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Instructor: Rong Tang

Usability Study of Skilltype for Library Managers

by

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Executive Summary

The purpose of this study was to assess the performance of an emerging online library talent management platform, Skilltype, with one of its target demographics: manager-level staff at libraries and archival institutions. In order to determine how well Skilltype currently meets the needs of these individuals, our team designed a targeted usability test aimed at individuals with leadership experience in libraries who have not used Skilltype before. The Skilltype product development team wished to gain an understanding of how users would interact with their product, and uncover any usability problems that might negatively impact the user's experience with the new tool.

Recruitment for test participants took place over email. Participants were screened for library management experience and an interest in the product. Testing was conducted using a web based application for remote usability testing called Lookback. The Skilltype Staging server and Production server were used for testing the Skilltype website. Testing participants were given login information for premade accounts which enabled them to simulate the experience of using the platform as an institution manager who oversees teams of employees.

Our primary objective during the usability test was to measure the participants' perception of Skilltype's effectiveness, efficiency, and how well it satisfied their needs as a user. The test gathered both qualitative and quantitative feedback for our analysis. The study aimed to address the following questions: how do users navigate through Skilltype; which features do they find the most useful; how can navigation within the site be improved; and how satisfied with Skilltype are users in the site's target demographic?

In order to address these questions and gain a deeper understanding of the user experience on Skilltype, the study utilized remote synchronous usability testing, as well as a

heuristic evaluation to assess the site. Participants were asked to complete a series of tasks on the site using prefabricated accounts that had managerial control over other user accounts. Based on our conversations with Skilltype's product manager, the tasks were written to mimic what Skilltype developers imagine their customers would use the site for: browsing content, assessing their team's strengths and weaknesses, and assigning content for professional development to the members of their organization. Participants were surveyed before and after completing their tasks, which was one of the methods used to gauge how much their experience with Skilltype aligned with each participant's vision for an ideal talent management platform.

Study data revealed that Skilltype presents a number of usability problems that impact the user experience of the site. The feedback obtained through users' interactions with the site and their comments during and after the test provided excellent insight into how Skilltype can mitigate its usability problems and increase user satisfaction.

Introduction

Skilltype is a new talent management platform designed specifically for libraries. The platform offers both talent audits for institutions and learning opportunities for individuals. The extensive range of training creates personalized training plans for users. Its unique design and focus on the needs of libraries sets it apart from anything else on the market.

Given that this is a new platform, a usability study was conducted to better understand the needs of consumers and opportunities for growth. The site offers tools from both individual and organization management perspectives. This usability study looks specifically at the management specific capabilities.

After speaking with the Skilltype Site Supervisory, the team designed this study to address Skilltype's organization of team skills and identify challenges users face when searching for this data on the platform. The team focused the testing task on talent audit and team learning activities. Because the site hasn't had any previous usability testing, we also gathered feedback from test participants on general site navigation.

This study brought to light both strengths and opportunities for improvement on the Skilltype platform.

Product Description

Skilltype is a talent management platform developed for libraries and based out of New Orleans, Louisiana. Library-specific controlled vocabulary, tagging system, and dashboards based on analysis of library core competency frameworks are used to create personalized recommendations for users. The site provides a collection of resources curated from conferences, professional associations and industry experts.

The Skilltype website offers features and benefits for individual learners, as well as for library organization leaders and managers. Each user has a profile page that they land on once they log on to the Skilltype website. From the user's home page they can see recommended and upcoming training. The navigation at the top of the page offers a search bar and tabs for Home, My Learning, Profile, Browse, and Organization. For the purposes of this usability study, we will focus on the management features.

Skilltype offers a unique dashboard for institutions from a management perspective. The Admin Panel has tabs for Profile, Directory, Teams, and Insights. The Profile tab allows the user to see the organization's profile. Memberships and Strategic Directions are shown. There are tags

for Key Skills and Key Products that can be clicked. Management can use this section to select areas and skills it would like to track in the organization.

The Directory tab shows members in the organization and allows management to add members by sending an invitation. Each member of the organization is shown by name, affiliated team(s), role, and relation. The members' names can be clicked on to look at an individual's profiles.

Teams tab pulls all of the teams in the organization. The team name, managers, number of members, and edit/delete options are given. Each team name can be clicked on to pull up a page with a list of team members. From here you can see name, team role, job role, and date last active for all team members. There is also a new navigation bar that populates once you click on a team name. The tool bar defaults to Overview of teams. Lists, Skills, Product Experience, Interests, and Activity are also on the navigation bar.

The bottom tab on the Admin Panel is the Insights tab. The Insights tab offers users the ability to see what key skills and products the organization has acquired, which staff members are interested in learning, and what areas are missing from the team's talent pool. These skills and products can be clicked on to see who has those skills or interests. In addition, there are tabs at the top to look at lists of skills, product experience, and interests in lists that can be downloaded.

Test Objectives

- 1. To find out how users navigate the Skilltype website (how do they look for data).
- 2. To find out which features users think are most useful on the Skilltype website.

- To find out if users are able to find what they are looking for on the website or if navigation can be improved.
- 4. To find out how satisfied users are with their experience using the Skilltype website.
- 5. To find out if Skilltype is a website that users will return to for future use.

Review of Related Research

To better understand the context and outlook of the Skilltype usability test, our team conducted a thorough review of published research on related topics which have been summarized in the following section of this report.

1. Usability of Digital Libraries

An online library or platform is only useful if it is being used. There is no shortage of digital libraries (DLs) on the web today and the success of one platform over another comes down to whether users find the tools effective and efficient, leaving them satisfied and likely to return to the tool. In addition to general site maintenance, improvement, and justification, it is important to understand how users are engaging with the site and the impact of service (Chowdhury et al., 2006). This helps developers plan for the future and ensure the services most used are kept up to date.

1.1 Evaluation Methods

The majority of the theoretical reviews in this body of literature look at different methods or frameworks for studying DLs. Jeng (2005) reviews methods used for usability studies in the past and notes the need for "usability testing benchmarks for comparison" (p. 52). She illustrates the point by pointing to two studies that report a 75% accuracy and success rate. One study

implied that 75% accuracy indicates a well implemented product while the other wondered if 75% is high or low. The lack of consistent measures for evaluating usability makes even literature reviews difficult to compare. Jeng's intention is to contribute a model for evaluation of the instruments measuring DL usability. Their findings suggest that there is a correlation between efficiency, effectiveness, and satisfaction.

