second step in this activity is determining the technology stack needed for the process. We will find out which software can best accommodate the requirements. We will also contact the vendors on our short list in order to flesh out the contract details. The project team will monitor the entire process as well as define and document the priorities based on team and clients’ interests. The team will check the contract to ensure that there are future enhancement options available for the technology stack.

The third step in the activity is to draw the E-R Diagram and conduct data integration analysis. For that, we have to analyze and prioritize the requirements then document business and user functionalities. Based on this analysis we will create a data model. The model will help us identify any ambiguity and determine the feasibility of the data set. Additionally, the team will find out which features and types of data must be stored then analyze the data and process flow. The E-R Diagram will be drawn based on the various database system elements and their relationship with each type of data set.

The fourth step in this activity is to create a database. This will require designing a table and SQL scripts based on the E-R Diagram. Then, working with the UNCC Information Technology (IT) Department, we can generate a potential data flow, to form a logical view of the database. We will key basic data into the new database tables to review the relationship among the data. When satisfactorily completed, we will merge all the scripts together and create the database. User permissions and access levels will be determined based on client/stakeholder discussions. Lastly, we will run a data security check. This task involves identification of the critical functionalities in the code, prioritization of the data content, and arrangement of a backup update schedule for the database.

Frequent meetings and review sessions with the end user team, UNCC IT and other stakeholders will be critical to the back-end build activity. Such meetings and sessions will aid in the communication of project progress, risks, and changes throughout the life of the project.

**Activity 5 - Conduct Rollout**

After the team has finished developing the front and back-ends of the website, it will be time to conduct the website rollout. The goal of this activity is to first conduct a demonstration of the website for select groups of stakeholders before the site goes live. The demonstration will showcase the website content and features. The sub activities are designed to obtain stakeholder feedback, market the website to the target users, and incorporate a maintenance model for the support team to use once the project has closed.

To conduct a demonstration, we will build a prototype of the entire website. After the prototype has been finalized and feedback obtained, the team will determine which project documents need to be updated. Any approved changes will need to be incorporated into the website. Next, the team will work with UNCC IT to integrate the website with the existing UNCC web portal and verify the feasibility of the website. A thorough validation of the functionality and features must be carried out after which the team can secure backups of the codebases and finalize the website.

The next sub activity is to train the targeted users so that they know how to navigate the website and are aware of the features it has to offer. The targeted users will be invited to workshops and take online tutorials. The tutorials will serve as a mechanism to obtain valuable ongoing feedback once the website is rolled out. Such feedback can be put to use in future iterations of the website.

The third sub activity is to market the website. The goals will be to improve the page rank of the website and ensure that it is discoverable by the popular search engines. We will also advertise via email to the targeted users, posting flyers around campus and nearby establishments and use social media.

The fourth sub activity of the rollout is to build a maintenance model for the support team. The support team will be responsible for maintaining the website after the project closes. The goal is to transfer the project knowledge to the support team so that they can carry out the necessary maintenance activities.

## Sequencing

This section describes the logic of the sequencing (or ordering) of each activity in the project. The whole project is divided into five main activities which include numerous sub tasks and activities. Over the course of the project, these activities are completed in an orderly sequence. A few activities depend on other activities to be completed first while the remaining activities can occur at the same time.

The five main activities in the project are to Gather Content, Gather Requirements, Building the Front-end, Building the Back-end and finally Conducting the Rollout of the web application. In first activity, Gathering Content (WBS 1.1), we will collect the content that will eventually be displayed on the website. The main tasks included in this activity are to Develop Focus Groups, Conduct Surveys, Conduct Interview, Compare Benchmarks and to Meet with stakeholders. Each of these tasks are not dependent upon the other tasks in the Gathering Content Activity. Therefore, these tasks can all be started concurrently. For example, Conducting Surveys and Conducting Interviews can be done concurrently as neither task is dependent on the other to be completed first.

However, when we consider tasks such as Developing Focus Groups which includes subtasks Developing the Questionnaire, Identifying the Groupings and Participants, Creating Logistics for each group, Conducting the Focus Groups and Analyzing the Results of the focus Groups, we can see that all the subtasks need to be followed sequentially. We cannot first determine the Groupings and participants without first determining what questions to ask.

Creating the logistics for each group includes tasks such as determining the when and where to hold the focus groups, sending invitations, recording the acceptances, and securing the facilitators also must be done in order and depend upon one another. Only after we fetch the list of the groupings and participants can we send out the invitations and schedule the focus groups. The Conducting Focus Groups activity is dependent on creating the logistics and analyzing the results of the focus groups is dependent on conducting Focus Groups. We cannot analyze the results before the focus groups are held.

The second main task, conducting surveys, includes subtasks developing survey tool and determining survey methodology. These two subtasks can be done simultaneously followed by conducting the online survey, paper based survey, then analyzing the survey results. Though the online and the paper based surveys can be conducted concurrently, they depend on the first two subtasks to be completed first. The same with analyzing the survey results which first requires the surveys to be conducted.

The third major task is to Conduct Interviews. This includes subtasks such as brainstorming. We must first conduct the brainstorming before we can analyze the results. Creating the logistics for the interviews, inviting the participants and conducting interviews and analyzing the interview results must be done sequentially. Each subsequent subtask depends on the previous subtask. We cannot conduct the interviews without first inviting the participants. Inviting the participants requires us to understand the kind of questions we would ask.

