
Making an iMpact: Redesigning a Business School Web Site around Performance Metrics

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Abstract

The University of Michigan Business School went through a substantial redesign in 2002-2003 of their site of over 3000 pages, with a focus on increased ease of use, clean, professional design, improved branding, reduction of web sprawl, and integration of their public site with their intranet, called "iMpact". The site serves a range of users with varying needs, including faculty, students, staff, alumni, prospective students, media, and recruiters.

Our redesign process was grounded in a metrics-based user testing approach that set targets for various measurements such as task completion rate and compared these to users' performance on their previous site and the sites of their competitors. Task completion rate, for instance, went from 61.7% on their former site to 92.5% on the final redesigned site. Continuous testing provided detailed feedback, and measurement enabled us to reduce project risks while demonstrating substantial improvements versus competitors' web sites.

Keywords

Brand Building, Experience Strategy, Graphic Design, Information Architecture, Interaction Design, Intranet Design, Multidisciplinary Design / Interdisciplinary

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Design, Performance Metrics, User Experience, User Interface Design, User Research, User-Centered Design / Human-Centered Design, Visual Design, Web Site Design.

Industry/category

Education, Universities, Business Schools

Project statement

The University of Michigan Business School was in the midst of a major effort to brand itself as one of the top business schools in the country. As part of this initiative, they needed to redesign their web site to reflect their new image. The School wanted the new site to not only be visually attractive and functional, but also to offer simple and successful user experiences.

The Business School identified three major goals for the project:

- 1) Leverage existing content and resources by developing coherent and effective presentation and navigation. Part of this includes integrating the School's public site and intranet.
- 2) Use the internet for marketing and relationship building. Attract prospective MBA students and corporate opinion leaders by improving the School's image.
- 3) Convey a consistent web presence that builds the School's institutional identity and brand.

To meet these goals, we worked closely with the Business School, establishing criteria consisting of visual design standards, functionality requirements and usability metrics to measure our success.

The following case study outlines the University of Michigan Business School project focusing on how we

integrated the School's public site and intranet (called "iImpact") within their larger web site goals. We also address usability goals, our approach and overall results.

Project participants

The project was a collaborative effort between Diamond Bullet Design and the University of Michigan Business School. Diamond Bullet led the design, information architecture, and development of the site, but numerous units within the school provided substantial support for the effort.

Diamond Bullet Team:

Mike Monan—Project Manager

Tom Brinck—Lead Usability

Seunghee Ha—User Testing

Kara Lock—Information Architecture

Alfred Speredelozzi—Usability Engineer

Nick Pritula—Lead Visual Design

Katrina Brehob—Lead Engineer

Mindi Chamberlain—Software Engineer

Ben Guidinger—Software Engineer

Project dates and duration

Diamond Bullet Design began the project on May 1, 2002 and the School launched the site in March, 2003. The project spanned 10 months and took over 8000 hours or 200 person weeks to complete.

Approach

The University of Michigan Business School project was massive, entailing reorganizing a web site with over 3,000 pages and 100 ASP based web applications, as well as integrating a public site with an intranet optimized to specific user constituents. Our specific

scope was to produce a new visual design and navigation to improve the image and ease of use of the site. We were not involved in redesigning interactive applications or rewriting content, which may be considered in future rounds of design. To accomplish this strategically, cost-effectively and successfully, we applied a user-centered design process grounded in a metrics-based user testing plan, aiming to continuously evaluate the quality of our proposed designs as we progressed.

We immediately established baselines and set targeted usability metrics to use as criteria for success. These measurements helped us gauge progress toward the project goals throughout the design process. Continuous evaluation also diminished risks, both for our clients and us, ensuring we eliminated design flaws early and delivered a product on time and within budget that demonstrably outperformed the previous site and their main competitors.

Process

The University of Michigan Business School web site was designed and developed in phases including: strategy and user needs analysis, conceptual design, prototyping, production, and deployment. We applied our pervasive usability approach [2], which entails keeping usability in mind at each of these phases.