1.1.2 User-Centered Evaluation

Each time a user attempts to use a DL for the first time they must learn how to use the system and determine if the DL is worth using and returning to again. Koohang & Ondracek posits that users' views and perceptions play a role in whether a DL is actually usable (2005). Heradio et al. examines several frameworks that seek to clarify the concept of usefulness. They go so far as to call for "usability criteria" to be reclassified as "usefulness criteria" in a Saracevic framework where they feel the author did not explain the criteria effectively enough (Heradio et al., 2012). Simply put, the authors suggest asking whether the digital library is something the user thinks is necessary and useful? If the answer to this question is no, the user will not be likely to continue using the site. If the answer is yes, we can utilize the users' opinions to create an ideal site.

Information needs to be presented in a consistent manner that allows users to learn the site navigation quickly. Several studies used both task completion as a measure of effectiveness and Likert scales for satisfaction (Chowdhury et al., 2006; Glowacka, 2021; Joo, 2010; Joo & Lee, 2011). Jeng notes that both the design of the search results page and library metadata are critical for users to learn how to navigate the DL and understand available resources (2005).

In an effort to understand where users get lost or are disappointed, user body language and verbal responses are monitored during usability testing (Mara Ferreira & Nunes Pithan,

2005). In addition, most of the studies utilize Likert scales to examine satisfaction (Chowdhury et al., 2006; Glowacka, 2021; Heradio et al., 2012; Jeng, 2005; Joo, 2010; Joo & Lee, 2011; Koohang & Ondracek, 2005; Li & Liu, 2019;). Li & Liu's study asked about satisfaction using Likert scales between each task to ensure that the feelings were described accurately in the moment and the user did not forget how they were feeling if they were asked at the end of the tasks (2019). Koohang & Ondracek describe the "difference between achieved outcomes and a desired target" as gap analysis (2005, p. 415). By addressing these gaps either through changing the target or improving functionality, better usability can be achieved.

1.2 Design of Digital Libraries

When examining a DL from an information architecture perspective, one looks at how information is organized, how information is labeled or named, and how the navigation and/or search is set up within the DL. Good organization creates an intuitive DL, clear and consistent labeling increases user satisfaction, and ease of proper navigation ensures resources are easily accessible (Glowacka, 2021).

Personalization is another aspect to consider within DLs such as Skilltype. Chowdhury et al., points to several studies that recommend personalizing digital libraries to specific users to engage them in use and to manage their content (2006).

2. Usability of Tag-Based Systems

2.1 User-Defined Tag-Based Systems

The types of searches conducted by users of a DL or library online public access catalog (OPAC) will differ depending on the information needs of the user. The same is true for the users of Skilltype, where users are likely to use keyword searches to search for content by the content's

subject. Although Skilltype does not employ user-defined tags, applying the concept of faceted search to Skilltype could improve search functionality of resources within that system. Including the ability to conduct a search query for a keyword within a facet of tags represented in a user's institution's key skills could help users avoid the feeling of "information overload" that can occur with keyword-based searching.

Antelman et al. found in their usability study of a library catalog with the Endeca software that more than half of searches conducted during their tests were Keyword Anywhere searches, and more than half of the participants used facets to narrow their search results during the test. (Antelman et al., 2006) In a library setting, however, it is understood that many users will be interested in known-item searching. In Skilltype, the only option of search type is a Keyword Anywhere search, and this seems appropriate for user's needs in Skilltype. However, enabling users to narrow searches using facets beyond media type could aid access to more specific kinds of searches regardless of the limits (or lack thereof) imposed by a basic search functionality.

2.2 Folksonomies and Controlled Vocabularies

Many reports about tag-based systems focus on systems that employ folksonomies, or user-generated tags. Pirmann's research compares the usability of user-generated tags to authorized subject headings in a library's OPAC. In their tests, users utilized both user-generated tags and authorized subject headings to find resources in the library. Pirmann concluded that although user-generated tags can enhance finding materials in a library catalog, they cannot replace the functionality of authorized subject headings. The test participants indicated that they would use tags to search or browse the catalog if they had the choice, and felt that they could be a beneficial feature in the OPAC (Pirmann, 2012).

Skilltype uses a controlled vocabulary, and tags are apparently applied to resources by the system administrator. Incorporating a folksonomy that could operate locally within an organization on Skilltype could enable users to enhance their team member's experience using Skilltype, by creating tags that could be populated by resources relevant to specific teams or projects. This kind of tagging could not function in the same way as the tags in Skilltype's controlled vocabulary however, as those content tags must be able to be repeated sitewide and across user and organization profiles. Pirman's study provides a useful foundation to evaluate the usability of folksonomies in social, tag-based information systems like Skilltype, but more research and iterative testing would be needed to evaluate the usability of folksonomy tag-systems in these kinds of sites.

Tag browsing may only be narrowed by resource type; there is not an option to narrow or organize results in any other ways. Resource tags are displayed at the bottom of the webpage for each resource, but the type of tag/facet is not differentiated in any way. Although Skilltype does not allow for users to create tags and apply them to information resources in the application, its use of different factual tag types across the application could allow for clearer differentiation of tag types, more robust search capabilities using faceted tags. In the analysis of their usability test results, Sunuy recommended marking tags of a different facet, or type, to be marked in different colors in order to differentiate them. This is just one way Skilltype could differentiate between different kinds of tags, as well as between tags that the organization has added to its profile.

- 3. Remote Usability Testing Methodologies
- 3.1 Asynchronous Remote Testing

The literature that has been selected for this review includes a variety of studies on the efficacy of remote user experience (UX) tests, both synchronous (ie. designed to take place in "real time" with both the participating user and the host simultaneously engaged) and asynchronous (ie. the participant is unaccompanied as they complete the test's pre-designed tasks while the data from their test is automatically recorded for later analysis). Unfortunately, the COVID-19 pandemic forced many institutions to suddenly and drastically shift their usability testing operations to a remote model if not abandon their research indefinitely. The resulting innovations in usability testing methodologies cannot compare at all to the overwhelming losses suffered worldwide during the pandemic, but these innovations nevertheless opened avenues for research that were previously inaccessible or considered mediocre when compared to in-person and laboratory-based testing. The need for effective remote testing methods, however, was made undeniable during this period of time. As such, the methods that do currently exist are worthy of critical analysis for the sake of improving research practices with users outside of traditional settings.

