Human - Computer Interaction and Design Problem

Chosen Interface: University of Toronto Mississauga Academic Calendar

Group 5

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Problem Description

The University of Toronto Mississauga (UTM) academic calendar interface is designed to serve the purpose of providing accessible and concise information to students, parents, staff, and external institutions, about the courses and programs offered at UTM. The interface is far from a user-centric interface, where common functionalities such as search navigation, hierarchical information divide, and overall aesthetic is overlooked to ensure that adequate information is conveyed effectively. A primary focus on solely information can pose great user experience (UX) and usability issues, hence it is important to consider how the information is displayed, organized, and designed into the interface. Consequently, the underlying problem the redesign will aim to solve is navigation and UI and will strive towards creating an intuitive navigation system and information architecture (IA). For reference, information architecture is the structural design of information, this includes navigation (global and local) and how information is organized within a page (Rosenfeld, Morville, & Arango, 2015). The new design will focus on creating a diverse and user-centric interface, which fulfills both content and aesthetic needs, as well as maintaining a professional boundary for UI and interface layout. When designing, UI elements are crucial to create impactful websites, and the main problem with institutional websites tends to be the lack of human-computer interaction elements, like error handling, system feedback, and content grouping — UI included.

In terms of user groups, the UTM academic calendar has four main users: students, staff, parents, and external institutions. Additional users can be subcategorized into these main four categories. When designing any interface, the users are the key stakeholders that need to be accounted for, hence cannot be overlooked. The user needs are the primary focus and interfaces should be specifically designed to ease usability for these groups. A more in-dept user analysis is conducted later in this document, but it is important to highlight that the redesign should be suitable for aspiring students alongside current ones, so it is likely that some of the user base will be novice to the platform. Keeping this in mind, the redesign should be able to resolve the issues related to navigation, IA, and UI, specifically tailored for novice users. In this case, understanding how users interact with this current version of the UTM academic calendar website should be enough to understand the navigational holes and room for improvements.

Finally, selecting the appropriate interface for this redesign project was especially crucial to ensure that the proposed changes aim to better user experience, this includes ease in navigation, appealing UI, as well as appropriate application of design principles. Above all, the redesign will focus primarily on the information architecture, hence ensuring that all elements and pages of the site are accessible and serve a purpose to all the users.

Analysis of the Context, Content, and Users

Context

Goal

As aforementioned, the University of Toronto Mississauga academic calendar is an interface used to assist users to look for information related to program/course selection, degree planning, checking requirements and other degree related aids. Based on the problem description, the UTM academic calendar has extensive information presented in both global and subpages, making it information dense. Although the purpose is to provide an information interface, the webpage overlooks UI, IA and organizational structure associated with effective interfaced. This disorganizing can result in usability and navigational issues (Rosenfeld, Morville, & Arango, 2015), making it harder to finding the relative information regardless of whether it is present in the interface or not. Hence, the goal of this project is to ensure that the holes in the design are accounted for, consequently improving the information architecture (IA), resolving navigational issues, and implementing HCI elements overall.

Stakeholders

The stakeholder of the UTM academic calendar include the teams which are responsible for maintaining the website (including IT support, web developers, software developers cloud services, etc.) (Rosenfeld, Morville, & Arango, 2015), the identified user groups, faculty members, school council members, and administration (career support, registrar, etc.). The stakeholders mentioned all have an interest in the success of the UTM calendar.

Audience

The UTM Academic calendar is intended for four categories of people: *students*, *staff*, *parents*, and *external institutions*. Students can be of both University of Toronto (any campus) or from other universities, and same goes for parents and staff. External institutions can include universities, colleges, or even companies who look forward to collaborating with UTM or need information about the degrees or courses offered. An example of when companies may find this site beneficial is when looking for the qualifications of candidates to hire.