The fourth major task is Benchmarking where we identify and reach out to various organizations, reviewing their architectures, generating statistics and preparing the document for architecture review. These subtasks follow the order in which they are specified and cannot occur in any other sequence. The final main task under Gathering Content is meeting with stakeholders. Meeting with the stakeholders involved in the project can be done in parallel with all the other four main tasks since it does not require those tasks to be completed first.

The second activity in the project is to Gather Requirements (WBS 1.2). This activity does not hinder the Gathering Content phase (the first activity) because the tasks under this activity do not depend on or interfere with the tasks in the first activity. Therefore, these activities can be carried out concurrently. The major tasks involved are to gather user, business, and implementation requirements. It also involves reviewing these requirements, conducting training, and reviewing changes. Gathering the three requirements types can all be done concurrently since these tasks do not depend on the other tasks to be completed first.

Reviewing the requirements can only be done only after the first three tasks have been completed. The final subtask which is to conduct training and review changes can be done only after the completion of the first three tasks and can be done in parallel with reviewing the requirements since it does not depend on that task.

The subtasks under Gathering User Requirements should follow the order listed in the Gantt Chart. We need to first gather the student contact information before we can contact them, and we cannot interview the candidates before finalizing the list of interview candidates. Finally, in order to analyze the interviews, the interviews should have already taken place. The third task is gathering business requirements. The sequence of subtasks is to first define the objectives, survey the client base, analyze the documents, university location analysis and the stakeholder requirements. Before we can do anything in this task, the objectives need to be defined. Only then we can start surveying the client base. However, the university location and document analysis can take place concurrently after the first two subtasks since they do not depend on each other. When the analysis is complete, the stakeholders can be approached with the results to gather their requirements.

The third main task is to gather implementation requirements. The first subtask is to define the team roles after which the requirements for the development process, the testing prices, and the quality process can all take place concurrently since the requirements for each of these processes is not dependent on the other. Only after we gather the requirements for the three processes can decide on the software and license requirements. If we were to first go with the software and license requirements, we would be faced with the question as to which software and hardware is required. Without the other subtasks happening first we cannot determine these requirements. The fourth task is to Review the requirements. This is followed by the task of reviewing the requirements and conduct training.

The Third activity in the project is Building the Front-end (WBS 1.3). This activity is dependent on the gathering of requirements to be complete. It cannot start without first gathering the requirements. The tasks that come under this activity are to select the front-end design template, decide the features to be included, coding the front-end technology, layering the middle tier, implementing prototype modeling, then quality analysis. Before we can decide on which features the website would include, we must first finalize the design layout and template. After that, the front-end can be coded followed by layering the middle tier and implementing the prototype modeling and quality analysis.

For the task of selecting the front-end design, we must first design a prototype, gather the suitable web templates for the design and then share it with the stakeholders. It is important that this sequence is followed since we cannot obtain the user’s opinion without first designing a prototype and gathering the templates for them to review. The same can be said when deciding which features to include. This task further involves subtasks: analyzing the requirement document, determining the page layouts, deciding the content, designing the prototype, and getting the client approval. Before we can determine the page layouts, we need to first analyze the requirement document to understand the functionalities desired. Once we have the layout in place, we need to decide on which pages to place the content. After we are done determining the page layouts and the content to be presented in those pages, we would finally be able to design the prototype and send it for client approval.

The next major task is coding the front-end. The main subtasks involved under this task are to design the pseudo code, code the front-end part, and document the code. These subtasks need to be followed in this specific order since we cannot first start writing the code without first designing the pseudo code and we cannot document the code without first finishing the coding part. Once we are done with building the pseudo code for the front-end application, we can start layering the middle tier and this task can go hand in hand with the coding of the front-end concurrently.

The fourth activity in the project is building the back-end for the application. This activity should begin only after the gathering of content and requirements have been completed. Without the content, the database back-end would have nothing to store. Without gathering requirements, we would not be able to determine what kind of database structure to build. However, building the frontend and the backend can occur concurrently since one does not require the completion of the other to start. At some point in time, the front-end part will be integrated with the backend. Integration must take place after the front and back-ends are complete.

Building of the back-end includes tasks such as analyzing the requirements, determining the technology stack, and building the ER model. After the relational tables are modeled, the database must be populated with data. Then writing SQL queries for various business functions and reviewing the database performance can take place. This sequence should be strictly followed since each of these tasks require the previous task to be completed. It is important to note that conducting risk analysis, which is included in the back-end build section of the Gantt chart is independent and can be done concurrently with the backend tasks.

The final major activity in the project is to conduct rollout. Conducting rollout requires the application to be fully completed. For that to happen, all the major activities (gathering content, gathering requirements, building the front-end and the back-end) should have been completed. The major tasks involved in this activity are to demo the website, train the users, market the website, build maintenance model and perform testing.

Only after the application prototype is created, demonstrated and approved by the stakeholders can we start training the users. The users cannot be trained prior to the demonstration and approval of the stakeholders since any modifications or changes after this stage might necessitate re-training the users -conducting the workshops again for the same set of users and recreating the online tutorials. The same applies to the Marketing of the website. This task can only begin after the approval of the demonstration by the stakeholders. It can happen concurrently with the training of the users since both tasks are not dependent on each other but are together dependent on the approval of the demonstration.