3.2 Case Studies

Not all research teams had the option of choosing whether they would implement a synchronous test format. In fact, only three of the test methodologies described in the literature were synchronous; one was a unique hybrid model that allowed participants to request live assistance if they could not navigate the tasks on their own; and three were completely asynchronous tests.

Of the latter group, one test was held by a small research team working from different time zones. Their goal was to collect feedback on the design of an Open Educational Resource (OER) in the style of a LibGuide. This team used two free webtools to create the test:

ConceptCodify, which simulates the popular "card sorting" technique of gauging how users perceive information hierarchies, and an open source tool called Plainframe to create an interactive mockup of the LibGuide's navigation menu (Williams & Valla, 2014).

This team expressed regret over the limitations of asynchronous data collection, such as how the lack of observational data led to ambiguity about participants' thoughts and feelings about the test; this consequently made interpreting quantitative data difficult as well. Other points of frustration during the study included the research team's inability to assist participants when unexpected technology issues (often) interfered with tasks and the fact that some participants failed to complete any or all of the assigned tasks for various reasons (Williams & Valla, 2014). While these problems do not make a compelling case in favor of asynchronous UX testing, it is important to note that Williams and Valla conducted this study years before teleconference software like Zoom was in widespread public use. If this test were to be revised and attempted again, many of the aforementioned problems could be resolved through the use of emergent software and the simple fact that the participants (who were all educators or students) would most likely be much more familiar with OERs due to the pervasiveness of online college courses.

4. The Future of Talent Management

4.1 Current Talent Management

The greatest problems in the efficiency of talent management are when leaders view the organization and its individuals as entirely separate entities with separate goals. Presently, there is a great disconnect between organizational talent management and individual career development [Maggi, 2017]. In Avigdor's analysis of the talent management process he states

that "The underpinning assumptions of the practice of talent management are that organizations are systemic and linear, and that talent management must produce a single answer identifying what it means to be a 'talent' in any specific circumstance", it is in the disconnecting the assignment of the positions with the fluidity of personal development that minimizes the potential of a workforce [Avigdor, 2017]. A systemic revisiting can take place through the performance assessor intending to be simultaneously both involved and detached as opposed to viewing himself as simply an objective observer.

4.2 The Future of Talent Management

The future of talent management lies within co-creation and open discourse. As Avigdor states in their dissertation "true flexibility demands an ability to observe the situation, reflect upon it, and acknowledge one's influence in co-creating the situation while also being created by the interaction as it unfolds.", there is no one thing that leads to the maximization of organizational power [Avigdor, 2017]. Although some people may be born more inclined to more easily possess particular talents, talent itself is created, so what Avigdor emphasizes is that successful talent management is made up of both organizing and placing already existing talent as well as the further development of employee talent in accordance with personal goals. For this reason "talent management's traditional promise of future-oriented focus and reliable predictions is illusory, given that all participants are continuously merging their ongoing experiences to spontaneously co-create the future in unpredictable ways.", if the ideal talent organization of a corporation is constantly changing that indicates a successfully developing employee body [Avigdor, 2017].

The ideal future direction for addressing the needs of talent management is simply a basis of collaboration. Maggi in their career was accountable for developing career management

policies, processes and skills and in the research presented Maggi "found the collaborator and catalyst conversations were particularly relevant to the joint achievement of individual and organizational goals" as a method of addressing the disconnect between organizational talent management and individual career development [Maggi, 2017]. A lesser accepted role of an organization is its capacity to enable and encourage the development of its individual employees. Often people have more potential than they recognize themselves, which is where the role of the organization comes in through assisting in the identification and meeting of employees' needs in order to proactively manage their career. The key in this is to find a place in which organizational and individual needs intersect, that way efforts are equally motivated. In Maggie's dissertation she paints the problem in talent management and its solution well with the statement;

"Organizational talent management was largely conceived in terms of formal processes, whereas individual career development was largely described in terms of informal approaches with little reference to talent management. Thus, it seemed that, for most organizations, talent management and career development were operating in parallel with little crossover. However, both would seem to be inextricably linked. Individuals are the subject of talent management, and without their development, deployment and retention, the organization will not deliver its talent management aims." [Maggi, 2017]

Aside from the theoretical future of talent management, there is additionally a bright future for talent management in its utilization of emerging technology. One significant aspect to optimizing the management of talent is the identification and development of talent. Alexandra's paper on mobile and computer-based talent assessments discusses the usability of pre-employment online talent assessments as a method of determining what skills a candidate has and if the candidate is a good fit for a job [Alexandra, 2014]. This research is crucial because just as future driving AI is in talent management, simple assessment sites are and will be a driver in strategic talent organization. Tests that are not proctored and online raise concerns in how accurately they may assess one's skills, but as tools for talent assessment improve, Alexandra

assesses whether usability varies when it comes to computer run tests as opposed to mobile devices, as to not discriminate against those who may not have access to desktops. Resulting from this study, there were a few differences in usability ratings between methods, additionally the overall conclusion is that the usability of both computer and mobile tests are high. In further assessments on mental impact of online testing, subjects reported low levels of stress, physical workload, and high levels of perceived success [Alexandra, 2014].

The theory of talent management is strategically organizing the talent of a corporation in a manner that maximizes the ability of the organization, a crucial practice within every level of an organization. However the disconnect between organizational talent management and individual career development continues to hinder success as expansion further increases. The solution to this and the future of talent management is in a shift of the present data driven mindset. There is ease in leaning on data because it is straightforward and quantifiable, however when human error involves itself the decisions based on quantitative information is not always the most productive decision as it contains bias and confounding beliefs. This is where the future of talent management software comes in. What the corporate world needs is software that incorporates every angle of emerging technology, using online assessments to gather data on employees as well as performance trajectory data in order to map and model prediction, and with the grouping produced from this data future development can be guided with recommendations. At the end of the day the win-win and intersection point of goals for an organization is the place where employees are engaged by personal development and the organization is benefitting from an engaged employee all while gearing said employee to fill more significant roles over time and proper advanced talent management technology has the potential to do exactly that.

