Personas Help Understand Users' Needs, Goals and Desires in an Online Institutional Repository

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Abstract—Communicating users' needs, goals and problems help designers and developers overcome challenges faced by end users. Personas are used to represent end users' needs. In our research, creating personas allowed the following questions to be answered: Who are the potential user groups? What do they want to achieve by using the service? What are the problems that users face? What should the service provide to them? To develop realistic personas, we conducted a focus group discussion with undergraduate and graduate students and also interviewed a university librarian. The personas were created to help evaluating the Institutional Repository that is based on the DSpace system. The profiles helped to communicate users' needs, abilities, tasks, and problems, and the task scenarios used in the heuristic evaluation were based on these personas. Four personas resulted of a focus group discussion with undergraduate and graduate students and from interviewing a university librarian. We then used these personas to create focused task-scenarios for a heuristic evaluation on the system interface to ensure that it met users' needs, goals, problems and desires. In this paper, we present the process that we used to create the personas that led to devise the task scenarios used in the heuristic evaluation as a follow up study of the DSpace university repository.

Keywords—Heuristic Evaluation, Institutional Repositories, User Experience, Human Computer Interaction, User Profiles, Personas, Task Scenarios, Heuristics.

I. INTRODUCTION

THE system we evaluated is an online Institutional Repository (DalSpace) that "collects, preserves and distributes digital content produced by members of the Dalhousie community" [3] [4]. This repository contains a variety of documents that can be generally classified into two main types: scholarly materials and administrative documents [3]. To understand who is using this particular service, we needed to investigate the potential user groups and their typical tasks. To accomplish this, we chose to create 'personas'.

Alan Cooper introduced the idea of Users Profiles or "Personas" in 1990 [1] [7]. According to reference [6], user profiles and personas are similar methods for creating a fictitious person and collecting information to describe a potential user group [6] [11].

The purpose of a user profile is to establish basic knowledge of a certain type of user groups [1]. Reference [9]

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describes three methods: Qualitative Personas, Qualitative Personas, Quantitative Validations, and Quantitative Personas. They recommend starting with qualitative method should be engaged to gather information as a base line to build on for further research [13]. We decided to create the personas based on data collected during the focus group meeting and the interview. This paper proposes the use of focus group and interview methods to help create personas that represent potential end users of a university repository service.

The motivations for conducting the focus group meeting and the interview are to investigate the target users and the problems they experience while using university repositories, and to create a reliable list of tasks based on these personas. The benefits from previous studies would create more focused aspects, as we can build on the existing research. However, the research in this paper can be as a first step toward improving the University repository service. Investigating the potential user groups of such a service is another motivation. As mentioned earlier, University repository users have not, thus far, been either known or studied. Knowing a potential user group for a growing technology is crucial, assures play a vital role in increasing the acceptability and effectiveness of the IR systems. Finally, the results from the focus group and the interview are intended to create a reliable list of tasks that can be used in future research to evaluate the university repository. The task scenarios help evaluators to focus on specific elements included in the personas.

We would like to learn about these specific users' types, needs, problems, and desires regarding an institutional repository that belongs to universities. After collecting all of the information, we wanted to design task scenarios for evaluating the user interface.

The primary contribution derived from this research is a general enhancement of the university's services, while secondary contribution is to add to the literature review regarding the conducting of heuristic evaluations on institutional repository systems. First, we created four main personas that precisely describe potential user groups of the university repository. The four main personas could serve as a starting point to investigate potential end users in future research, which eventually might be beneficial in a redesign. The main contribution at the university level is providing the development team with information about potential user groups, along with a list of usability problems whose resolution might increase the acceptance of the university repository. The second contribution is using the personas as a tool to design task scenarios that can be used in usability evaluations of the service. Both the personas and the task

scenarios assist in uncovering usability problems that have not previously been investigated at the university repository.

This paper starts with a background summarizing some evaluation approaches, followed by our research questions. The study methodology focuses on describing the steps we followed to create the personas. The results and discussion sections are divided into two main parts: personas, and task scenarios.

II. BACKGROUND

Various methods have been applied in user systems. We decided to use personas in combination with task scenarios to perform a heuristic evaluation as one of the usability inspection approaches.