The other major tasks involved in conducting the rollout are to build the maintenance model and perform testing. Both tasks can start immediately after the prototype is approved by the stakeholders. It can also occur concurrently with the other two tasks of training the users and marketing the website.

## Duration Estimating

The purpose of this section outline the estimated amount of time each activity will take too complete. The project must be completed within one semester, five months, including holidays and weekends. Due to the time constraint, we have to strictly monitor the activities at each stage to make sure that the project is completed on time with perfection and quality as promised to the project sponsor. Therefore, significant time has been allotted at the beginning of the schedule to increase the likelihood that the activities placed near the end of the schedule will be successful. Below lie the duration estimates for each activity in our project.

**Activity 1 – Gather Content**

We estimate that the gathering content activity will take 20 days to complete. There are several tasks that can be done concurrently since they are not dependent on each other. For example, the tasks develop focus groups, conduct surveys, interview, benchmarking and arranging meetings with the stakeholders can be done within this timeframe taking 10, 20, 13, five and 20 days respectively.

In the develop focus groups tasks we estimate three days for developing the focus group questions. We allowed one day to determine the participants and participant groupings, three days for completing the logistics of each group, two days for conducting focus groups and another two days for analyzing the result.

Although filling out a survey does not take as long as participating in a focus group, the project team has allowed more time for the conducting surveys to allow time for the surveys to reach the targeted audience. We want to have a high participation rate, so leaving the survey open should increase the chances for significant participation. Developing the survey tool takes two days and determining the survey methodology takes one day and analyzing the result takes four days.

The next step in this activity is to conduct interviews. Again, we have decided to estimate a significant portion of time to prepare for and conduct the interviews. We estimate that it will take seven days. Benchmarking, gathering organization details and setup communication with the organizations should take three days as will the remaining tasks.

The final step in this activity consists of having meetings with student organizations, alumni, prospective students, and nearby establishments. We estimate that these discussions will take five days each. Since most of the tasks are independent, they can be done concurrently to stay on schedule.

**Activity 2 – Gather Requirements**

Gather Requirements should take 35 days of time in total. The tasks therein are an estimated 20, 13 and 20 days respectively, however the actual duration will be only 20 days since they can be done concurrently. Review requirements, conduct training and review changes will be started only after the previous tasks have been completed. We estimate that the review requirements will require four days to obtain stakeholder feedback, five to finalize design, and additional days to secure funding and set up the infrastructure.

Lastly in this section, we will conduct training and review changes which are critical for the project success and quality of our product. Here are the estimated durations of our subtasks: Training which takes 5 days, Budget Development and Analysis which take 2 days, Conduct Discussion at various stages which takes 7 days, Finalize the changes which takes 2 days and Reconsider Stakeholder Groups which takes 2 days. Even in this activity most of the tasks could be done parallel and thereby help us save time.

**Activity 3 – Build the front-end**

Building the front-end is estimated to take 60 days of the schedule. In this Activity the main tasks are to select front-end design template, decide which features to include, coding the front-end technology, layering the middle tier and implementing the prototype which includes modeling and quality analysis. Each section is estimated at 11, 14, 27, 27 and 14 days in duration respectively.

Selecting the front-end design template and designing the prototype will take three days, identifying the reliable web builders takes 2 days, gather all the web templates takes 2 days, choose a web template takes 2 days and Get the user opinion takes 4 days.

In Deciding the features to be included, Analyze the requirement document takes 2 days, Determine the page layouts takes 3 days, Decide the Content takes 2 days, Design the prototype takes 4 days and Get the client approval takes 3 days.

Next step is to code the front-end technology and in that Prepare a Gantt Chart takes 3 days, Design Pseudo code takes 5 days, Coding the front-end takes 10 days, Review the modules takes 5 days and Document each phase takes 4 days. Here no one of the tasks is happening in parallel as they are inter-related.

The subsequent step is to layer the middle tier. And in this phase we have to decide a software architectural pattern and it takes 3 days, create a Pseudo code for the middle layer which takes 6 days, Coding the middle layer takes 11 days, Review the modules which takes 5 days and at the end will Document each phase in 2 days.

Lastly, we will Implement Prototype Modelling and Quality Analysis with extreme caution and in that Review Developer Competency phase takes 3 days, Rapid Prototyping takes 3 days, apply changes to Rapid Prototype model takes 2 days, Follow Six Sigma takes 2 days and Generate Statistical report of each features usability takes 4 days.

**Activity 4 – Build the back-end**

Build the back-end takes 40 days of time and it has the main tasks like Requirement Collection and Analysis, Determine Technology stack, E-R Diagram & Data Integration Analysis, Create Database and Conduct Risk Analysis and Performance Check. And each of these activities takes like 10, 5, 10, 15 and 15 days respectively.

In the Requirement Collection and Analysis phase, End User Survey takes 1 day, Conducting Brainstorming sessions takes 1 day, create a data Model takes 2 days, analyzing these results take 3 days and finally Documentation takes 3 days.