Method

Participants

A pool of participants was gathered by site supervisor and LIS 455 instructor. The criteria for participants is that they have library managerial/supervisory experience, the ability to commit to meet for an hour for testing during the designated testing period, and approval by the instructor. Recruitment took place over email. Participants were asked about their interest in the product and ability to meet for testing online. As an incentive for participation an Amazon gift card was offered upon completion. Five individuals were scheduled to participate. The first participant served as our pilot participant and the next four participants served as subjects one through four.

Scenario

Skilltype is designed to be used by all types of libraries. In anticipation of the NIH's Data Management and Sharing policy going into effect January 2023, our persona is an Associate Director for a health sciences library at a medium-sized research university. The Associate Director supervises 8 librarians and library staff across three departments and reports to the Library Director. In preparation for the NIH's new policy, the Associate Director needs to ensure that staff have the research data management skills needed to manage the changes. To do this, they will use Skiltype.

Tasks for the testing session center around managers finding out which employees have designated skills. The first tasks center around the participant exploring the Skilltype platform and giving general feedback. Next participants are asked to locate their team, add an individual to their team, and edit the team name. The next task asks participants to find which team

members have a particular skill using team insight and talent audit as well as through viewing individual profiles of team members. Participants then were tasked with using the tagging system to find content. They were asked to save resources and then look for where saved material is stored. The final task involves filtering search results, saving a training or content item, and sending the training to team members. All materials related to the script, persona, and tasks can be found in the appendix.

Surveys

Surveys were given before and after the testing session. Before the session participants were asked about their professional background and management experience. They were asked about their work with talent management tools and to envision their ideal talent management platform. Following the test, participants were asked about their satisfaction with Skilltype, ease of use, overall impressions and recommendations. Seven point Likert scales were used in both pre and post testing sessions. All testing instruments can be found in the appendix of this report.

Usability Sessions

All five usability tests were completed between October 24 and October 31, 2022. The team used Lookback, a user experience research platform which allows researchers to conduct remote usability sessions through video conferencing and participant screen sharing. Participants were scheduled two weeks in advance. Reminders were sent to participants the day before the testing session and a follow up reminder with Lookback link and Skilltype username and password was sent 15 minutes prior to the testing session. Once the participant logged on, the moderator introduced themself then completed the pre session, tasks, and post session.

Participants were introduced to and encouraged to use the think-aloud method throughout testing.

During the testing session, one team member moderated the session. One team member marked time on Lookback for each task and subtask. One team member observed visual data and another team member took notes on verbal data.

The pilot test was completed on the Skilltype Staging Server. During the pilot session, an issue with the server was noted. After reaching out to Skilltype about the error, the site supervisor had us move to the Skilltype Production Server for the remaining tests.

Measurements

The research was intended to measure the overall usability and user experience for managers using the Skilltype website. The usability testing gathered qualitative data about participants' experiences through think-aloud commentary and nonverbal behavior, as well as quantitative data about the duration and accuracy of tasks, in order to measure effectiveness, efficiency, and user satisfaction of the site. Effectiveness was measured by assessing the percentage of task completion among participants and through coding performance difficulties for each task. We set a three-level success distribution scale: fully complete (score of 1), partially complete (score of 0.5), and failure to complete (0.0). Efficiency was measured by assessing the time on task in seconds. Satisfaction was measured through post-session interview responses, as well as the participants' commentary and behavior while performing the tasks. Satisfaction rates were measured per participant as the average of their responses to the three satisfaction measurement questions in the post-session interview.

Lookback, a remote usability testing software, was used to collect time-based data during usability tests. In addition, visual and verbal data were collected using Google Workspace applications Sheets and Docs. Google Sheets was used to further process raw data and create tables and graphs for organizing the data following testing.

Data Processing and Analysis

Task time measurements were taken as usability tests were conducted, and the time stamped data were downloaded from Skilltype as CSV and Google Sheets files. Additional information regarding task completion, verbal data, and visual data were coded during and after testing sessions, with recordings of test sessions being reviewed to further populate data fields and note important moments and problems with task completion. Google Sheets was used to create tables and graphs representing the completion rate, efficiency of, and average duration of tasks, as well as satisfaction rates.

Heuristic Evaluation

A heuristic evaluation was performed by the research team following the completion of all testing sessions to identify usability problems with the navigation, dialogs, and interface of Skilltype. Task completion problems were identified through the heuristic evaluation, in addition to cognitive walkthroughs of Skilltype's pages. We used Nielsen's usability heuristic to conduct the evaluation, and a five-point scale to measure the severity of usability issues.

The Heuristic evaluation found problems associated with the following heuristics:

- Consistency and standards
- Recognition rather than recall

- Flexibility and efficiency of use
- Help and documentation

These usability problems guided our recommendations for improving the usability of Skilltype, and provided expert guidelines on key usability features to note for improvement within the study. Please see Appendix III to view the heuristic evaluation results.

Results

Demographic of Participants

We had a balanced set of participants with two female participants and three male participants. We ran our study with the assumption that every participant had some background in operating talent management sites as they all currently hold management positions at a variety of institutions and have been employed at their current institutions for at least 5 years and at most 30 years.

When asked about their previous experience with talent management sites, participants gave mixed responses, with some being unfamiliar with familiar sites including Linkedin and the Harvard Training Portal. Additionally, when asked how familiar participants were with using multimedia databases we received promising responses, ranging from 5 to 7 on a 7 point scale. Two of our participants manage talent within medical libraries, two within academic libraries, and one is a library outreach manager.

In order to gauge interest in exploring a new talent management platform, we asked our participants how eager they were to learn about new tools for professional development on a scale from 1-7. The majority of participants responded either 6 or 7, with one participant noting his interest in these tools was mainly for educating others, not himself. When asked how

frequently their institutions conducted staff reviews, all replied that they conducted annual reviews.

Participants described their ideal talent management software site as something that integrates smoothly into established workflows, allows for a variety of different kinds of content, and tracks changes over time. Three out of five participants expressed the importance of a tool's ability to integrate into their existing systems, and four out of five participants mentioned the use of such a tool as part of their annual staff reviews.

