Requirements Specification

for

IT One

Prepared by Group *AE3*

Nicholas Young, Alan Aphayarath, Harry Zhan, Liam Albright

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1. Executive Summary

University of Washington faculty and advisors need data to plan future events and actions for the university. To obtain their data they utilize three different portals: Business Intelligence (BI) Portal, Knowledge Navigator, and UW Profiles, all hosted by UW-IT. However, this implementation has several issues such as confusion, disjunction, and disorganization. We have developed a solution that will consolidate all three portals into one unified portal, ridding of the disjunction, and improving efficiency and usability.

2. Introduction

2.1 Purpose

The purpose of the system is to improve the usability and efficiency of UW-IT's three tools, BI Portal, Knowledge Navigator, and UW profiles, by combining the portals into one. It will aim to improve the usability of the current system rather than completely replacing it. In other words, we will not be introducing new data and will be targeting the same types of users.

2.2 Scope

The new solution will aim to help faculty across the UW campus by making their jobs easier and more effective. This will in turn help students and improve their experience on campus. However, these tools will not be accessible to the public. To access them at all, one must have a valid current UW ID, as it is with the current system. We do not aim to expand the types of users that will use the solution, only increasing the number of users within the UW population. We are also not attempting to create a whole new system from the ground up, only trying to improve upon the current, inefficient system. This means that we will not be introducing new data ourselves, only improving the experience of the current users and future users of the same type. Additionally, the main focus is on the consolidation of the web platform, mobile functionality and other metrics such as performance following.

2.3 Assumptions and Dependencies

There are several assumptions that we made when developing this solution. One is that we assumed people will still have reasonable access to the site. Meaning our users will still have their UW IDs, and UW will not suddenly change the way their login protocols work since we will be depending on their login screen to grant access to users. We also assume that UW-IT will continue existing in order to maintain our solution after deployment, and not disappear and abandon the tool. We also assume UW faculty will continue to use our tool so that we are not wasting money to keep servers online. In addition to those things we are assuming that the databases used for the current systems won't change, because our queries will rely on those. One of our dependencies is knowledge navigator, our new system will be based on the current knowledge navigator algorithms to perform the searches. At the core, we will be using knowledge navigator's search algorithms but will make improvements to the algorithms to

perform better with searches that are in the form of questions or phrases. With this dependency, we are also assuming that our users are familiar with search engines such as google or bing. On the backend, we are assuming SQL services still exist and to that point, we are assuming we don't see exponential growth in database size needs. Additionally, we assume that tableau will continue to exist as a company and offer its services at a reasonable price.

2.4 Current State

The current system involves three different and separate portals: Business Intelligence (BI) Portal, Knowledge Navigator, and UW Profiles. They are located at three different websites with different databases, thus creating confusion, disjunction, and disorganization. Based on a stakeholder panel held during lecture and online research we identified several issues with the current state: users are unaware of how to utilize each portal to its fullest potential, the inability to scale in the future, inefficiency, and frustrating difficult-to-access data. Stakeholders include UW-IT staff and UW advisors.

- Existing Process
    - If a user needs to access data using the three portals, they must log onto each one separately
    - Users frequently need to ask UW-IT to generate their reports
    - If a user wants a definition they can only use Knowledge Navigator
- Current Issues
    - Users must know how to use each portal, which requires different knowledge
    - Many people are unaware that the tools exist, and users don’t know how to maximize the tools’ potential
    - Separate servers are required to upkeep the portals, resulting in excess cost
    - Low scalability for future improvements
    - Limited/niche use cases for each portal
    - Some of the different portals serve the same goal which is inefficient
    - Many cases where data is locked or inaccessible to users
    - Disjunction among three portals creates confusion
    - Difficult for users to make suggestions to improve the systems
    - Hard for users to insert/add or request new data

3. System Description

3.1 System Overview

By creating one unified portal, instead of keeping three separate ones, there will be more organization, unity, and efficiency. In the past, there has been disorganization and a lack of knowledge on how to use all three portals, and even a lack of knowledge that the three tools even exist. We are also not attempting to create a whole new system from the ground up, only trying to improve upon the current, inefficient system.