Next step is to Determine the Technology stack. And we have the following 5 steps associated with it and each takes 1 day each to perform. The tasks associated with it are Find out the software needed, find out the software vendor details, Monitor the process, Define and document Priorities and scope for Future Enhancements.

In Subsequent step the E-R Diagram & Data Integration Analysis is been done. The main tasks related to it are Analyze the requirements document, create a basic data set, discuss about Entities and relationship and priorities, Review Model and Data Flow and Model the Diagram. And it takes 2, 1, 2, 2 and 3 days respectively.

Following phase is for creating the database and here the key responsibilities are to Create Tables, Create Data, Analyze the Data Structure, Creating the Database and to do Backup and do security Check. Each phase carries 3, 4, 2, 2 and 4 days individually.

And Finally we will do the Conduct Risk Analysis and Performance Check. Core jobs here in this phase are Hire and orient Backup Developers, Form risk register, build risk breakdown structure, Conduct risk analysis and Review Database Performance. Each of these jobs are critical for the project and hence it should be done with utmost care. And each jobs takes 2, 2, 3, 3 and 5 days respectively.

**Activity 5 – Conduct Rollout**

Conduct Rollout takes 55 days of time and it has the key tasks like Demo the website, Train Users, Marketing the website, Build Maintenance Model and Perform Testing. And for each of these activities it takes like 15, 30, 40, 10 and 20 days respectively.

During Demo the website phase, we have to create the Prototype for website, have to Integrate the Work, Do Validation, Prepare Documentation for the process and do the Implementation. Each phase carries 3, 5, 3, 2 and 2 days individually.

We have to train the users and for that we have to Determine the training goals, assess basic knowledge of end-user, conduct workshops, conduct online tutorials and make the training program scalable. Each of these jobs takes 4, 7, 7, 7 and 5 days respectively.

Following phase is Marketing the website and the major portion of the time in this activity will be spend in this particular activity. The subtasks related to it are: Optimize the content for search engines, increase number of incoming links to the website, promote through social media, follow traditional strategies and Advertise the website. Entire subtasks in this stage could be done parallel and it takes 40 days to complete.

The next step is to build a maintenance model which requires us to set up Meeting schedule, Prepare the team for downtime, arrange support in case of issues, Create Teams based on these criteria’s and Report Issues. And each of these jobs takes 1, 3, 2, 1 and 3 days singly.

Finally, we will arrive at a very critical task of the project -performing testing. The main footstep of testing includes Implement Time Constraint Strategies, Functionality Testing, Compatibility and Performance Testing, analyze the test results and lastly doing Acceptability Testing. Each of these tasks are inter-related and hence it will be done one after the other and it takes 3, 4, 4, 5 and 4 days separately.

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## Scheduling

The Campus walk project plan is to design and rollout a website for new UNCC graduate students within five months (150 days). The project start coincides with the begging of the UNCC fall semester - August 22, 2016. The project must end by January 18, 2017 to be ready for publication before the Spring semester starts.

Among the five main tasks, gathering content and gathering the requirements can take place simultaneously until the analysis begins. Gathering the content takes 20 days and it starts from August 22, 2016 to September 10, 2016. Gathering requirement takes 35 days from August 22, 2016 to September 25, 2016.

The team purposely chose to schedule a significant amount of time for gathering content and requirements because of their importance to the project. It is important to take the time to select the right participants who will give the team the most comprehensive information about web content. It may take the team significant time to secure venues for the interviews and focus groups. The schedule also allows the project team to give the participants advanced notice so that participants block off time on their calendars to attend the events.

Gathering content and requirements were placed at the beginning of the project to give the team time to determine which features are needed long before the frontend and back-end builds begin. The building will certainly rely on the information gathered at this point in the project.

The analysis subtasks of both activities will likely be handled by the same project team members. Therefore, the gathering of content analysis needs to be finished prior to the gathering requirements analysis begins so that both can be completed independently. There is the possibility of waiting to do the gathering content analysis in order to combine the analysis of both. However, that presents a slight risk to delaying other portions of the WBS that rely on the information obtained from the gathering requirements section of the project.

Building the front-end takes 60 days of duration and it is scheduled from September 26, 2016 to November 24, 2016. Deciding the front-end design template and deciding the features are started in parallel and the other three tasks depend on the completion of first two tasks. Building the front-end takes 60 days, which is the longest duration of our Campus Walk WBS. It involves the implementation of both front-end and middle tier technologies.

The first task in building the front-end is to select the front-end design template. 11 full days were allocated for this activity and this task starts from September 26, 2016 and ends on October 6, 2016. This activity is scheduled right after the end of the gathering of the requirements. The team should have all the requirements in place and can start with designing the layout and selecting the template. This part is very crucial for the project since the look and feel of the website is what is most important in a website.

In the next task, the team needs to take a decision on the features to be included in the website collaborating with the stakeholders at all times. This task is scheduled right after the initial sketch is demonstrated from the 28th of September, 2016 to the 11th of October, 2016. Every client would want a feature rich website but many factors like the cost, utility, latency and development time for the website should be considered as well. Hence, this is an important task where the team decides on including the relevant features, finalize the page layouts and determine where the content needs to be placed.

The next task would be to develop the front-end. After the template, design layout and features to be included are finalized the development of the front-end begins. This task is scheduled right after the first two tasks. It starts from October 10, 2016 to November 5, 2016. A total of 27 days is allocated for this task. The building of the front-end involves major tasks like writing the pseudo code, coding the front-end, reviewing each module and documenting the code.