Satisfaction

The satisfaction results from our post-session questions indicated a variety of improvement points in Skilltype's usability. The overall satisfaction after interacting with the site was an average rating of 4.6 out of 7. The average rating of ease of use was 4.8 out of 7, and the average rating of likelihood to return to using Skilltype within their work was 3.2 out of 7. One explanation of this result is that participants were unable to entirely gather the scope of the site during the duration of the usability test, thus not being able to imagine how they could implement the tool into their management practice. Three out of five participants expressed the importance of a tool's integration into previously established workflows, and their understanding of Skilltype as a new standalone tool did not fit within their criteria for an ideal talent management site. Unfamiliarity with the Skilltype interface, in part due to it being a new software that participants were not used to using in their workplaces, was another contributor to participant dissatisfaction with the site. Additionally, some participants felt that the use of the site was not intuitive, and that tasks were excessively manual. More general clarity on the purpose of

the site and how to use it may have yielded higher satisfaction ratings; however, it seemed that the site did not necessarily fit into the participants' mental model for such a site.

Figure 1: Satisfaction Results

	p0	p1	p2	р3	p4
Overall satisfaction	4	7	2	5	5
Site's ease of use	4	6	3	5	6
Likelihood to return to site	2	7	1	1	5
Satisfaction rate	3.33	6.33	2	3.67	5.33

^{**}This table shows a variety of satisfaction metrics and how each participant verbally expressed their experience from 1-7, the last row is the overall satisfaction rates shared, every rating in this row greater than five is highlighted green and any rating below five is highlighted red

Quantitative Performance Results

User performance was measured based on the duration and success of task completion. A 70% benchmark was used to determine overall task success. 2 out of 5 tasks were completed successfully, with average time on task distributed varyingly across tasks. Task 2 was the only task completed 100% successfully by all participants, and the time spent on this task was lower on average than all other tasks.

Figure 2: Task Success Rates

Task	P0	P1	P2	P3	P4	Avg Success Rate
2	83%	100%	100%	100%	100%	97%

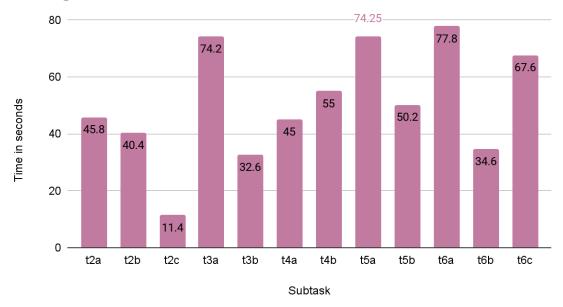
3	50%	50%	50%	100%	75%	65%
4	100%	50%	25%	100%	0%	55%
5	100%	25%	100%	100%	100%	85%
6	0%	33%	67%	100%	67%	53%

^{**}This table reflects participants' effectiveness across tasks, in collecting this data any incomplete task was coded as a 0, any complete task was coded as a 1, and any task that required assistance or was half completed was coded as a 0.5/ The percentage of correctness that appears for each task in this table is an accumulation of correctness for each subtask. The final column of this table shows average effectiveness, averages above 70% are highlighted green, while any other average is highlighted red.

Comparing the efficiency of tasks revealed a largely varied distribution among test participants, with time spent on a task and its success rate, with the exception of Task 2, which had the highest rate of success, and the lowest average time spent among its subtasks.

Figure 3: Average Time on Subtask

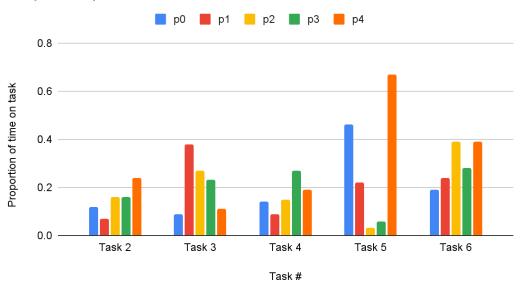
Average time on subtask



**This figure shows the time that participants took to complete each subtask on average, regardless of correctness. As seen, there was not a significant amount of variability between subtasks in terms of average time in seconds taken to complete.

Figure 4: Proportion of Total task Time per Task





**Each bar in this figure represents the proportion of total test time that each task consumed, grouped by task and color coded by participant. For the most part, across participants, each task took up a similar proportion of total test time.

Qualitative

Verbal commentary from participants provided valuable insights regarding usability problems the participants faced and their thoughts about different areas of Skilltype's functionality and layout.

The site navigation and layout was confusing to some participants, and they felt as though the site lacked context and information explaining what it does and how it works. This issue was noticed early on by participants, who felt that the homepage did not clarify what it was that they were looking at. Additionally, some felt that the labels of certain buttons were not descriptive enough of their functions, such as that for "Organizations" and "Browse".

A selection of comments can be found in Appendix II.

Interpretation

Participants did not have major problems completing the tasks involving the Teams page, although some were confused about the organization of content on this page. It is possible that using generic data in our testing was confusing to the participants, because they were not sure what they were looking at on the teams page, since it was unfamiliar to them. Participants who did not take the time to click through all of the pages at the top-level navigation bar had difficulties completing tasks later on, and this speaks to the lack of context on the site homepage and lack of clarity in the page label organization. Additionally, participants did not explore all of the subpages within the Teams/Organization page, namely the Insights page, which would have helped them find information that they may have found helpful to the completion of tasks.

Lack of context and confusing web architecture was a problem within a number of pages on the Skilltype website, including the Teams, Organizations, and Browse pages. This caused participants to have difficulty completing tasks on these pages, and made it difficult for them to understand the purpose and functionality of those pages and their contents. Some buttons throughout the website are not clearly identified as clickable items, and went unnoticed by test participants. This includes the "See All" buttons in the Browse page, and the sort buttons on the row names in the "Organizations" > "Teams" page.

Profile pages for both individual Skilltype members and teams on Skilltype caused some confusion during testing. The location of a user's profile information is fixed on on the left side of the page across most of the site, except when on other profiles and organization pages, where the organization profile or other person's profile is shown in its place. This was disorientating to participants, and there is a need for greater consistency in accessing one's own personal profile, while also having its relationships between other users and organizational profiles visible.

Participants' mental models of Skilltype were revealed largely through qualitative data gathered during the pre-session interviews, test tasks, and post-session interviews.

During various points in usability tests, multiple participants mentioned using an external resource beyond Skilltype, such as a search engine or organizational chart to complete tasks.

Although Skilltype does provide simple access to the tools needed to complete user tasks, it is understandable that senior-level Library professionals would need more time, integration into workflows, and possibly a greater level of personalization, before they would feel comfortable implementing and using the software within their organization.