The definitions of these usability inspection methods are summarized in Table I.

TABLE I
USABILITY EVALUATION METHODS

Authors	Methods	Definitions
Nielsen [19]	Heuristic Evaluation	Evaluation is done by a small set of usability experts to produce a list of potential problems in a user interface.
Kahn and Prail [16]	Formal Usability Inspection	Formal usability inspection is accomplished by designers and development teams reviewing the users' tasks performance.
Wharton et al. [22]	Cognitive Walkthrough	The cognitive walkthrough method focuses on the learnability and the ease of use of a user interface.
Lancaster [18]	Paper Prototyping	Evaluating the paper-version of an interface, which can be done in the early design stage.
Usability Methods [21]	Contextual Task Analysis	This is a research method that focuses on observing users while performing tasks and conducting one-on-one interviews regarding users' behaviors.

Alan Cooper first introduced the idea of Users Profiles or "Personas" in 1990 [1]. User profiles and personas are similar methods for creating a fictitious person and collecting information to describe a potential user group [6]. They generally help establish basic knowledge of a certain type of user groups [1].

The reason behind choosing the personas method as a design tool is that it is beneficial in drawing a design/features scoop for designers to meet certain user groups' needs in the early design stage, which minimizes recourse consumption [13]. The most significant benefits are that using personas leads to better decision-making about the design and also limits goals around what users need [8]. Reference [7] agrees that designers and developers should use user profiles as the basis of conducting usability evaluation during redesign [10] [23].

According to [17] institutional repositories provide universities with "a set of services that a university offers to the members of its community for the management and distribution of digital materials created by the institution and its community members." It is the commitment of stewardship of the "long-term preservation where appropriate, as well as organization and access or distribution". This long-term preservation has led to considering repositories as important extensions of digital libraries [20], as they have the potential

benefit of improving scholarly communication, providing open access service and allowing content management [14] [15].

A. Research Questions and Objectives

We planned for personas in combination with task scenarios to serve the ultimate goal of conducting a heuristic evaluation. The research questions were intended to uncover usability problems and investigate the evaluators' performance regarding applying this particular usability testing method. To do so, we conducted a focus group meeting and an interview to create the personas. From the personas, we formed the task scenarios. In creating the personas, we aimed to answer the following research questions:

- Who are the users of DalSpace?
- What do they want to achieve by using DalSpace?
- What are the problems they face using DalSpace?
- What should DalSpace provide them with?

III. METHODOLOGY

To create the personas, we ran a focus group of 6 (undergraduate and graduate) students. All participants had used the online repository at least once. We took notes and audiotaped the focus group session, which took about two hours. During the focus group, we asked the participants to describe themselves (demographic information, their Web use, etc.). We also asked them to discuss how and when and they use the online repository and to give examples of the type of tasks they used the repository for. Additionally, we asked them to discuss any problems they had with the system, what they liked about it, and any suggestions they had. Finally, we asked the participants to identify possible user groups of the repository and the attributes for each group. The participants were then asked to help with the design of the personas by assigning a name and age to each user group. As well, we conducted an audiotaped interview with a librarian who has direct contact with users of the online repository. The interview took about an hour. The questions we asked mainly focused on the same attributes discussed in the focus group meeting. The librarian was queried about his experience as a searcher and as a librarian who helped students find academic materials. The problems that the interviewee faced, both as searcher and librarian, while using the university repository were noted. The interview questions helped us gain basic information about the university staff as end users.