The fourth main task in building the front-end deals with the development of the middle tier. The development of the middle tier can begin right after the pseudo code for the front-end is done. We need not wait until the entire coding of the front-end is done. Hence this task is scheduled right after writing the pseudo code for the front-end. It starts on the 17th of October, 2016 and ends on the 12th of November, 2016 requiring a total of 27 days. This involves tasks that are similar to that of coding the front-end but pertain to the development of the middle tier. Developing the pseudo code, coding the middle layer, reviewing the modules and documenting the code are few of the tasks involved in the development of the middle tier.

One additional task that is scheduled in the project is to Implement Prototype Modeling and Quality analysis. This task is scheduled for 14 days from the 11th of November, 2016 to the 24th of November 2016. After the development of the front-end. A prototype model of the front-end is put together and the statistical report of each feature’s usability is generated. This report is used to make changes to the model. Once all the changes are made. the front-end development task is finalized.

Building back-end takes 40 days and it starts from September 26, 2016 and ends on November 4, 2016. The main five tasks in this stage are Requirements collection and analysis, Determine Technology stack, E-R Diagram & Data Integration Analysis, Create Database and Conduct Risk Analysis and Performance Check. Here all five tasks are dependent of one other.

Requirement collection and analysis of the data is the most crucial part of database designing. As such, it will probably take at nearly two weeks to complete. We need to collect the data and analysis it using various means. We will spend time conducting end user surveys and arranging brainstorming sessions with the clients in order to create a data model. The schedule then calls for us to analyze the results and document the outcome. Scheduling this database design first should lead us smoothly to the technology stack.

In the next step we need to determine the technology stack we are using for our database. It will be determined based on the software availability, feasibility and usability features. It can be done within five days and we can start this process once the analysis session of document gathering is completed. We may be able to save time in this section of the schedule if our analysis is sound.

The succeeding phase is to create the E-R Diagram and Data Integration Analysis. This stage can be started only after the above two stages are totally completed because the output of the prior stages is needed in this phase for further expansion. This section of the schedule will take ten days and more elaborate discussion with the clients and team will be needed before submitting the data model to management for review.

Following stage is the lengthiest phase in this activity at a duration of 15 days. It can be started only after all the previous three tasks have been successfully completed. SQL scripts for creating the tables, data and database will be formed at this level and we will analyze the database structure and take backup before going to the next stage.

Finally, we will conduct risk analysis and performance check. It can be started 15 days prior to the end of the back-end build phase. The risk register will be created and risk breakdown structure will be formed. At the end, a risk analysis is performed. Hiring the backup developers and performance analysis of the database will be implemented during this time.

Conducting rollout takes 55 days and is scheduled from November 25, 2016 to December 9, 2016. This final activity of the Campus Walk project was placed towards the end of the project because it involves the maintenance and marking the website after the website is built. Here, as in the other areas of the project, we are using a waterfall approach. We have specific steps to accomplish the work.

Up to this point in the schedule, the project team will have spent weeks collecting the requirements for the website and determining which content should be included on the website, building the front-end to the users’ specifications, then building a robust back-end that can support the front-end components. All of this work should result in a well developed, comprehensive website.

It is this comprehensive website that the team will present to the sponsor and stakeholders during the demonstration section of the conduct rollout activity. Again, this activity was scheduled at the end of the project so that the team would have enough time to obtain feedback on the website prototype and incorporate that feedback into the product. Here the team will also need to validate the functionality of the website components one last time.

The schedule then calls for training development and rollout. Since the team will have received, hopefully, signoff on the site post demonstration, the team can now begin training the team that will maintain the website and support the users. This is key in the activity because it establishes a method for continuation of the product (website) even after the project closes. Scheduling training towards the end of the project ensures that the training covers all sections of the website and all features.

The project team included a variety of training methods in the schedule to increase the likelihood that stakeholders will use the site and that the support team will be able to address any issues that arise post project. Another benefit of this training is additional feedback. As often happens during training, attendees may discover problems with the website that had not previously been mentioned. They may also think of feature that would enhance the final product.

Scheduling training towards the end of the rollout activity enables the project team to resolve the problems that attendees find. It also gives time for the team to submit the features through the change control board which will determine if the enhancements can be performed prior to the end of the project. It is thought that a sound prototype and training will place the project in a good position for a successful closing.

The marketing portion of the conduct rollout activity is also strategically placed post prototype and training. As a result of the multiple stakeholder meetings the team will have held up to this point in the schedule, the team should have a fair amount of material we can use for marketing purposes. In addition, the training and demonstration feedback as well as the testing, will give us some insight as to how users will get to the site and navigation patterns.

## Risk Management Plan

Below are two lists of risks associated with this project. The first list contains risks that are internal meaning they are part of the project plan. The second list contains risk that are external meaning they are not part of the project plan. We have illustrated the degree of risk for both risk types in a matrix between the likelihood of happening of the risk and Impact to the Project.