Recommendations

Improve sitewide navigation and dialogs

Usability problems associated with a lack of clarity and understanding of Skilltype's layout and navigation functionalities contributed majorly to the low success rate of test tasks. Improving navigation across the site would help users feel more oriented within subpages, and better understand how site dialogs work across pages. This can be done by increasing the visibility of page hierarchies and relationships, as well as the relationships between content items within the site. Adding breadcrumbs, subpage-level navigation in sidebars, and increasing visibility of dialogs and buttons will make it easier for users to understand how they can interact with the site, and make the functions more intuitive to use.

Creating more dynamic elements that appear when users hover over or click on them could solve a number of usability issues in Skilltype. Test participants mentioned that it would be helpful to see a description of a content item within search results without having to click into a new page; adding a small screen that appears showing more information about content items when the user hovers over the item, or clicks a preview button, could make navigation among and selection of content easier. Brief descriptions that appear when the user hovers over different pages or functions could reduce user confusion about the functionality of certain pages, like "Browse", "Insights", and "Organizations". This could also be a way of integrating help documentation across the site, and providing guidance for users who may not understand how to use the site's tools.

Improve search functionalities

The search functionality of Skilltype at the time of the usability testing seemed to be very basic, allowing only keyword searches and unfiltered results. Participants expressed that an advanced search function would be useful, and it was apparent that the main search bar was their go-to for looking for things on Skilltype. As library professionals with expertise in performing search queries of online multimedia databases, our participants expected Skilltype's search to function similarly, and were not impressed upon realizing they could only perform a keyword search of the content within the site. Adding the ability to perform faceted searches, reorder search results, and include other kinds of searchable items (tags, organizations, and organization members) in search results would improve the user's ability to engage more effectively with the various kinds of content within the site.

As an additional point to the search functionality of Skilltype, a lot of confusion in our tests arose from the difficulty to differentiate between the pages that appear for tagged topics and the browse items that appear when those tags are searched. To create some consistency we suggest having an option to search tags that take you to their topic pages within the primary search function of Skilltype.

Improve "Organizations" page and functions

The "Organizations" page in Skilltype has some powerful features, and requires clear visuals and wording in order to ensure users can utilize the features to their full potential.

Overall, what this aspect of the site needs is consolidation and renaming of labels to increase clarity and understanding of the page functions. It could be beneficial to have a drop down menu from the organizations tab from which users can select their organization, which leads to an overall talent directory view which can be filtered by team, and featuring a sidebar navigation

from which other pages within the tab can be selected as options. Extending this, upon clicking a particular team a "Talent Audit" should appear as a consolidation of the current "Admin Panel". Throughout this process, the profile icon in the top left corner should remain consistent, meaning that even when a team member is selected when searching for a more in depth description of their skill set, their profile should not replace the user's profile on the screen.

Additional recommendations can be seen in Appendix III: Wireframes

Conclusion

This usability study focused on the management functionalities of Skilltype. The findings gathered can be used to prioritize platform improvement efforts. The study recommends focusing on site navigation and dialogue, search functionality, and changes to the "Organizations" page. All findings including the surveys, wireframing, and other data will be provided to the site supervisor. We believe implementing the recommendations above will make Skilltype more efficient, effective, and satisfying for institutions using the site. There are areas of the site we did not get to investigate. For this reason, we recommend further research and another usability study following platform updates in order to gain a better understanding of how to meet the needs of all of Skilltype users.

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Appendix I: Usability Study Instrument

A. Interview and Test Script

Pre-Session Interview Questions

Thank you very much for your willingness to participate in our usability study today. In the next 10 minutes, I will ask you questions about your background and experience using talent management tools.

1. What is your professional background? Can you briefly tell us about your leadership experience in managing library staff?

(short answer)

2. What is your current professional title?

(short answer)

3. How long have you been with your current institution? How long in your current position?

(short answer)

- Has your current team transitioned to fully- or partially-remote work since 2019?
 YES/NO
- 5. On a scale of 1 to 7, how interested are you in learning about new tools for professional development?
- 6. Have you ever used a talent development website before?

YES/NO/UNSURE

o If "YES"

- i. What is the name of the tool/website?
- ii. Approximately how long ago did you use it?
- iii. Were you a frequent user of this site?
- o If "NO"
 - i. By what other means has your institution managed employee talent development?
- 7. On a scale of 1 to 7, with 7 being the most familiar, how familiar are you with using multimedia databases?
 (scale)
- 8. What three skills are the most useful for staff to have at your institution? (list)
- 9. If we ask you to envision an ideal tool/platform that helps you to manage the talents and skill sets among your library staff, what are the key characteristics, features and functionality of such a tool? (short answer)
- 10. How often does your institution conduct staff reviews?(short answer)
- 11. How do you currently stay informed about news and literature from your professional field(s)?
 - Scholarly journals
 - E-mail or print newsletters
 - Professional networking websites
 - Other (please specify)
 - o N/A

Usability Test Scenario

Introduction:

Imagine that you are the Associate Director of the health sciences library of a medium-sized research university. You are the direct supervisor of 8 librarians and library staff across 3 departments, and you report to the Library Director. The librarians on your staff assist student and faculty researchers in utilizing library resources, as well as in preparing and managing their research materials. In anticipation of the implementation of the NIH's Data Management and Sharing Policy in January 2023, you are trying to make sure each member of your staff is trained and confident in research data management skills. You have decided to use the website Skilltype in order to better document and manage the skills of your staff.

Please note that there are no right or wrong answers, and we are only interested in understanding how you would use the Skilltype site for tasks similar to those outlined in this test. We are not testing your knowledge or skills in using the site, but rather the usability of the site itself. Please use the Skilltype website in your browser to complete the following tasks in support of your staff training goals. As you navigate the Skilltype site and complete these tasks, please remember to voice your thoughts aloud for the duration of the tasks so that we have a better sense of what you are thinking.

Tasks:

- 1. Since you are new to Skilltype, you decide to take some time to explore the website. Navigate around the homepage, and then find your profile.
 - a. What is this website for?
 - b. What are your impressions about the functionality and layout of this website?
 - c. Can you see this website being used in your professional work? In what ways?