We organized the comments and points as follows:

First, the participants suggested some user groups that might use DalSpace. Then, for each user group, the participants started discussing these attributes for each user group. The user groups were discussed separately. Next, participants assigned a name and an age for each user group to encourage the discussion members to get involved. This was done to help the development team focus on the user group represented and to think about an individual's needs, abilities, problems and suggestions rather than those of a large number of users. The discussion points were in the form of questions and ideas that should be covered during the discussion. The

data was organized as attributes under the suggested user groups to form the user profiles, as follows:

A. Undergraduate Student User Persona

- Demographic Information: Rebecca, age 20, programming and graphics.
- Web use: Mac laptop, working on her programming skills, experience in exploring webpages, uses Google and Google Scholar.
- Tasks: Interested in academic articles. They should be organized according to department and should be able to be fully read and downloaded. They should also have an interface that is easy to perform tasks. This is a personal account to help her in managing documents. The search function is very important for her. Furthermore, she wants to have the search results. She usually uses Google and Google Scholar as a first step in searching for a particular document.
- Frequency: She is not the target user group and she would not use DalSpace until she has to do some assignments or course work.
- Problems: She does not know that there is such a service under the libraries collections. A link in each department would help spread the word about DalSpace. Tutorial video. No experience with other institutional repository systems.
- Desires: To share her projects and assignments as well as different types of materials, teaching slides, and assignments. She wants to be able to comment on the contents and access faculty members' publications.

B. Master Student User Persona

- Demographic Information: Thomas, age 25, Information Science department, first year in the master program.
- Web use: Personal computer at the department and a laptop, experience in surfing websites and searching databases for academic articles. He uses the university's online libraries and free online libraries.
- Tasks: Submitting to the university repository is mandatory for masters' theses. He is interested in searching for information on thesis structure and style guidelines. He also searches for conference papers, academic articles and journals and prefers to know document descriptions before downloading them, as he is interested only in papers that focus on his major. He needs a service that is well organized and sends email notifications about new work in his area of interest. As well, he is interested in reading the theses of other students who work under a specific faculty member's supervision.
- Frequency: For thesis and course-related work.
- Problems: No previous experience with the university repository until he knew that he has to submit the thesis through it electronically. Advanced search function should be implemented as well as full text documents be made available.

- Desires: Personal account, list of online libraries and databases, share different types of documents, tutorial on how to reach and use DalSpace.

C. PhD Student User Group

- Demographic Information: Ishan, international student, PhD program, follows the program timetable, 26 years old, strong in writing and reading academic papers, TA.
- Web use: Experience in searching libraries and online databases, advanced Web expertise due to his expertise in computer science area.
- Tasks: E-mail notifications of upcoming conferences. He seeks easy access to the collection from different places as well as to other repository systems. He uses the PDF/A converter, along with advanced search features and uploading and downloading of different types of documents.
- Problems: Find all theses to read in his area of interest, including those associated with a specific faculty member. He has a general lack of knowledge about the services that the university repository offers.
- Desires: Thesis templates, convenient tool, all information about the PhD degree according to the department.

TABLE II
SEARCH FOR A KEYWORD/THESIS TITLE

Goal	The goal is to walk the user through the basic steps of searching using the main interface before logging into the system.
Type	Regular Task
Assumptions	• Since there are two search bars, users have to decide which one to use: the one on the top right, or the one between the text in the middle of the home page. • The system might return no search results.
Steps (use case)	1. The user types the keyword/thesis that he/she wants to search in one of the search bars in the main menu and selects the GO button. 2. The system automatically displays the search results interface. 3. The user has to scroll down to see the search results because the system offers some search filters and scopes. 4. The list of documents is presented. 5. The user has to click on one of the documents. 6. The user clicks on the desired document. 7. The system automatically displays the document information (title, author, date posted, URL, name, description, size and type of the file). 8. The user scans the abstract.
Possible Problems	Alternative Cases: 6.1 If the user is not interested in any documents, the user should search again or refine the search. 8.1 After reading the abstract, the user should proceed to step 9 if still interested.
Scenario	You have opened the home page for the Dalhousie repository website and want to search for a keyword/thesis. You will take a quick look at the home interface and choose one of the search bars to type in "NFC-Enabled Smartphone Application for Drug Interaction and Drug Allergy Detection". Explore the results and try to read the abstract of the document.

IV. RESULTS FROM THE FOCUS GROUP AND INTERVIEW

The final results include four personas and 18 task scenarios to be used in the heuristic evaluation method. An example of the master student persona is shown in Fig. 1.