The Business School had originally begun the project a year earlier and one of the reasons the project had stalled was that the usability goals of the project had not been effectively executed and measured.

This history both empowered us to put usability at the forefront of the project but also placed on us an

enormous responsibility to ensure that a commitment to usability would result in a more appealing, better functioning, and ultimately a more pleasing web site to use. Part of the plan that we agreed to with the Business School was meeting usability target metrics.

Strategy and User Needs Analysis

- Web site goals established by client project leaders
- User needs gathering from the Business School
- Competitive Analysis
- Focus Group

The first step to this project was establishing a common understanding of the web site goals and requirements. A preliminary requirements analysis phase had been completed by another firm that had, through user and stakeholder interviews and competitive analysis, defined goals for the site and important user tasks.

With the goals of the School in mind, we reviewed the sites of other top business schools for school image, functionality, and task performance. While we were able to assess their public sites thoroughly, we did not have access to their intranets, so we were not able to evaluate their solutions to similar intranet issues.

We also met with the business units of the School and conducted a focus group of Business School staff to understand their current processes and future needs.

The constituent groups were determined to consist of prospective students, current students, faculty and staff, recruiters and corporate sponsors, alumni, and media. Some of these groups could overlap, individuals could fit into multiple groups, and some of the users

would need access to only public information or both public and private information.

Conceptual Design

- Task Analysis
- User Scenarios
- Walkthroughs

We began the conceptual design phase by tackling the issue of integrating the public site and intranet. Each of the competitor schools we looked at had separated these sites, as had Michigan. However, Michigan expressed a desire to integrate these sites because valuable resources on the public site were either unknown to or not being accessed by intranet users.

Our approach to design was task driven. We identified important, frequent and complex tasks for each constituent group based on the user needs analysis. In addition we created detailed user scenarios to visualize the context in which the site would be used. These described brief stories of specific users' interactions with the site. We had anticipated that the scenarios would allow us to fill in gaps left by the task analysis, but because both documents were produced with the same source information, the scenarios did not prove as illuminating as we had hoped.

What proved to be the most valuable part of conceptual design was conducting walkthrough sessions with a multidisciplinary group of graphic designers, usability experts, and software engineers to brainstorm ideas for integrating the public and private Business School sites. In these sessions we put on the table interface and interaction approaches and debated the merits and drawbacks of each from the perspective of design, usability, and functionality.

Prototyping

- Card Sorting
- Diagnostic User Testing
- Wireframes

Prototyping and user testing proved to be the most effective methods for producing and improving the information architecture and user interface design. We began this phase by gathering card sorting data from users. In card sorting, we wrote the names of pages at the top 2 or 3 levels of an initial proposed architecture onto separate cards. Our own designers and target users then went through the exercise of sorting those cards into groups and labeling the groups. Based on the card sorting results, we made adjustments to the page names and categorization and built interactive wireframes—skeletal html prototypes of the site—to test the architecture (Figure 1).

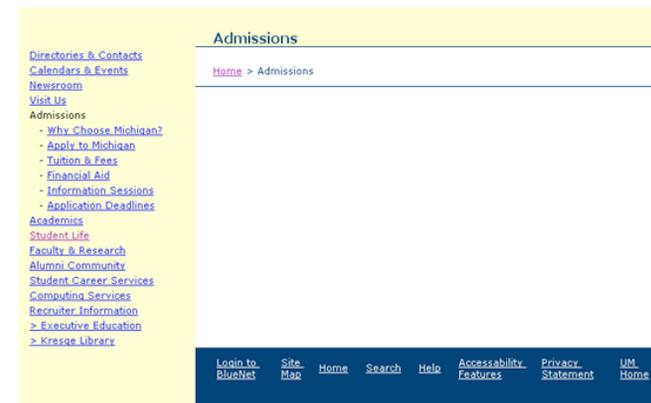


Figure 1. An early interactive wireframe produced by the rapid prototyping system. The same system enabled us to progressively refine the design and evolve our prototypes to the final design.