3.2 Key Users

Currently, users such as the advisors use the system with goals such as answering the questions of students. With our new solution, that will be done more quickly, more accurately, and more easily. In the long run, students will get answers to their questions quicker and, hopefully, have more success in their academic and career endeavors.

We also have users on admission teams that want to predict student success. Our new solution will make this easier for them as well because the new user experience will reduce how much searching around users do before finding the right tool. By reducing the time it takes for users to find the right tool, admission teams can quickly determine if a student would be a good fit for the department.

We also have users such as Financial analysts who will frequently use certain tools to determine where to allocate funds. Using our solution they will be able to save time by either going through favorites or recent tools to quickly use the tool they need to use. As a result, funds will be spent better and more efficiently, leading to lower costs over time.

3.3 Design and Implementation Constraints

Developers will be limited by monetary and hardware costs, such as being limited to what web services they can use and not introducing/deploying new servers. They will be limited to existing databases, and need to develop their code around the structure of the databases.

Developers will also need to stay within the University of Washington design scheme, maintaining consistency with all other UW websites. While fulfilling this rule, they must also develop with accessibility in mind, accounting for people with disabilities such as color blindness and deafness.

In today's technological world, users' privacy is a major concern when developing both software and hardware. Thus, privacy will also be a major concern in our new system. The new consolidated portal will never gather user data without their permission, and if it needs user information/data, it will always provide an option to opt out or decline.

They will also not be allowed to add data, only using the existing data available in the outgoing system. This will keep the system within the planned scope, which is only improving the functionality of the outgoing system, rather than introducing something completely brand new.

4. User Interfaces

The user interface of the name system will have several key features. The first is the overarching design language of our interface is inspired by the Microsoft operating systems Metro design language. This design language was chosen as inspiration because the big block structure of the bottoms is easy for a user to see, click on, and navigate with. Combine that button structure with the UW design scheme and color blind friendly designs are system should

be easier than the current one for all people to use. This is backed up by the research we did that says “a data portal should be structured to users experience level does not limit their ability to use the cite, and as such a portal should only require few clicks for users to get to their data” (Murphy 2016). Which illuminates that the design for a portal is paramount for users ability to use a site. The next key feature is the floating action help button. This is to make it easy for users to find guides and tutorials on how to use the new system. This is key as the system must be useable by peoples of all technical levels.

5. System Adoption

With the new system, we will improve user knowledge on the portal by having user-targeted tutorials throughout the system. We will also make it easier for advisors because they will be able to type a question in and relevant tools to answer their questions will be displayed. This will make the site easier to navigate and familiar to users. By adding a dashboard, users on the site will have a more organized experience and as they become more familiar, site usage should increase. A new feature to help the adoption of the system will be adding an education portion to the site. Upon first using the new portal, we will include an interactive tutorial of how to use the site, which will be tailored towards the user's classification. Therefore, there will be a focus on teaching the users which tools they will mostly use while giving a brief overview of extra tools they are welcome to explore. This should increase user retention and the chance of successful adoption.

In order to measure the success of the new system, we will be measuring user interaction with the opt-out privacy policy. This will entail recording how often people use our solution during a given time period, such as a day, week, or month. We will also record how long a user spends within one usage (bounce rate). We can also perform surveys amongst users to measure satisfaction or implement a simple rating tool, which could be a one to five stars scale or “like” or “dislike” scale, that users can use after using the unified portal. To measure increased efficiency in terms of costs, this will be measured by monetary costs for maintenance, including faculty and server costs. To measure time efficiency for maintenance, we will measure how quick staff members are able to solve user issues and technical issues with the portal. We can determine that our system has improved the user experience by recording how frequently and how long advisors spend on the system.

6. System Requirements

6.1 Functional Requirements

6.1.1 Functional Requirement 1

If the advisor needs to help a student and searches for demographic information using the portal, the system shall return a report about student demographics containing graphics or charts

6.1.2 Functional Requirement 2

If the advisor uses a tool and leaves the tool the system shall automatically add the tool to the recently used section of the user dashboard.

6.1.3 Functional Requirement 3

If the financial analyst has no results for their search the system shall display a result page informing them that there are no results for their search.

6.1.4 Functional Requirement 4

If the financial analyst is planning a change in student tuition that needs information about student budgeting, the system shall return a report about current budgeting at the University.