Our findings from this study suggest four main user profiles that represent four potential user groups, as follows:

- User profile #1: Rebecca, Undergraduate Student (Fig. 1)
- User profile #2: Thomas, Master Student
- User Profile #3: Ishaan, PhD Student
- User profile #4: Dona, A construction and reference librarian

An example of a task table is shown in Table II.

The personas are used to create task scenarios and assign priority to the tasks, while the tasks were used in the evaluation process in further research. A list of all tasks is shown in Table III.

TABLE III
LIST OF TASKS

No.	Task	Type of Task
1	Find DalSpace Task	Important Task
2	**Search Tasks:** 2.1 Search for a thesis title	Regular Task
	2.2 Search within a scope	Regular Task
	2.3 Apply filters to the search results	Regular Task
	2.4 Apply sort options to the search results	Regular Task
	2.4 Download/Open Task	Important Task: This can be considered as a subtask of all subtasks.
3	**Browse Tasks:** 3.1 Communities' collection from right side.	Important Task
	3.2 Browse by issue date	Important Task
	3.3 Browse by author name	Important Task
	3.4 Browse by document title	Regular Task
	3.5 Browse by subject	Important Task
	3.6 Browse the submit date of the document	Regular Task
4	**Account Tasks:** 4.1 Login via Net ID Authentication	Unusual but Critical Task
	4.2 Register as a new user	Unusual but Critical Task
	4.3 Login via Registered Users Password Authentication	Unusual but Critical Task
	4.4 Password reset	Unusual but Critical Task
5	Submission	Important Task
6	Restricted Content	Critical Task

V. DISCUSSION

We organized the discussion into two main themes around the personas and the task scenarios.

A. Personas

1) Undergraduate Student Persona

Based on comments from the focus group, undergraduate students are less interested in the online theses' collection and historical material and are thus not a target user group. Nonetheless, because some honors students might be interested in searching for and reading graduate theses, the system interface should be easy to use. In other words, undergraduate users should not be required to have a technological background to use the system. One of the participants (P4) noted: "Undergraduate students will not use [the system] until they have to use it. The interface should not require a technological background; they should just scroll the mouse to get what they want." As well, another participant (P6) identified that having accurate search results would save time and effort while looking for a particular document. The participant strongly suggested having a spelling correction feature, as correct spelling is vital for producing precise search results. Moreover, the participant felt, that undergraduate students are used to searching first through Google and Google Scholar to find a specific document. If every document in the online system is listed by Google, it would lead them to the university system if they followed a link. This could be considered an important feature that might help both university students and the general public searchers. On the other hand, it might be considered as a detriment, as it makes it easier for undergraduate students to use Google and Google Scholar instead of going directly to the repository system.

P6 suggested that if there were a function that allowed others to comment on the content, this would encourage undergraduate students to use the university repository more often. However, P4 stated that it should only host documents, and there is no need to have a comment function. This difference of opinions led to an important trade-off: It is important for a generation that is used to dealing with computer technology to communicate with the content to add to the satisfaction level of using it. On the other hand, some participants thought that having the ability to comment would create complicated interfaces, as P4 pointed out.

All six participants agreed that the university repository should host teaching materials, slides, and assignments. This would extend the variety of the types of end users who might be interested in the content. However, this might also be frustrating, because faculty members already have their own websites that contain their teaching materials. It might be easier for students to find all of the documents they need in one place (the university repository), either for their course teaching materials or for academic documents they need for course work.

2) Master Student Persona

Master students face some particular difficulties when they learn about thesis structure because every department has its own preferred style. The solution is to provide a guideline through DalSpace that explains how each department wants their thesis documents structured. P5 commented that having some idea about particular supervisors' approaches (from viewing previous graduate students' theses) might assist in helping potential master students make decisions about which supervisor to select.

Students are interested in having previous students' theses not only listed in the online thesis collection, but also listed under the supervisors' lists of theses. This would help international graduate students who are interested in having opportunities to match their interests and would also help graduate research at the university.

Persona #1: Rebecca - Undergraduate Student[1]

Rebecca is a full-time 2nd year undergraduate student in Computer Science. She is 20 years old. She is interested in programming and graphics.