We were fortunate to be able to conduct user testing on a large scale. Our general user testing approach was a series of tests with concrete measurements of progress that built upon an approach we'd used to develop an e-government portal [3]. In the course of the project, we tested over 180 people in the identified target audiences. The overall plan consisted of measuring:

- Baseline data for the existing site
- Baseline data for competitor sites
- Two "interim" tests that carefully measured our performance so far
- A series of "diagnostic" tests that were less formal and tested some different tasks than the baseline but gathered suggestive measurements we could judge progress by even if we they weren't exactly comparable
- A final test completed just before launch with enough time to make final polishes to the site.

At the outset, our usability plan included targets for usability metrics upon which we would measure the success of the project. These metrics covered:

- Task completion rate: the average success rate at completing attempted tasks
- Task time: the average time to complete a task (for successful attempts only)
- Subjective task ratings: user responses on a 1 to 7 Likert scale after completing each individual task, evaluating each task on items such as difficulty and perceived speed of the task
- Subjective overall ratings: user responses to the site as a whole, after completing all tasks, on items such as attractiveness and ease of use

Our metrics targets guided us by ensuring that we focused on user tasks, but the value of user testing did not end there. Some of the most valuable data we culled from user testing came from noting patterns in user errors, user response feedback, and post-test interviews.

RAPID PROTOTYPING TOOLS

Throughout the design process, we used a custom built rapid-prototyping tool to generate test sites for viewing changes and performing user tests. This tool enabled us to modify the information architecture, visual design and content independently from each other, and then quickly re-generate the site for further critique and user testing. This technology proved invaluable, enabling user testing to efficiently keep pace with the latest design updates and providing a concrete artifact for review by Business School units. Our test sites were continually refined to respond to our test results. And, because we could modify various aspects of our test sites independently, progress made in one area of design, such as visual design or information architecture, rarely became a bottleneck for the other efforts. This minimized delays in the software development schedule from user testing feedback.

Production

- User Testing
- Beta Site
- Expert Reviews

Usability work continued throughout the production phase of the project. Because of the project timeline, many phases of our usability plan occurred concurrently with site development.

The project was planned around 2 launch dates (beta release and final launch). The beta release came out in October 2002 and contained about half the content of the final site and an interim visual design. Feedback from users trying this beta site out was most instrumental at gauging their reaction to the visual design.

Deployment

- Quality Assurance
- User Testing

In a final deployment phase, we continued testing using automated tools, hand testing for quality assurance, and further user testing.

User Testing

Test participants were recruited with the assistance of the Business School from the 4 identified primary audiences: current students, prospective students, faculty, and alumni and recruiters. Every attempt was made to balance the sample users from each group, though difficulty recruiting prospective students meant they were under-sampled in the final test. Each of the tests was conducted with a minimum of 24 participants. Data from the "Diagnostic Test" actually represents combined data from several less formal tests with at least 4 participants in each test and a total of 32 participants.

The tasks used for testing were selected as important tasks that were critical to users and to the goals of the Business School. There were 5 core tasks that all user groups performed. An example was to find the contact information of a specific faculty member on the site. In

addition, each user group had 5 or more tasks that were specific to that group. For instance, the prospective students were asked to find application deadlines. Thus, more than 25 tasks were evaluated.

User testing was performed both in an on-site user testing lab at the Business School and at Diamond Bullet. Web sites were viewed on Windows PCs with Internet Explorer, the standard platform of the Business School. One primary evaluator ran each test, sometimes with an additional observer from the design team or the Business School project leaders. Times were taken with a stopwatch and observations were written down during the test. A standard think-aloud protocol was used, and questionnaires were given for participants to fill out after each task and at the end of the test session.