6.1.5 Functional Requirement 5

If the advisor has a question about the acceptance rate from a prospective student, the system shall provide the corresponding data after his/her searching, selecting, and filtering.

6.1.6 Functional Requirement 6

If UW-IT takes the system down for maintenance, the system shall notify all users through email that the system will be down temporarily, and have a message on the site informing users the site is currently under maintenance.

6.1.7 Functional Requirement 7

If the administrator intends to begin using the portal without previous experience, the system shall give him/her a comprehensive step-by-step tutorial when he/she first login his/her UW netID.

6.1.8 Functional Requirement 8

If the user clicks on the floating button at the bottom right of the screen the system shall bring them to the tutorial page.

6.1.9 Functional Requirement 9

If the user clicks on the report button in the navigation bar at the top of the web page the system shall send them to the result page containing only reports

6.1.10 Functional Requirement 10

If the user clicks the favorite button on the report page the system shall add the report to their favorites.

6.1.11 Functional Requirement 11

If the user adds notes on the tutorial page the system shall add the notes into a database for them to reference in the future.

6.2 Use Cases

Use Case #1

Title: Obtaining a report
Description: How a user would look for a report
Triggers: User searches for data and clicks on a result
Primary Actors: Advisors, Financial Analyst
Level: Blue
Stakeholders: Students, Advisors, Financial Analyst
Preconditions: User is able to authenticate and has permissions to reports
Minimal Guarantee: Portal tells the user the data does not exist and gives the user a report request form
Success Guarantees: Portal returns a report and allows the user to download or print a copy if wanted
Flow of events 1. User logs onto the portal 2. User types into the search bar 3. User clicks the search button 4. User is taken to a page with relevant results 5. User selects the result that best suits their needs and is marked as a report 6. User is taken to a report page with the information they want
Extensions 3. Nothing is in the search bar 3.a.1. A popup instructs the user to try again after typing something into the search bar 4. The search has no results 4.a.1. The result page clearly indicates that there are no results for what they searched.

Use Case #2

Title: Adding a new term
Primary Actors: Advisors, faculty
Level: Blue
Stakeholders: Other students and advisors who do not know the term
Preconditions: User has access to portal and has the ability to add to it
Minimal Guarantee: Term already exists, portal refers the user to existing term and allows them to submit feedback on the existing definition

Success Guarantees: Term is added to the Knowledge Navigator Database
Trigger: User selects button to define term
Relationships: Not interacting with other use cases at this time
Flow of events 1. User logs onto portal 2. User selects the button to define a term 3. When the user inputs the term the system either says the term exists and allows the user to modify the term, or the system tells the user the term does not exist and prompts user to add term 4. User inputs information about term 5. Portal stores term in DB

Use Case #3

Title: Favorite a tool
Description: How a user would add a tool to their favorites
Triggers: User clicks the favorite button
Primary Actors: Advisors, Financial Analyst
Level: Blue
Stakeholders: Students, Advisors, Financial Analyst
Preconditions: User is on the page of the tool they want to favorite
Minimal Guarantee: The favorite star icon is not filled and a message appears informing the user that the favorite could not be added.
Success Guarantees: The favorite star icon is filled and a message appears informing the user that the favorite was added.
Flow of events 1. User is on a tool page 2. User clicks the favorite button with a yellow outline of a star 3. The favorite button changes to have a filled yellow star
Extensions 3. There is no internet connection 3.a.1. A popup notifies the user that the system failed to add the tool to their favorites.

Use Case #4

Title: Find only reports
Description: How a user would find only reports, no definition tools.
Triggers: User clicks the report button
Primary Actors: Advisors, Financial Analyst
Level: Blue
Stakeholders: Advisors, Financial Analyst
Preconditions: User is logged into the portal and has access to some reports.
Minimal Guarantee: They are taken to the result page with no results and a message appears saying an error has occurred or that they don't have permissions to reports.
Success Guarantees: They are taken to the result page where they are welcomed to a list of reports to filter and access.
Flow of events

1. User is logged into the portal 2. User clicks the reports button within the navigation bar 3. The user is taken to a results page that only contains reports
Extensions 3. User doesn't have access to reports 3.a.1. A popup notifies the user that they don't have sufficient privileges to access reports