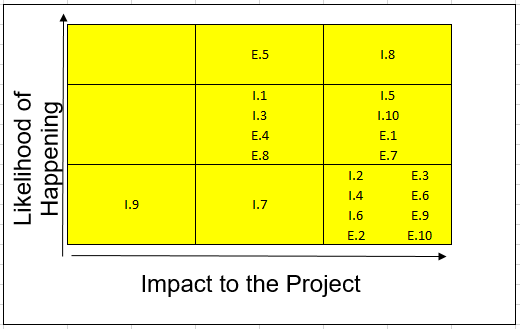
**Internal Risks**

1. Not able to gather proper data from the clients and stakeholders.
2. Stakeholders not agreeing on the terms while signing the statement of work, scope definition and scope validation.
3. Not able to integrate the SQL scripts.
4. Hardware and software used for the project are of poor quality.
5. Not properly understanding WBS and facing schedule conflicts.
6. Failing to identify all critical requirements.
7. Code backup is not done properly.
8. Developers hired are not competent.
9. Front-end web templates should be flexible to support features which are enhanced from the core requirement.
10. The website is not compatible with all versions of different browsers.

**External Risks**

1. Budget not allocated as initially planned.
2. University web hosting space and future scalability not available as promised and web portal not consistently up and running as expected.
3. University deciding to scrap the project entirely.
4. The technology stack used isn't compatible with the university's web server.
5. Project sponsors decide to change the functionality.
6. College software repository corrupts the software and the backup.
7. Project development time reduced from 5 months to 3 months.
8. Stakeholders not participating as much as required.
9. Permissions not granted by various departments in the campus.
10. The web host server should withstand all sort of attacks such as viruses, hacking etc.

**RISK MATRIX**



I = Internal Risks.

E = External Risks.

**Risk Strategies**

Below are the strategies for reducing the top five risks to our project.

**Risk 1: Not properly understanding WBS and facing schedule conflicts**

This is an Internal Risk category and the likelihood of happening is Medium and potential impact on the project is really high. Failure in identifying and understanding the WBS workflow will have a major impact on the project and it affect the entire project success.

Category: Internal

Strategy: Mitigate

This risk could be mitigated by understanding the skill set of the team and giving them proper trainings and conducting workshops regarding the project and its milestone. By having proper knowledge about the project and the WBS gives them an upper edge and thereby they will understand the dependencies if any and could avoid the schedule conflicts in a better fashion.

**Risk 2: Developers hired are not competent**

This is an Internal Risk category and the likelihood of happening and potential impact on the project is really high. So this risk factor should be taken into consideration well in advance so that it could be handled in a better way without making a major impact on the project.

Category: Internal

Strategy: Accept and Mitigate

It is a known fact that a projects success depends on how well the resources are. This risk could be handled by having a close relation between the project manager and the Human Resource Management team so that they could be updated regarding the chances of needing a new resource and also they will have updated regarding the technical/diplomatic issues and special requirements if any. In that way we could buffer resources in advance and they could cover up the project activities in other developer’s physical /technical absence.

**Risk 3: The website is not compatible with all versions of different browsers**

This is an internal risk in which the website design is not compatible with all versions of different browsers. The users don't use the website, if the website contents are not compatible with their browsers. The potential impact to the project is high. Since, if the website contents are not compatible with cross browsers, then the website lose its major purpose of serving information to the graduate students. Also, Likelihood of occurring this type of risk is medium since, the developers has solutions to fix the website compatibility issues.

Category: Internal

Strategy: Mitigate

The strategy to fix web compatibility risk is by mitigating the risk through intermediate steps. We can reduce its impact or likelihood by taking intermediate steps such as training the developers/ designers with modern technologies such as ajax enhancement, outdated browser detection technique, compatible web-design tags etc., or by arranging the knowledge transfer session among the developers to address the common web compatibility issues. These intermediate step makes the Developers/ Designers to troubleshoot the website compatibility issues. We can mitigate against the impact or likelihood of it happening but still we have to do some intermediate tasks like training the developers or discussing within the team. Therefore, by following these intermediate task, we can reduce/ mitigate the chance of that the risk happens.

**Risk 4: Budget not allocated as initially planned.**

Category: External

Strategy: Avoidance & Mitigation

Team Dragon Boat can mitigate budget constraints by including two or three alternative plans at different price points into the project. First the team must consult with the project sponsor to determine potential budget shortages and where they will impact the project. The team will use that information to develop cheaper plans for each major point of impact. The team will have to ensure that the alternative plans are still within scope and gain approval/acceptance from the sponsor and stakeholder for any plans that are out of scope. The team should also conduct a reserve analysis to develop contingency reserves which will help mitigate cost uncertainty.

A potential budget impact point is paying for web developers. If the team does not have the proper budget to hire the necessary web developers, certain attributes of the website might have to be sacrificed in order for the project to continue. Another potential budget impact point is space on the existing UNCC site and server. If the University decides to charge the project team for such space, the team will have to shift other resources to cover that expense.

**Risk 5: Project development time reduced from five months to three months**

Category: External

Strategy: Mitigation

Team Dragon Boat has estimated that five months are needed for project development. However, it is possible that the University will require project completion within three months -the length of a full summer semester. The impact of reducing the time for the project would be high because it could also reduce the amount of time we have to carry out our tasks which might lead to an increase in errors or defects in the deliverables.