Our testing results are shown in Figures 2 – 5. The first column in each figure is the measurement of the previous site before redesign. Then 2 competitor sites are shown, following by our measurements in progressive tests. The goal we agreed upon with the client is that we would aim to be better than the competitors on all 4 of these measures, which we achieved.

In each round, we looked at the problems found in the previous rounds and made design changes to address them – this iterative refinement is reflected most in the task completion rate scores. The previous Business School site was worst among competitors except for task time. The new design is better than competitors and the current live site on all measures.

All scores in these graphs are averaged over the full set of users and the full set of benchmark tasks. The two subjective ratings graphs (Figures 4 and 5) represent averages over several subjective ratings on a questionnaire with Likert scales.

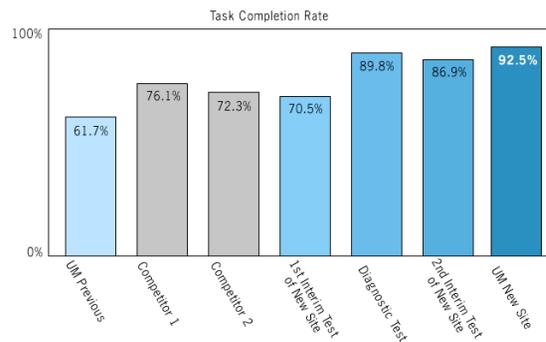


Figure 2. TASK COMPLETION RATE. The success rate at finding information.

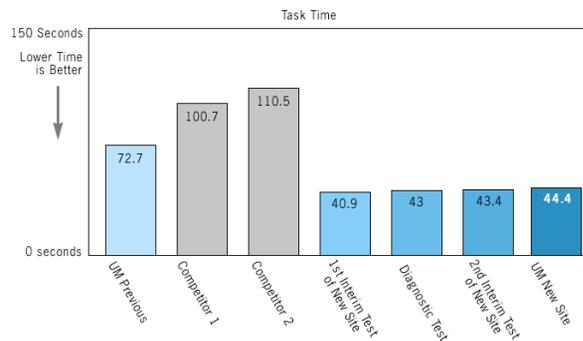


Figure 3. TASK TIME. The average time to successfully complete a task.

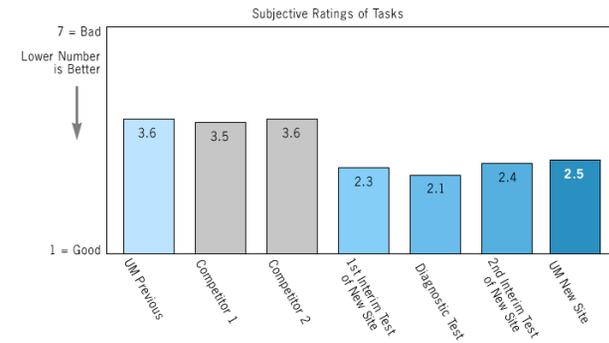


Figure 4. AVERAGE SUBJECTIVE RATINGS OF INDIVIDUAL TASKS (e.g. how easy was this task? 1=good, 7=bad)

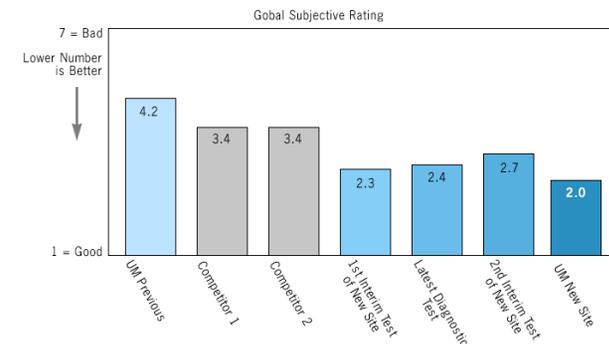


Figure 5. GLOBAL SUBJECTIVE RATING. (attractiveness, prestige, simplicity, and so forth). Interim 1 and Diagnostic tests do not include visual attributes in their scores because the visual design was not yet incorporated.