Technological Background
Rebecca has a Mac laptop. She is building her technological and programming knowledge through the courses that she studies in the computer science program. In terms of her web use experience, she has experience surfing websites; however, she is more experienced using Google and Google Scholar to find resources and papers for course work. She is afraid of adopting new systems because she anticipates wasting time learning a new one. If she has any problems with the online repository, she will abandon the website and use another one instead.

Tasks - What does she want from the system?
- She wants the academic articles and documents to be organized under communities of the university's departments. She needs this feature to assist her in searching for a particular document easily. For example, she needs to check the Computer Science community to do her assignments. She might user other communities' collections depending on the topic of the assignment.
- She wants to be able to read and download digital documents and sometimes able to obtain printed copies for annotation purposes.
- The interface should be easy to explore. She wants to be able to figure out where she is in the website and where to go next.
- She would not use the system until she is required to (download or print) some documents from it. For example, if a professor asks her to find a particular paper in the system as a part of the course work then she will, otherwise she would use Google or Google Scholar and then proceed to the convenient library resource if she could not find the desired document.
- She wants to have a personal account to help manage her documents and would bookmark some for future use.
- She prefers to have access to the content of the system from both home and the university campus.
- In terms of how frequently she will use the system, she will use it whenever needed to accomplish assignments, reports and search for course related work.
- She wants to be able to refine the search results by author's name and date in which the document was issued, as well as title, which would require an advanced search tool.

Current Problem(s)
She does not know about the system and she is wondering if she can have a link in the department home page or have someone talk about it in the orientation day. She also thinks that having a tutorial video in YouTube about why and how to use they system with a link on the interface of each faculty would be helpful. She is not aware of other universities repositories that she can use beside this system.

Desires
She wants to be able to upload her projects that she completes in every course. She would like to be able to find and access more than academic papers or community collections; she wants to obtain teaching materials, assignments, comments on content, professors' pages and their publications. She needs an automated spelling correction feature in the search bar.

Fig. 1 Persona 1 - Rebecca, Undergraduate Student [23]

P1 suggested that masters' students are more interested in exploring current work in their area of research than in viewing previous publications. Helping them explore recent work could come in the form of e-mail alerts after they register and assign an interest area. Getting the university repository to power this feature would help students stay up to date with the latest research that will support their own work. The importance of this feature relies on adding to the graduate students' level of knowledge on published recent work, which consequently adds to the level of scholarly output produced by the university's graduate students. Another important observation that was made by P6 is that master students want to know more about the researchers and authors of a particular paper and have the ability to explore all of their publications. We think that these points are important for graduate students, especially master students; because this would save them time in doing extra search tasks to get find what they want in specific areas of interest.

All 6 participants agreed that if the university shares some content with other repositories, they want to know if they would be allowed to access these other repositories' content.

P1 commented that this would save the students money, should they would otherwise need to pay to access an academic paper.

3) PhD Student Persona

The only way to submit a masters or doctoral thesis to the Faculty of Graduate Studies is through the university repository. P3 is a PhD student and represents the PhD user group. This participant had some issues related to the DalSpace interface. First of all, the interface could not help the participant to save a draft and then continue working on it before submitting the electronic copy. The participant had to start again every time and upload a new version of the thesis.

For the PhD program, there is a clear plan for each term that includes some courses, research aptitude defense, proposal defense, and the final PhD defense. P2 stated that having guidelines and templates of all the research formats and structures to guide them through the program should be included in the university repository. P3 also said that he was unaware as to whether or not the research aptitude defense is required to be submitted online through the university repository.

All 6 participants agreed that being able to access the supervisors' information should include links to all their theses and publications. They wanted to be able to explore the interests of their potential thesis supervisor to help ensure they are making the right choice, as discussed in the master student user group.

4) Construction and Reference Librarian Persona

The lack of knowledge from students in the focus group made this question particularly salient: If only a few people were to use the university repository, who would they be? Participant 7, who represents the construction and reference librarian user group, stated that faculty members and staff might be interested in what currently happens at Dalhousie. Students who are searching for master and doctoral theses to read or who are reading references in the bibliography can be potential end users as well. Moreover, depositors can be staff, faculty members and students. Some of the participants represent two roles, such as a staff member who is both a researcher and a depositor. Furthermore, the general public might want to gain access to the non-restricted content. Other potential users include anyone who is interested in what is happening at Dalhousie and people who are interested in the digitized collections from the medical schools because they digitized them — Librarian.