Content Management

According to the UTM Reddit posts, the academic calendar is updated every year to ensure that the appropriate program and degree requirements are portrayed. For instance, UTM followed a POSt system, for which the school will need to update the academic calendar with the POSt requirements for each program. Oftentimes, this update is inaccurately portrayed, resulting in navigational complications and misleading information — discussed later in the document.

Usability Pros and Cons

Based on the user research discussed in the User section of this document, the user behaviour observations indicate that the search feature is ineffective and does not have error handling procedures in place. Additionally, if a user mistypes a term, the system feedback procedures do not suggest possible forms of action that can help resolve the error or hint at it. A pro factor of the UTM academic calendar is the assistance information which gives an overview of what the academic calendar entails and how to use the basic features — although this may be time consuming for the users.

Content

To review the pages of the UTM academic calendar and get an overview of the current information architecture, various methods can be used to assist in the analysis. For instance, the Noah’s Arch is a manual approach and requires a structured organization of each page or element of the interface (Rosenfeld, Morville, & Arango, 2015). However, for convivence, this analysis will utilize a digital analyzing tool referred to as the Content Auditor.

Content Auditor Findings Overview

The Content Auditor showcased significant information about the contents of the UTM academic calendar interface, with a greater detail on the multiple pages and external links. Firstly, the Content Auditor results suggest that the content word count is exceptionally high, which leads to a greater read time. According to the statistics in *Appendix C,* the average read time is approximated to be 148 minutes, and this is a per page average. This information supports the concluded problem in the problem description, regarding there being a greater focus on the information rather than the presentation. Information presentation is a lacking HCI element in the current interface because the Content Auditor results suggests the lack of alternative media sources — media sources are needed to ensure that the information is presented in an engaging manner. For instance, pictures, videos, or even audio is lacking, as according to *Appendix D,* there are zero media sources. However, after viewing the page-by-page analysis feature provided by the Content Auditor tool, it became evident that there are images in use, but on average they do not exceed more than 2 per page (including the banner that is present in all the pages) — an overview is available on *Appendix E*.

The table below showcases an overall summary of the common pages:

|  |  |  |  |
| --- | --- | --- | --- |
| Page | Approx. Reading Time (minutes) | Media Sources | Approx. External Links |
| Home Page | 2 | 2 | 9 |
| Course Search | 15 | 2 | 20 |
| Course Pages | 1 | 1 | 10 |
| Date and Deadline | 0 | 1 | 10 |
| List of Program Areas | 0 | 1 | 9 |
| Financial Aid | 4 | 1 | 18 |
| Fees | 9 | 1 | 18 |

Content Inventory Findings Summary

After a thorough analysis of the content pages of the UTM academic calendar website, it is evident that there is an information overload and a lack of media elements. Although the per page reading time is decent, the overall site reading time can reach a maximum of 1556 minutes, and this is only for the first 100 pages. This reading time reflects the frequency of external links on each page, which plays a factor in increasing the read time. Overall, the read time and media source ratio is not balanced, and because of this there is an information overload.

Now in terms of the navigation, the UTM academic calendar consists of a primary/global navigation, as outlined in *Appendix F*, and a local navigation, as outlined in *Appendix G.* These two levels of navigation are what users typically look at for information, and it is important to note that the global navigation is extremely vague and does not provide easy access to course searching features. Aside from the top navigation bar, the side navigation bar provides a menu and access to pages that lead to course offerings, program areas, certificates, etc. However, the issues lie within how this menu is presented and can be included as part of global navigation — common interfaces start at global and branch down, and the global navigation of the calendar is not suitable for the primary user group. For instance, the global navigation consists of a “student success” option, that branches further into pages like “officials of the university”. For students, this information being presented as a subpage in global navigation is pointless, especially since the site is used to provide information related to academics. In this case, including course search as a category is far more useful, and it can assist novice users as the interface would mimic more common interfaces. Additionally, as outlined in the Content Auditor summary, there are a few external links associated with each page — these links often take the users to other pages in the interface.