Should the project time be reduced by two months, Team Dragon Boat may have to reduce or even eliminate certain aspects of the project. As with budget constraints, the team will need to consider alternatives to project components affected by time constraints. The team will use the WBS to calculate the critical path, critical chain, and areas of slack. This will help the team determine if schedule compression (crashing to add extra resources or fast-tracking doing certain activities at the same time) is needed and exactly where to use those compression methods.

## Project Plan (1 page plus appendix)

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# Executing Phase

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## Quality Plan

This section describes the five leverage points that Team Dragon Boat believes are most important to perform at the highest quality possible. If these tasks are not of high quality, the success of the entire project will be in jeopardy.

In addition to the leverage points, we have qualitatively and quantitatively defined the metrics and described the tasks that we hope will close any gaps in the project.

**Leverage Points:**

The following are the five leverage points of importance in maintaining the quality of this project.

1) Gathering the right content

2) Gathering the requirements from all stakeholders

3) Finding the usability of Campus Walk website among users

4) Analyze the structure of backend database

5) Prototype demonstrative meeting all approved user requirements

**Leverage Point 1:**

Team Dragon Boat must ensure that we **gather the right content** to post on the website. The content must cover the topics most relevant to future website users. We would consider this leverage point of high quality if the stakeholders are satisfied with the depth and breadth of the content gathered.

We will measure level of satisfaction qualitatively during monthly meetings with our stakeholder groups. Project members will ask stakeholders to review content as gathered and provide feedback. The feedback will be used to modify the content appropriately. Any feedback that would result in a change in scope will go through the project’s formal change request process.

We define this point quantitatively as 90% or higher stakeholder positive responses to survey questions posed. This metric can be calculated by conducting a brief survey of the stakeholders. The survey instrument would contain questions about specific content using a five-point Likert scale. The survey would measure satisfaction after changes have been made.

The analysis of the information will be used to determine what is needed to close the gap between the target (what we want the leverage point to look like) versus actual performance. Tasks to close the gap may include adding more future users to the stakeholder group in order to ensure the team has considered relevant topics.

**Leverage Point 2:**

The second leverage point Team Dragon Boat will review in depth is the **Gathering of requirements.** Requirement gathering is an essential part of project management. Executing the wrong requirements can have a very high negative impact on the later stages of the project resulting in higher costs and more time to make corrections. It is necessary to ensure that the right requirements have been collected at the beginning of the project and with utmost quality. This phase includes collecting inputs from all the stakeholders and sponsors involved in the project.

The qualitative metrics are that: the right people are approached with the right questions, the survey and interview questions asked are appropriate and the answers received help us figure out the requirements. For quantitative metrics, a signoff from 90% of all stakeholders on the requirements document is required.

To ensure quality in the requirements phase, we will prepare a sketch to integrate the requirements. After the sketch, we will present the prototype to the stakeholders explaining the features and showing them that their requirements have been addressed. If the stakeholders are satisfied, they are required to sign off the requirements document. If the stakeholders believe some of the requirements have not been covered, the team will work with the stakeholders on those areas.

As new requirements are identified during the project, they will go through the formal change request process.

**Leverage Point 3:**

The Third leverage point is to understand how usable the website is for the students. The quality of the website design can be improved by making the website as simple, user-friendly for the students. If the features of the website are too complex, then there is zero usability of the website among students. This could result in fewer users over time.

Team Dragon Boat will employ tools such as Crazy Egg and Qualaroo to qualitatively illustrate the user’s online behavior such as which hyperlinks they are using and where they stop reading. These tools provide statistical usability reports by feature. For example: which page view feature was clicked 1000 times over last two days but the search feature was just clicked 50 times over the same period of time. This statistical report provides an opportunity to improve the usability of features, which ultimately improves the quality of the website.

We can close the gap between the users and the website usability by following a six sigma conversion table. Each sigma takes time to gather data such as collecting user’s feedback. During first sigma or phase, the data gathering will tell us more about defective features. During second sigma, the data gathering among the users later in the project. During the last sigma, the negative feedback collected among the users in those last few weeks should not more than 3.4. In each sigma, the negative feedback data is gathered, discussed and if approved, given to the developers to enhance the usability of the website. In each sigma, the amount of negative feedback should decrease.

**Leverage Point 4:**

The fourth leverage point is to **analyze the structure of the back-end database**. This task determines the extent to which all the end user functionalities have been implemented by the team. A bad database structure could disrupt the overall flow of the project and suspend subsequent phases of the project. A good database structure will enhance the performance of the product.

A qualitative review of structure performance involves determining of the required functionalities suitable for the application. A standard format is using a check list check the performance of the database. Once the review of the structure is complete the changes go through the change review process.

For quantitative analysis of this leverage point, we can again conduct a review and analysis of the structure more critically. The structure will be cross verified with the help of database designers and senior management team. If any discrepancies or dependencies exist, they would be addressed. We will accept the structure for further stages of the project only if the results give more than a 95% positive response at all stages.

Finally, we will give regular demonstrations to the stakeholders to obtain feedback used to improve the quality of our project. Any errors detected at this stage will be analyzed in-depth and documented with the solution for future references. A requirements analysis cross-validation test also needs to be done at this level to increase efficiency and feasibility of the application.