The librarian noticed that, in the search fields available in the search function, the fields do not search the content of document. In the depositing process, the fields are filled in to match the search results, but the results from the search process do not provide the intended documents. The librarian suggested that this is because matching the search keyword with these fields does not provide accurate search results.

We think that this problem has a high priority, mainly because students from the three users groups placed strong emphasis on the search tool and its results. The search feature is one of the most important tasks and all user groups agreed on its importance. The current university repository does not support the function of knowing when a paper has been read publically, information that is useful for rating purposes and for searching materials from a specific period.

The librarian suggested that statistical analysis software is essential. It could provide useful data for the university in terms of having statistics on who is using the university repository, how many times they used a particular document, and from which countries the most accessed documents are coming from. Considering this point will help the university to attract graduate students and researchers who share the same interests to work for the university. This was pointed out as a kind of substantiation of links between the university and international users of the system.

The university repository provides open access to documents that are stored in the university repository. The librarian stated that people who are depositing materials are agreeing with the idea of having their documents read publically, effectively promoting their work to anyone in the world. Otherwise, authors can apply restrictions to their documents. Graduate students need to know about the online theses.

Compared to other studies that have been conducted to serve the same goal [2], [5], [10], there are some differences in our context. The researchers in [2] used personas to help the design team explore the tasks that users perform by understanding the personas' scenarios, while [12] extended the use to include "developers, testers, writers, managers, marketers and others." Therefore, personas are mostly used to increase the companies' services and products [6]. Our context relies on delivering an academic output to students, members of the university, and the public. In other contexts, the development team and the customer services team in companies meet and discuss the users' needs without involving any end users. In contrast, our study focused on real end users who were involved in a focus group meeting and an interview, which helped in receiving direct feedback from the system's actual end users rather than just potential ones.

B. Task Scenarios

The task scenarios were designed based on the personas and focus on the most important elements derived from the personas. The results revealed some potential users groups, such as undergraduate students, graduate (master and doctoral) students, and librarians. These tasks can be given to evaluators to help inspect the interface according to a set of task scenarios. Each table contains full description of each task, as follows:

- The goal of the task;
- The type of task (e.g., regular, important, critical);
- The actual steps that a typical user would follow to perform the task;
- The possible problems that users might face during performing the task;
- Time for an expert to reach the goal; and
- The scenario.

The table task, as shown Table II ,is designed to provide evaluators with a good background about each task. The tasks would draw their attention to the main elements that they might want to focus on. This helps evaluators to understand what the university repository offers and provides a general sense of the layout of the interface, which helps them carry out the evaluation smoothly. The tasks are classified into the following three categories.

- Regular tasks: tasks that users would carry every time they log into the system.
- Important tasks: major tasks that users would perform, such as submitting content.
- Unusual but critical tasks: tasks that are performed less frequently, such as registering or browsing restricted content.

While designing the tasks, we noticed some quirks with the system. First of all, we could not design a task that deals with an advanced search inquiry because the system does not support it. However, there are some options to refine searches (such as filters) that users can apply to their search results, but these filters cannot be applied all at once. Filters have to be applied one at a time to author, issue data, or subject. We wanted to design a task where users can apply more than one search function at once. For example, the task was designed to focus on searching using three keywords: a year, an author, and a subject. The system does not support such an advanced search strategy. Instead, the tasks were designed that applying the filters to refine the search results using author, issue data, or subject filters, such as tasks 3, 4 and 5, can perform them.

Designing these tasks not only allowed us to explore the interface and the features' powers, but also showed the aspects that should be inspected and assigned as a high priority tasks, based on the personas. The high priority tasks are: Task 1: find DalSpace; Task2: search for a thesis; Tasks6 and 7: browse a collection; Task 17:do submissions; and Tasks 3 and 18: browse restricted content. The rest of the tasks summarize the features that are powered by the interface.