The UTM academic calendar interface showcases characteristics of a bottom-up approach, where all the information was determined prior to creating the organization system. The reason for this conclusion is due to inconsistencies in offered global navigation options, which portray a lack of user research and solely information overload. Most global navigation options seem out of place with the purpose of the UTM academic calendar interface, as they highlight categories relating to finance and policies. Although this information is crucial and needs to be present on a university website, including this information in global navigation defeats the purpose of usability and IA.

Format and Document Types Present

|  |  |
| --- | --- |
| Format Types | Document Types |
| * Text * Images * Tables | * Images (JPG) |

Users

The UTM academic calendar is primarily an information source for individuals who are seeking for course planning aid, career planning, meeting degree requirements or trying to determine if a candidate at a particular university has an appropriate skillset. All the purposes mentioned above serve to different users’ group, with the selection being: students, parents, staff, and/or external institutions. Part of designing a good interface is the ability to connect with users to understand their needs and areas where the interface does not meet them. Above all, since students have a higher use case for the UTM academic calendar interface, hence it is understandable to create an interface design focused on assist students with navigations, but also to include the necessary information that other users, like staff and external institutions may be looking for. A thorough analysis of the user groups is provided in the table below, all outlining the purpose, specific user, as well as frequency of use based on a scale rating:

Selecting User Representatives

The frequency of interface use is rated on a scale from 1-5, where 1 is least frequent and 5 is most frequent. Additionally, the **bold** users are the user representative used for data collection purposes.

|  |  |  |  |
| --- | --- | --- | --- |
| User | User Description | Purpose | Frequency |
| **Students** | Students that use the UTM calendar services are often from the University of Toronto university, specifically from the Mississauga campus. These students can also be from alternate campuses, or from different universities altogether. | * Degree and semester planning aid. * Requirements, both course and GPA (suitable for current, aspiring or transferring students) | 5 |
| **Parents** | Parents that use the UTM calendar services are typically related to UTM students. | * Research and planning | 2 |
| **Staff** | Staff using the UTM calendar may be from other campuses, alongside the Mississauga campus. | * Providing mentorship to students in need (career center) * Determining degree status of students, for graduation, enrollment, and fees purposes. * Course planning tool, for professors who want to fulfill the learning outcome of the course | 4 |
| External Institution | This user group can be further branched into academic institutions, companies, and other stakeholders who are not necessarily part of the education sector. | * Determining eligibility of transfer students * Accessing candidate skillsets before hiring | 3 |

After accessing the overall user groups, it is important to get data which can help to understand how representatives from each user group interacts with the UTM calendar interface. To do this, it is important to conduct usability testing, but for the purpose of this assignment, convivence sampling is the primary source of data collection. Convivence sampling is geared towards acquiring the opinions, both positive and negative, of easily accessible users from the list of user groups. For this assignment, the three user representatives are the ones with a greater frequency rating, but also most accessible for convivence sampling. This includes 1) students 2) staff and 3) parents.

Data Collection, Methodology and Findings

Identifying the representative users is the first step towards pinpointing the users and their purpose/ for using the UTM calendar interface, as well as how often the service is useful to them. The second component will be to understand how the current UTM calendar interface impacts the three representative users, and this can be accomplished via user research methodologies. It is important to note that for this assignment, convivence sampling is the most accessible form of gathering users due to time constraints and lack of resource, as aforementioned. For data collection, the primary method of data collection is *observation*, and the secondary method is through *Reddit* posts and threads.