**Leverage Point 5:**

The last leverage point for the Campus Walk Project is the **successful testing of the application prototype.** The Business team, comprised of the stakeholders and sponsors, participate in the acceptance testing.Acceptance testing evaluates the website’s compliance with the business agreed upon requirements and assess whether the product is acceptable or not. The stakeholders are expected to review the prototype of the application and screen it for any visual defects. They are to provide a feedback on the application.

The qualitative expectation would be that most of the stakeholders would be happy with the application prototype. The stakeholders would find zero or very few bugs during their testing. In addition, a majority of stakeholders would be satisfied with the performance, accessibility and user-friendliness of the application. The stakeholders will find the application very intuitive to use and that their requirements are met.

We define this point quantitatively based on feedback and survey responses. The cumulative result should 90% or higher satisfaction rate in the functional test results. A review of defects should result in no more than a 5% bug detection rate. Also 90% or more of the requirements are to be satisfied by the application before they can be submitted for formal acceptance.

Monitoring the quality of the project throughout the life of the project should increase the likelihood of a successful project and product. Our quality management plan is designed to make certain that we are gathering the right requirements, testing the usability of the website, reviewing the structure of the backend database, and that we have a successful prototype demonstration.

# Controlling Phase

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## Change Control Plan

Team Dragon Boat selected five milestones/deliverables that will serve as signs that the project is still on the right course. At each point, the team will obtain approval from the appropriate stakeholders prior to moving to the next task.

1 & 2 -Two Written Reports (deliverables)

At the end of the gathering content phase, the team will gather the data collected, analyze it, and write a report explaining the results of the analysis. Included in the report will be recommendations for the type of content that should be included in the final product.

This report will be presented to the stakeholders and the project sponsor from whom feedback will be expected. At that time, stakeholders and project sponsor will decide which recommendations they wish to accept. Once acceptance is granted, the project documents (e.g. change log, risk register, etc.) will be updated. The project team will then continue on to the next task.

The end of the gathering requirements phase will result in collection of the data, analysis of the data, and a written report. As in the gathering content phase, stakeholders and the project sponsor will review the report to determine if all the requirements were captured properly. If any requirements are missing, additional discussion among the stakeholder, team, and sponsor will be necessary to ensure everyone has the same understanding of each requirement.

Once approval is granted, the team will again update the related project documents. It may be necessary to update the WBS to ensure the tasks will result in completion of any additional requirements.

3 -Template Selection (milestone)

One of the tasks during our build front-end phase is to select the web templates. Completion of this task will be a crucial milestone in our project. The template will determine how well the users can navigate the website, their ability to locate information, as well as properly showcasing the content. The subtasks in this phase include obtaining stakeholder input.

Input and buy-in will need to be obtained prior to moving forward. Buy-in will be obtained through stakeholder and sponsor meetings then putting changes through the change control board process. When the buy-in is obtained, the project documents will be updated to reflect the changes.

4 -Prototype demo (deliverable)

In addition to selecting the web templates, designing the prototype is another milestone during the front-end phase. As with the previous milestones and deliverables, demonstration of the prototype is a deliverable that will need to receive stakeholder/sponsor approval before the project work can continue.

5 -Acceptability Testing (milestone)

Our rollout phase includes several tasks devoted to testing the product. Testing is necessary to ensure that all our efforts up to that date lead to the rollout of a useful website. During testing, the team will learn if all of the features are working and if the agreed upon requirements are still included in the product. Select groups of stakeholders will have the opportunity to use the website before it is available to the full user population. The feedback provided by the stakeholders will be used to improve the product and solidify the likelihood that the final product will be accepted.

# Closing Phase

## Project Summary and Lessons Learned

Team Dragon Boat has designed this project plan to develop a website new UNCC graduate students can use prior to and during their first semester at the university. The team will gather content and requirements for the website from the various stakeholders involved in the project. Then the team will build the front-end and back-end simultaneously. Building of the front-end involves developing the design and development of the website while the building of the back-end deals with the storing of the content in a database in an organized and efficient manner. The final stage of the project is to conduct the rollout where in the website is demonstrated, tested and marketed. This stage also involves the building of a maintenance model.

Over the course of the project, the team had to deal with various challenges. We attempted to minimize the negatives and maximize the positives. The team took a largely democratic approach in emotional intelligence terms wherein the inputs and commitments were obtained from all team members. All ideas from the team were brainstormed and final decisions made only after careful assessment and agreement.

We employed a coaching style when it came to editing each section before submitting it for professorial review. The work was divided based on the person's area of expertise which allowed each person to complete their assignment relatively quickly. When we were short on time, the team used a pacesetting style to ensure completion in a timely manner. Issuing reminders of the deadlines, responsibilities, and continuous monitoring of the progress were common for the team.

Lessons learned: We could have used the Agile methodology instead of the traditional waterfall model to accommodate frequent changes that occur when building a website. A better document collaboration software other than Google drive might have allowed for faster editing. Seeking clarification from the professor at the beginning of each assignment and carving out more time to complete each assignment would have reduce the amount of last minute work and changes. Overall, this course assignment taught us a great deal about project management and its usefulness.

# Appendix

## Appendix 1 (1) Work Breakdown Structure (WBS)

The WBS for our project is attached. The level one activities are: gathering content, gathering requirements, building the front-end, building the back-end, and conducting the rollout of the website.