As mentioned earlier, this priority was based on the personas when participants focused on main features that should be powered by the university repository. The task "Find DalSpace "was designed because 5 out of 6 participants did not know about the university repository before they were asked to explore it and to carry out the discussion. Not knowing how to get to the university repository, the students first searched for it using Google. The university repository is placed under the library collections.

In terms of searching for a thesis (Tasks 2, 3, 4 and 5), the participants focused on the search feature. They want to have precise results even when they are new to the system, as derived from all personas. Another important task is browsing a specific community's collection (Task 7). All of the participants from all undergraduate and graduate (master and doctorate) levels agreed that when they look for a supervisor in a university, they want to be able to browse the community collection to which the particular supervisor belongs. P6 in the focus group meeting explained that he/she searched for a thesis on a specific topic under a specific subject of the university to select a university to study in as a graduate student or choose a supervisor for the graduate program, which Task 11 covers. Therefore, three personas out of four assure these tasks will be focused on during the evaluation.

From master and PhD personas, submitting a thesis or a document (Task 17) is the main task for graduate students as depositors. We assigned this task as high priority because every graduate student and honors undergraduate student will use the university repository to submit a thesis or a research paper to the Faculty of Graduate Studies. Using the university repository in this case is mandatory, so evaluators should focus on this task to be able to improve it. Regarding librarians as depositors, they use an administrative interface, which is out of the scope of our research.

In terms of restricted access (Task 18), if the user decides that a thesis should be restricted from the public, the thesis will not be uploaded to the university repository. That means the uploaded documents will be in the graduate studies collection but not in the online collection. In addition, the collection of the Board of Governors and Senate Minutes prior to 1986 is restricted. Some of the minutes included commentary and discussions that the university considered to be sensitive and should not be made available to the public, hence the "restricted" designation on minutes from that period.

It is important to know that, in the communities' collections, there is a collection that is assigned as restricted access: "School of Information Management Digital Image Library (Restricted Access)". However, this information is not clear from the system's responses, error messages or description when selecting this link, which makes it difficult to understand what this content is and why the collection is restricted. Therefore, evaluators have to explore this part of the interface to inspect the performance of the system, which is not based on personas' preferences.

To download or open a document from DalSpace (Task 6) is a feature that allows the users to open a document online or download it to have a digital copy of the document. The choice depends on users and the style that they prefer to read the document in we assigned a low priority to this task because evaluators do not have to perform the task; they can just read the description in the task table.

There are two ways to log into the system (Tasks 13 and 15). The first way is logging in via NetID as a university member. The other way is to log in as a registered user who first has to register (Task 14) with a valid e-mail account. These tasks are not considered everyday tasks, but they are critical because users need to know that they have the opportunity to explore the content of most of the collections via the public interface without the need of logging into the system. However, to be able to submit a document or a thesis for uploading, users must be registered. The critical concept is derived from the need to login whenever users want either to submit a document or browse restricted content.

VI. CONCLUSION

Four main personas were created to describe four potential user groups who might access the university repository. Each one describes the users' demographic information, technological background, tasks, desires and problems. These profiles helped to bring the user groups to life and to keep their needs in consideration during the development of the system. Also, this aims to build our background about who the users are, what motivates them to use the repository, and what they perform in using the service. This information then assists us in building a list of task scenarios that are applicable to a usability testing technique that can uncover usability problems and might ultimately improve the university service. In short – students might use the university repository if their needs are met. Having the opportunity to explore their needs would make them more interested in using the repository and its content, and this might see it used more often and more deeply than before. We recommend using task scenarios that are created based on personas in usability testing for any type of online service, and we highly recommend using such scenarios for university repositories. This approach would help in answering some questions raised around why students stop using the system.

Quantitative analysis should be performed to validate the personas. Quantitative data can be gathered by conducting surveys or questionnaires or by tracking user behavior and tasks while using the system. Creating more user profiles to represent other user groups should be investigated to build on existing user profiles and help in future user research. Other suggested users profiles would be employees in the Graduate Studies as depositors and special needs students' user groups. Investigating the university repository administrative interface

and interviewing the intended users should also be taken into consideration as options for future research.

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