In interpreting these charts, note that interim and diagnostic tests were done on prototypes that weren't complete in every way. The 1st Interim test was done on a bare wireframe (Figure 1) without any specific visual design or any content. At this early stage, preliminary visual mockups were evaluated through

relatively informal interviews with users after the testing. The 2nd Interim test had a near-final visual design but still only minimal content. The Diagnostic tests were done on different tasks, so the data is not entirely comparable, though the fact that performance data in the Diagnostic tests is strong for tasks that weren't our baseline tasks is reassuring in that it suggests that our improvements to the site were broadly beneficial, not simply helpful to the tasks we were designing for.

Specifically, users completed the tasks on the original site 61.7% of the time and on the new site 92.5% of the time. While on the original site, the average time to complete tasks (excluding data on tasks that weren't completed successfully) was 72.7 seconds, users completed those same tasks in an average of 44.4 seconds on the new site..

Note how task completion rate (Figure 2) was about comparable to major competitors in the first interim test. We think of this level of accomplishment as representing the level that can be achieved by a professional designer before involving user testing, and the fact that we were able to achieve much higher rates after testing is an indication of the critical value of testing and iterative design.

Information Architecture

We began with a proposed information architecture (IA) that outlined the top few levels of the architecture that the School had generated during initial work with another vendor. Our first task was to flesh out this architecture, documenting every site page to create a master IA document. This exercise enabled us to identify areas missing information and to review the

entire architecture for consistency of structure and terminology. We used this document to generate wireframes for testing—live HTML pages that reflect the navigation and a basic text-only page layout.

We began critiques of the IA by analyzing our critical tasks, evaluating competitor sites for structural ideas, and performing card sorting with the design team and in user testing. Through user testing and in design sessions with our clients, we then evaluated the IA. Due to the breadth of this project, we worked with many different groups within the School and took very different approaches to working with individual units. Each had different goals for the site and work styles. While the School had some central authority, they wanted individual units to have as much flexibility as possible to make their web sections meet their needs. The following three examples illustrate three central contributors to a successful IA: extensive collaboration with domain experts, targeted user testing, and participation of key decision-makers:

ADMISSIONS: EXTENSIVE COLLABORATION - Getting prospective students to apply is one of the primary missions of the site. The Admissions team was very proactive in site design, readily critiquing and redesigning their section. They participated in several design sessions with our IA team. Between sessions, they also worked on refining site design. Throughout this process, our IA team provided input based on user testing and best IA practice, such as consistency and clarity of labels. The Admissions team contributed substantial domain knowledge and refined their goals for the web site.

RECRUITER INFORMATION: IN-DEPTH USER TESTING - The Recruiter section is a sub-site that provides

information and applications for recruiters, such as how to schedule campus interviews. Because this site is smaller than Admissions, we developed a proposed IA after only a couple of collaborative design sessions and user testing. The IA continued to have aspects that were controversial and unclear. To resolve the problem, our usability team traveled to New York and Chicago with Business School administrators to conduct user testing with the School's top recruiters at their office sites. Meeting the recruiters in their workplace and talking to them about their recruiting processes gave us valuable information about how they used school web sites to coordinate their recruiting plans. The user testing itself successfully identified ways to improve the site, and the presence in the user testing of observers from the Business School was helpful in persuading them in the necessity of those changes.

TECHNOLOGY: PARTICIPATION OF THE KEY DECISION-MAKER -

The Technology section primarily provides computer support information for students, faculty and staff. Originally Technology was not identified for user testing—none of our primary tasks were related to this section. As a result, it was originally redesigned solely by our IA team by checking it against our internal IA guidelines and reviewing it for clarity and consistency. Furthermore, because of the costs of rewriting content, we were originally asked not to make IA changes that would require new content. Toward the end of the design process, however, we noted that Technology was most in need of improvement, and our clients chose to promote it to a higher importance. As a result, we implemented a high-speed series of IA redesigns and critiques. One of our usability

specialists also asked students in a user interface design class to review the section, resulting in highly useful critiques and redesign proposals. The resulting redesign dramatically clarified and reduced clicks to information and cleared up ambiguity of categories. A crucial part of this transformation was the School's top-level manager in Technology. He quickly and efficiently approved drastic reductions in the scope and complexity of the information, based on his critical understanding of the mission of his department and the role of the web site within that mission. Without him, many of the most significant improvements wouldn't have been possible.