- 2. You are using Skilltype to manage the training of your staff. You recently onboarded a new librarian, and you would like to add them to the Digital Services team.
 - a. Where would you go to find information about the teams of staff in your library?
 - b. How would you add a new member to your team?
 - c. How would you change the title of your team to "Super Skilled Library Team"?
- 3. You know that a few of your staff have experience in research data management and other data skills. You want to use Skilltype to find out more about the data skills of your team members.
 - a. How would you find out which team members are skilled in research data management?
 - b. How could you find out what other skills and interests a member of your team has?
- 4. The new Systems Librarian mentioned their familiarity with a tool called Tableau in their interview. You are interested in finding out more about Tableau so that you can become more well-versed in this tool.
 - a. Where would you go to find out what Tableau is?
 - b. Since you are still learning about this tool, you want to be able to access these resources the next time you use Skilltype. How would you save this topic so that you can browse it in the future?
- 5. Select a resource about Tableau that looks useful. Imagine that you just finished reading/watching/listening to its content. You want to keep a list of the helpful resources you have used so that you can share them with your team later. How would you do this?
 - a. Where would you go to find that list next time?

- 6. You want to collect some useful video training resources that could help the rest of your team build their skills in research data management.
 - a. Can you find some videos about data management that would be useful for your team?
 - b. How would you use Skilltype to gather the resources you found in one place?
 - c. How would you send one of these videos to a member of your team who does not have experience in the skills it covers?
- 7. You want to identify an online learning program or course that is accessible online. Find two examples of such a program using Skilltype.
 - a. What are they called?
 - b. How do you get information about them?
 - c. Would you recommend these courses to your staff? Why or why not?

Post-Session Interview/Survey Script

Thank you for your participation in this study. We are very interested in learning about your experience using Skilltype today. In the next 10 minutes, I will ask a series of questions about your overall impression and thoughts of Skilltype.

1. On a scale of 1-7 with 7 being very satisfied, how satisfied are you with using the Skilltype website?

2.	On a scale of 1-7 with 7 being very easy, how easy was it to use and navigate the
	Skilltype website today?
3.	What is your impression of the navigation and layout of Skilltype?
4.	Were there any content features that surprised or stood out to you while using the
	Skilltype platform?
5.	Were there any features that were especially easy to use? If so, which ones?
5.	Were there any features that were confusing or need improvement? If so, which ones?
7.	Were there any features that Skilltype does not currently have that you think would be useful to add?
3.	Recall the ideal talent management tool that you envisioned earlier, how do you think Skilltype compares?
9.	On a scale from 1-7 with 7 being very likely, how likely are you to recommend Skilltype
	to your friends or colleagues?
10.	On a scale from 1-7 with 7 being very likely, how likely are you to return to Skilltype again?

11. Do you have any additional thoughts, comments of	or questions you wish to share?
--	---------------------------------

Thank you very much for your participation!

Appendix II: Selected Comments from Participants

Navigation/Layout

"I don't know that I always need to see my profile information, if i'm not in my profile; there's better uses for the page, or if there was a breadcrumb, so I could see all the teams that i am a part of to navigate between them to add content to them."--P0

Homepage

"On the homepage, it looks like there is documentation on different subject matters. I wouldn't know if this is something that could help my staff get educated on things. I would think there would be some sort of mission statement on the homepage, there isn't anything here that explains that."--P0

"You don't really know what you're going to see when you click on any one of those little links on the [...] page."-- P2

Teams/Organization Pages

"Top menu seems to be specific to my profile, not the team's profile, and I don't know, differentiating between whether you're in your profile or your team's profile. I'm not looking for skills for me, I'm looking for skills for my teams."--P0

Finding content/Search Bar

"The search box is ok, the filters would be much more helpful after i do a search. These filters should show up more regularly every time you get a list of information. All of my employees aren't going to learn the same way. So being able to pull out certain types would be helpful."- P0

"It seems pretty straightforward, when I browse and click on archives and show 100 something items, who curated that list, is skilltype running and algorithm on youtube?"- P4

"A more sophisticated search interface that allowed more limiters on search type, more info on how content is indexed, where they're pulling it from, what the scope is, and annotations to explain what you are looking at."- P3, in response to the question "What features not currently in Skilltype would be useful to add?"

Tags and Topics

"If these are actually premade tags like how Dewey uses, that's good in some ways, people have a hard time normalizing tags across departments but you...always want the ability where you can go in and make your own tags too... maybe it needs more granularity. Hopefully that's a feature."-- P1

Appendix III: Heuristic Evaluation and Wireframe Recommendations

Heuristic Evaluation Worksheet

Usability Heuristic Used: Nielsen Severity Levels: 5pt

	Heuristics	Conformance Question	Problems Identified	Severity
1	1 Visibility of System Status	Are users kept informed about system progress with appropriate feedback within reasonable time?	None	0
2	Match between system and the real world	Does the system use concepts and language familiar to the user rather than system-oriented terms? Does the system use real-world conventions and display information in a natural and logical order?	Menu lists don't use recognizable terms and are not structured in an intuitive way. "Copy to Clipboard" feature is unclear.	1.5
3	User control and freedom	Can users do what they want when they want?	None	0
4	Consistency and Standards	Do design elements such as objects and actions have the same meaning or effect in different situations?	Clicking on an element in the Browse page has a different effect than clicking a button for the same element on the Teams page.	1
5	Error prevention	Can users make errors which good designs would prevent?	None	0
6	Recognition rather than recall	Are design elements such as objects, actions and options visible? Is the user forced to remember information from one	Recognition is very low due to poor use of visual organization. Headers with different functions look the same, buttons/hyperlinks	2

		part of a system to another?	look the same as un-clickable items. "Copy to Clipboard" feature is extremely unclear.	
7	Flexibility and efficiency of use	Are task methods efficient and can users customize frequent actions or use short cuts?	Low flexibility with filtering search results. Too many clicks needed for simple tasks. Poor utilization of screen space.	3
8	Aesthetic and minimalist design	Do dialogues contain irrelevant or rarely needed information?	Some information is unnecessary, but lack of info/dialogues is a more persistent issue.	1
9	Help users recognize, diagnose and recover from errors	Are error messages expressed in plain language (no codes)? Do they accurately describe the problem and suggest a solution?	None	0
10	Help and documentation	Is appropriate help information supplied, and is this information easy to search and focused on the user's tasks?	No explanation blurbs, descriptions of features, or help/info buttons readily available to guide users through the site's features. Pages lack context.	4