As part of user analysis, observing how users interact with an interface is crucial in understanding effectiveness of IA, terminology misunderstanding, navigational issues, or level of boredom. All these factors play a role is either making or breaking a user’s experience with operating an interface, and as designers, the goal is to ensure that the experience is positive. The results of observing showcased these exact issues as outlined above, with the main issue being navigational related. The user group that partook in the observation process were students, both current and aspiring. The following table outlines the steps that each student took to navigate to the program requirements for forensic science, based on observation:

It is important to note that the observations are conducted based on the following elements and factors: accuracy of findings (landing on the accurate page depending on the assigned task), time and efficiency (how long it takes to complete the task and how many steps it requires), familiarity with interface (novice users may take more time to navigate when compared to current) and appropriate error handling (how the interface deals with the errors and how the users interpret them).

|  |  |
| --- | --- |
| Current student | 1. Clicked on “list of program areas” under the “academic offerings” side menu. 2. Found Forensic Science via the alphabetic ordering system. 3. Selected “Forensic Science – Major” option from the drop-down menu. |
| Aspiring student | 1. Uses search tool on main page. 2. Asked to find program requirements for forensic science. 3. Misspelled forensic as “forensick”, so the system was unable to process the search. 4. Corrected misspelled word using built-in word corrector. 5. Tried to find program requirements but ended up clicking on a course instead. 6. Ended up finding the program requirement based on the “specialist” keyword, but the user already had prior knowledge about this terminology |

Based on the observations conducted, conclusions can be made regarding the tasks, IA, potential improvements, and user satisfaction. For instance, the purpose of the academic calendar is to scavenge for courses, and program requirements, which is also a reoccurring search trend on Reddit. So, the task selected for this observation was also related to program search, but also ensuring that the program is new to the user. The observations indicate that the current IA is disorganized and often leads to an information overload for new users, whereas current users already know how to navigate in the least number of steps. Not only is this IA system time consuming for the user, but it suggests inconsistencies when compared to the standard information organization systems. Additionally, any incorporation of human psychology IA and hierarchical structure is not evident, and this is the greatest pain point. Consequently, a potential improvement for the redesigned interface includes changes to the IA and organization system and making impactful changes to the searching mechanisms. Based on observation, neither group of students were visibly frustrated with the navigation system, so the user satisfaction is good.

The secondary research is an analysis of the Reddit posts which indicate issues with navigation, accessibility, and overall usability. For instance, most of the reddit posts are from the student’s user group, and they highlight how there is a lack of informational accessibility, with highly inaccurate and constantly changing information which does not align with other university resources. As outlined in *Appendix A*, students face issues regarding misleading navigation, where they try to access pages, but are deceived as the page does not exist. This suggests that higher levels of navigation have page names that are not available. According to the course code, it is logical to assume that the student in question is a current student, and this suggests that novice users may face greater confusion if encountered with the same situation. Additionally, as outlined in *Appendix B*, it seems that aspiring students who are unaware of the academic calendar service are unsure of how they can search for program requirements. This can be a SEO issue or a lack of transparency regarding the services that the academic calendar offers on the main page, with the latter being more likely of the two.

Summary of Findings and Informing IA Strategy

The analysis conducted in the previous sections provides valuable insights into the current state of the University of Toronto Mississauga (UTM) academic calendar interface — focusing on context, content, and users. These findings will serve as a foundation for establishing an IA strategy and hence guiding the redesign process.

Context Analysis

The primary goal of the project is to improve the IA, resolve navigational issues, and implement HCI elements to enhance user experience. The identified stakeholders include website maintenance teams, user groups, faculty members, school council members, and administration. The intended audience comprises students, staff, parents, and external institutions seeking information related to program/course selection, degree planning, and other degree-related aids. To manage the content, the academic calendar is updated annually to reflect program and degree requirements accurately.

Content Analysis

The analysis of pros and cons of the interface revealed the ineffective search functionality, a lack of error handling, and minimal media elements present, which all contribute to navigational complications/issues. Additionally, the content audit highlighted an information overload, with limited media sources, and inconsistencies in navigation options.

User Analysis

The primary users are students, staff, parents, and external institutions, each with specific needs and frequency of use — the greater the frequency, the greater accommodation they need. Additionally, observations and secondary research indicated issues with navigation, accessibility, and overall usability, particularly for novice users who have not used the interface previously.