Information Architecture Design Choices

The previous Business School web site grew organically from multiple independent groups. As a result, it was not consistent, had no overall architectural plan, and lacked orientation cues and navigational paradigms to help users find information (Figure 6). Our baseline user testing showed us that people had significant difficulties finding information. Our final IA created a consistent navigation scheme throughout the site. Examples of this consistency include:

CONTENT We created a Contacts page and a FAQ page for each main section (e.g. Alumni Contacts and Alumni FAQ). Users specifically wanted to be able to find contact information quickly and easily, and our previous experience indicated that FAQs are a good way to support users who are unable to find information otherwise [1].

TERMINOLOGY We made abbreviations, punctuation, capitalization, and references to the school more consistent throughout the site.



Figure 6. Sample Pages from the original University of Michigan Business School web site. Various sections had completely different identity programs, layouts, and navigation schemes.

LINK AND PAGE TITLES In choosing link titles, our goal was to make them precise, unambiguous and understandable in a broad context. In many cases, we had to balance terms that were industry standard with those that are easy for a more general audience to understand. We also had to include terms the Business School wished to promote. For example, recruiters preferred the term "Placement Reports" for a page that provides demographics of students in a graduating class. The School, on the other hand, preferred the term "Employment Profiles." In principle, both terms appear unclear to people outside the industry and might be unfamiliar to new recruiters. Our final solution was a category title of "Class Profiles & Placement" that had some benefits of both proposed terms.

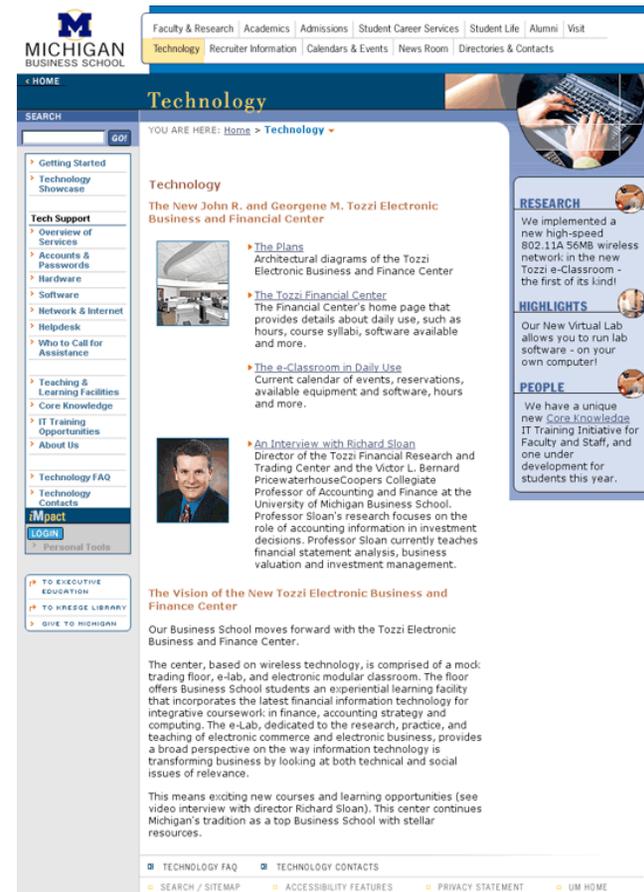


Figure 7. Final Page Layout. Each of the 12 primary sections has a unique color scheme from a common palette. These variations add color and attractiveness, while quickly signaling users when they move from one section to another.