Use Case #5

Title: Find only definitions
Description: How a user would find only definitions, no report tools.
Triggers: User clicks the definitions button
Primary Actors: Advisors, Financial Analyst
Level: Blue
Stakeholders: Advisors, Financial Analyst
Preconditions: User is logged into the portal and has access to some definitions.
Minimal Guarantee: They are taken to a result page with no definition tools and a message appears saying they don't have access to any definitions or that an error has occurred.
Success Guarantees: They are taken to a result page that is populated with definition tools that can be filtered and accessed.
Flow of events 1. User is logged into the portal 2. User clicks the definitions button within the navigation bar 3. The user is taken to a results page that only contains definitions
Extensions 3. User doesn't have access to reports 3.a.1. A popup notifies the user that they don't have sufficient privileges to access definitions

Use Case #6

Title: Find only tools that revolve around student data
Description: How a user would find tools that are related to student data
Triggers: User clicks the students button
Primary Actors: Advisors, Financial Analyst
Level: Blue
Stakeholders: Advisors, Financial Analyst
Preconditions: User is logged into the portal and has access to student data tools.
Minimal Guarantee: They are taken to a result page with no results and a message appears saying they don't have access to tools relying on student data or that an error has occurred.
Success Guarantees: They are taken to result page that is populated with tools that utilize student data.
Flow of events 1. User is logged into the portal 2. User clicks the students button within the navigation bar 3. The user is taken to a results page that contains a bunch of tools that use student data.

Extensions 3. User doesn't have access to tools that require student data 3.a.1. A popup notifies the user that they don't have sufficient privileges to access these types of tools

Use Case #7

Title: Finding a video tutorial
Description: How a user would find a video tutorial to learn/relearn how to do something on the portal.
Triggers: User clicks the help button
Primary Actors: Advisors, Financial Analyst
Level: Blue
Stakeholders: Advisors, Financial Analyst
Preconditions: User is logged into the portal.
Minimal Guarantee: The user is taken to the tutorial page.
Success Guarantees: The user is taken to the tutorial page and finds the video tutorial they were looking for.
Flow of events 1. User is logged into the portal 2. User clicks the circle with the question mark inside of it at the bottom right of their window 3. The user is taken to a tutorial page 4. The user clicks on one of the video thumbnails 5. The user is brought to a video tutorial
Extensions 4. User doesn't see the video tutorial they want 4.a.1. The user can request a video tutorial using the request tutorial button.

Use Case #8

Title: Finding an interactive tutorial
Description: How a user would find an interactive tutorial to learn/relearn how to do something on the portal.
Triggers: User clicks the help button
Primary Actors: Advisors, Financial Analyst
Level: Blue
Stakeholders: Advisors, Financial Analyst
Preconditions: User is logged into the portal.
Minimal Guarantee: The user is taken to the tutorial page.
Success Guarantees: The user is taken to the tutorial page and finds the interactive tutorial they were looking for.
Flow of events 1. User is logged into the portal 2. User clicks the circle with the question mark inside of it at the bottom right of their window 3. The user is taken to a tutorial page 4. The user clicks on one of the video thumbnails

5. The user is brought to a video tutorial 6. The user clicks the “interactive” button
Extensions 4. User doesn’t find the tutorial they want 4.a.1. The user can request a tutorial using the request tutorial button.

Use Case #9

Title: Finding the SQL queries used in a report
Description: How a user would find all the SQL queries that were used to grab the data to create the report.
Triggers: User clicks the “SQL Queries” tab on the report page
Primary Actors: Advisors, Financial Analyst
Level: Blue
Stakeholders: Advisors, Financial Analyst
Preconditions: User is on a report page and has sufficient privileges to see SQL queries
Minimal Guarantee: There is a button to request the SQL queries
Success Guarantees: The SQL queries that were used to grab the report data is shown
Flow of events 1. User is on a report page 2. User scrolls down to the extra information part of the page 3. User clicks the “SQL Queries” tab 4. User is shown the SQL queries that were used for the report
Extensions 4. User doesn’t have permission to see the queries 4.a.1. The user can request the queries for the specific report pressing the button in the sql queries tab.