Wireframe Recommendations 1-6



Fig. 1 Organizations Profile Page

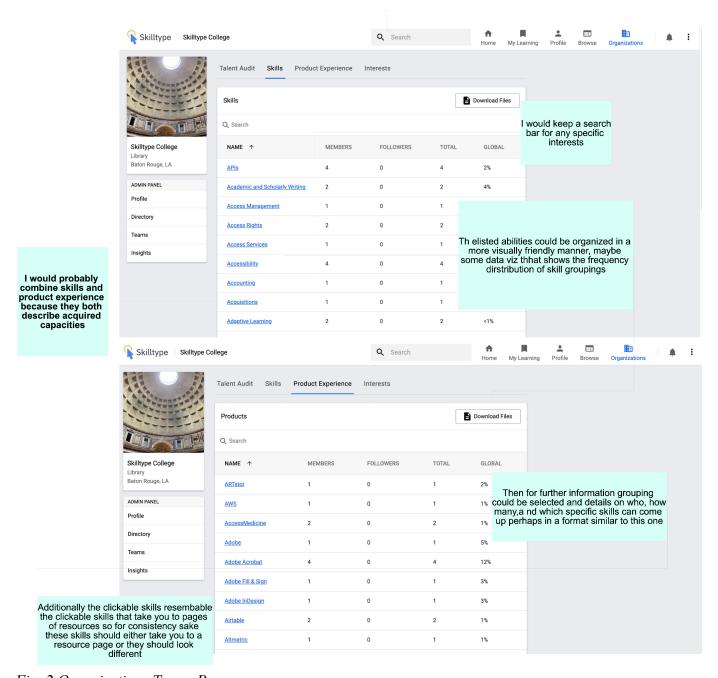


Fig. 2 Organizations Teams Page

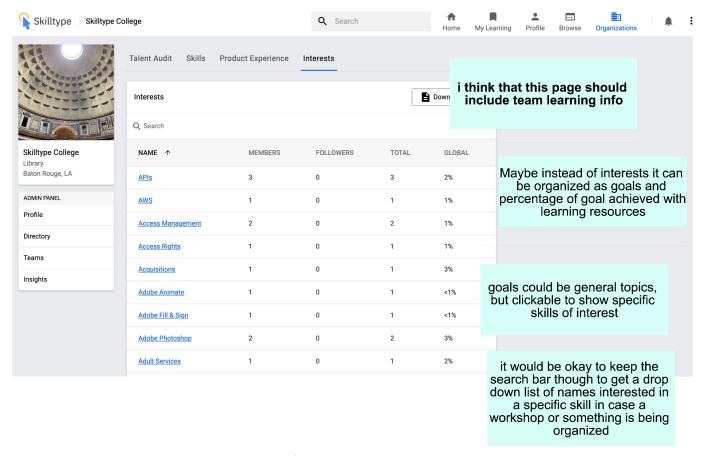


Fig. 3 Organizations Teams Page, continued

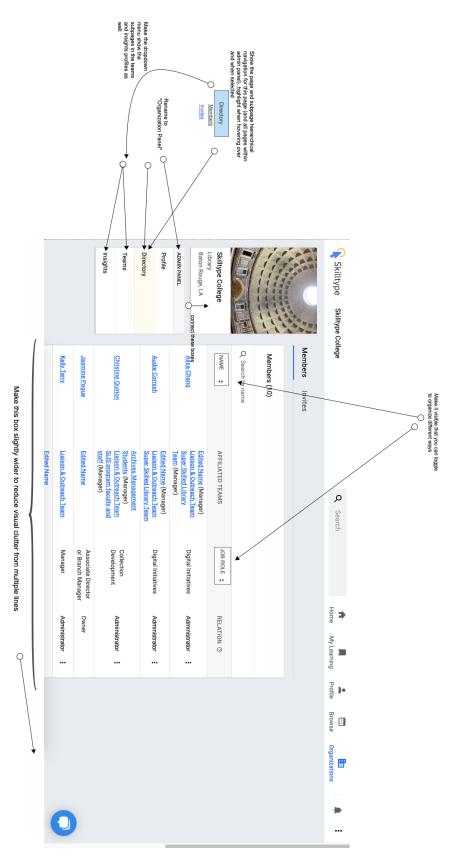


Fig. 4 Organization Directory Page

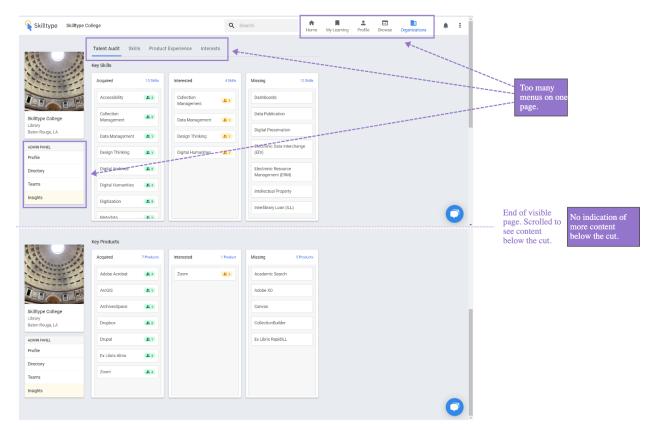


Fig. 5 Organization Insights Page

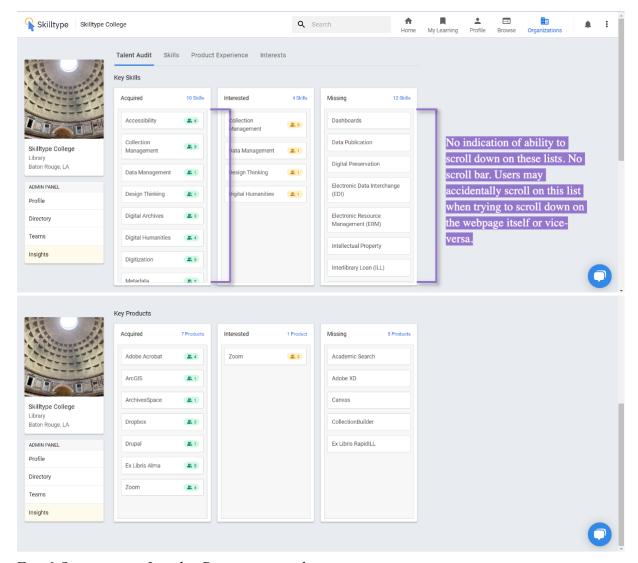


Fig. 6 Organization Insights Page, continued