Implications for IA Redesign

|  |  |
| --- | --- |
| Focus on Information Architecture | The redesign will prioritize restructuring the IA to improve organization, streamline navigation, and reduce information overload. This includes re-evaluating global and local navigation options to align with user needs and expectations. |
| Enhance Search Functionality | The redesign will implement robust search capabilities with error handling, and intuitive suggestions will facilitate easier access to relevant information for all user groups. |
| Incorporate Media Elements | Incorporating multimedia content such as images, videos, and tables will enhance engagement and comprehension of the academic calendar's content. |
| Address User Needs | Modifying the interface to meet the specific needs of each user group, including students, staff, parents, and external institutions, will improve usability and satisfaction. |
| Improve User Guidance | Providing clear instructions and guidance on how to navigate the interface, especially for novice users, will reduce confusion and enhance user experience. |

Next Steps

Based on the findings, a comprehensive IA strategy will be created, outlining specific actions and timelines for redesigning the academic calendar interface. An iterative usability testing will be conducted to gather feedback from representative users and validate the effectiveness of the redesigned IA. The redesign process will involve implementing changes based on the IA strategy, incorporating user feedback, and ensuring seamless integration with existing systems.

Additionally, continuous monitoring and evaluation of the redesigned interface will be conducted to identify any further usability issues or areas for improvement, mimicking an iterative design process.

In conclusion, the findings from the above sections provide valuable insights into the current challenges and opportunities for improving the UTM academic calendar interface. By implementing these findings to inform our IA strategy, we aim to create a more user-centric, intuitive, and engaging interface that meets the diverse needs of its users.

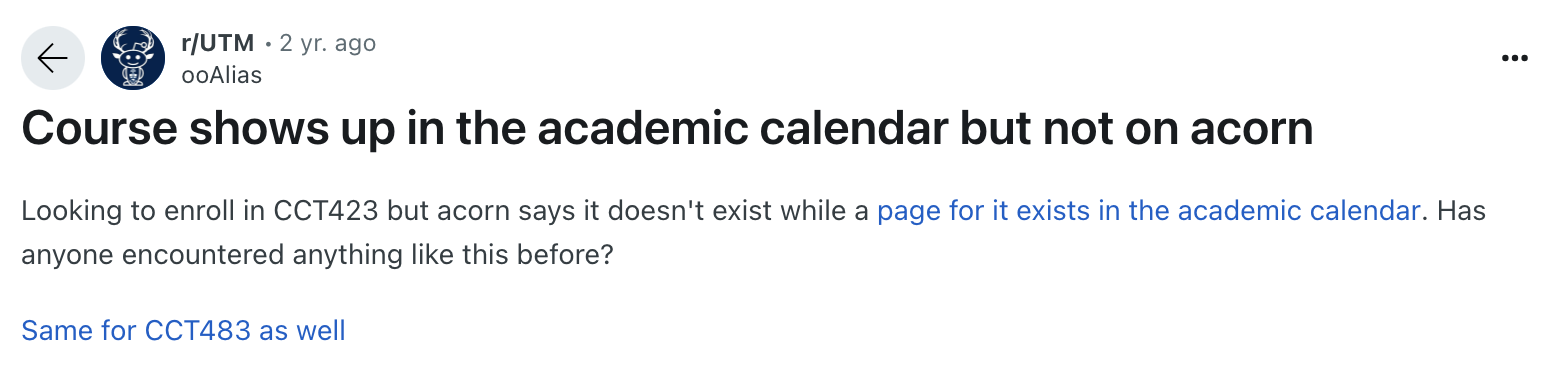
References

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Appendix A



Appendix B

A screenshot of a program

Description automatically generated

Appendix C

A screenshot of a website

Description automatically generated

Appendix D

A screenshot of a computer

Description automatically generated

Appendix E

A screenshot of a computer

Description automatically generated

Appendix F

A calendar with a building and text

Description automatically generated with medium confidence

Appendix G

A screenshot of a calendar

Description automatically generated