Use Case #10

Title: Finding similar reports
Description: How a user could discover reports that are similar to the one they are using
Triggers: User clicks the “Similar Reports” tab
Primary Actors: Advisors, Financial Analyst
Level: Blue
Stakeholders: Advisors, Financial Analyst
Preconditions: User is on a report page
Minimal Guarantee: There is a button to request similar reports
Success Guarantees: Similar reports are shown
Flow of events 1. User is on a report page 2. User scrolls down to the extra information part of the page 3. User clicks the “Similar Reports” tab 4. User is shown similar reports 5. User can click any of the reports to go to their report page

Extensions

4. There are no similar reports that exist

4.a.1. The user can request for similar reports to be created

7. Accessibility Requirements

The new consolidated portal is prepared for everyone, regardless of disability type or severity of impairment. Our websites will strictly follow the Web Content Accessibility Guidelines (WCAG), aiming to provide all necessary tools or alternatives for users who need them. According to WebAIM, the accessibility of our portal is going to focus on four categories. In terms of **perceivability**, every single non-text content has some sort of text alternatives for substitution. Images are accompanied by alt texts; auditory contents and videos are transcripted into descriptive texts or subtitles. We are not going to rely on utilizing substantial colors to demonstrate information. Even if we do, the colors will be strongly distinguishable and easy to recognize. Users with visual or hearing impairments may access the system and acquire data using our portal just like normal users. In terms of **operability**, our portal is heavily dependent on the function of a keyboard. The functionality of every website will not be affected without using a mouse or touchpad. There is not any time-limited application or page, and the authorization of UW NetID is constant and reliable. Potential inactivity from the user is going to be notified and warned for loss of data if it is not stored in advance. All tutorials and other navigation process provided can be skipped and repeated. The step and sequence of the current webpage will be indicated. The purpose and description of each link will be clear and intuitive. In terms of **understandability**, a google translate API will be embedded on all the pages of the portal. With the support of google translate, the portal will be available in 102 languages besides the original English version. An automatic suggestion will appear if the users mistakenly type the words or give ambiguous entries. The position of each element on web pages will not easily change or move, which ensures everything can be consistently identified by the users without much effort. In terms of **robust**, each page of the portal will be checked by HTML validator before the official release, as we intend to avoid any syntax or parsing error. ARIA alert will inform the screen reader or other assistive technology users when a significant status message pops up.

8. Security Requirements

The new system will need some security requirements. The solution must be FERPA compliant which means student data must be protected. This will be done through the UW NetID authentication program. This will make sure people logging on to our system will be who they say they are. Additionally, permissions are attached to UW NetIDs so with this method we will be able to verify who can have access to which information and reports. Data in our system will be protected as well. Though this part won't be handled directly by our system solution specifically, standard UW IT practices mean data will be encrypted and protected at rest and in transfer. Finally, our website will follow the HTTPS format.

9. Architecture

The architecture of our solution will exist in four locations. First, the data is stored on Microsoft SQL servers. The physical servers will follow the specifications as laid out here which includes specifications such as recommended 2GHz processor and 4GB or more RAM. The next location of our architecture is the Tableau server which will take in data from the SQL servers via ETL commands and transformed into visualizations. Next, the visualizations will be hosted on the website. The website will be made with a combination of HTML, CSS, and Javascript. Users will use their own devices to access data. This could include computers (Mac/Windows/Linux) or mobile devices (Android/iOS). We must encapsulate as many devices as possible in the ever-increasingly mobile-dependent world. These user devices will activate SQL queries whenever they click on a search result, asking the database for information about their desired subject or topic. We will aim to keep the existing servers in order to minimize the costs of more servers.

10. Appendix

10.1 Glossary

Portal - The portal is another term for solution or website we are proposing.

UW IT - The organization that manages the tools we are trying to improve.

Tools - A tool is a report page or definition page.

BI Portal - Stands for business intelligence portal. This is one of the current tools that are used for finding reports and generating visuals.

Knowledge Navigator - One of the current tools used for finding reports and definitions in the database. Also allows users to get cool visuals to see connections between the different definitions.

UW Profiles - One of the current tools for finding different reports revolving around student data.

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