Figure 8. Shared Links. Within a section, such as Academics, we've listed certain shared links above the main navbar, like the list of Academic Departments in this example. These appear on every page and allow rapid navigation to critical pages.

Visual Design

Our goals for the new web site design were to communicate the Business School brand, create a layout that was easy to understand, and enhance overall aesthetic appeal. Our client wished to communicate that it was a leading business school for research, with diversity and global appeal. They sought a professional, prestigious image with a relatively minimalist design. At the same time, design needed to contain a significant amount of content. Each page also needed to have some design variation while maintaining a consistent look.

The Layout

Our target screen size was 800x600 minimum, and our layout scales to increase the width of the content region with larger windows. The screen (Figure 7) shows a school logo at top-left, and the primary 12 sections of the site across the top of every page (Figure 9), enabling users to quickly navigate to any part of the site. The section title appears in the top blue area on all pages and sub pages, making it easy to locate. Each section also uses a photo on the top-right within a circle. This circular element helps unify the design with the circle in the logo and breaks up the squared feel of heavy content areas. The left-hand side lists a link to the Search page, a link back up to the current section, "shared links" that appear on every page within a section, and navigation to pages below the current page (Figure 8). At the top of the content area is a breadcrumb trail that indicates the user's current location on the site, followed by the page title, and at the bottom of each page are a set of utility links, with FAQs and Contact pages for each section. On the right of each page is an optional call-out section, or sidebar,

to provide news, features and links to critical information. This changes from main and sub pages. Main pages are more graphic, as there are only 12. Sub pages are less graphic, focused more on content and download speed.

User Reactions to Visual Design

Our clients' original preferences led them to select a clean, minimal design with nominal color and significant white space, hoping to convey prestige. User tests showed people wanted more color. Our final design brought in more colors, while maintaining clean lines and a simple presentation. These colors (shades of blue plus highlights from a wider palette) helped add weight to the site, conveying a sense of rich information. Users also loved photos, preferring colorful shots with interesting angles. They preferred images of people in action (as opposed to posed), and close-in shots of people. The photos featured Michigan-specific sites, helping to relay a collegiate atmosphere.



Figure 9. Top-level navigation. These 12 categories appear at the top of every page, enabling rapid navigation to any primary area from any page on the site. While fewer categories would save screen space, we chose to list more so that labels could be clear and specific. This also reduces the time required to locate information.

Navigation Design and iMpaCt

Our goal was for navigation to be consistent throughout the site, while integrating public and intranet information. As such, the new design needed to group information topically (Figure 10), rather than have



Figure 10. Public and iMpaact Links on the Faculty & Research page. Public links appear at the upper part of the navigation and intranet (iMpaact) links in the lower part. Until someone logs in, the iMpaact links are dimmed, but remain visible so that users who aren't logged in know where to find the information

people search separate hierarchies for the public and secure portions of the site. This strategy represents a significant departure in this design from the sites of other schools, and introduced the most complex design tradeoffs. In addition, in the design of the navigation bar, using HTML text rather than images allows navigation links to be dynamic and easily-modified, as well as flexible in size for readability.

All pages on the site have a location in the site hierarchy and a single primary location indicated in each page's breadcrumb (Figure 11). Thus, you can reach any page on the site by choosing a top-level category and then navigating through links in the left side navigation. This was a powerful rule for achieving consistent organization within the site.



Figure 11. Breadcrumbs. The breadcrumb display shows a user's position in the hierarchy, allowing more rapid navigation within sections. However, in user testing, the majority of users skipped the breadcrumbs and used the Back button of their browser or the Top-level navigation.

Left-Hand Navbar

As users navigate, the navbar on the left shows links to pages that are children of the current page. If a page has no children, siblings of the current page are shown with the current page highlighted in the navbar. Thus, typically users see only one level of navigation and can only easily navigate to a sibling page if they view the lowest level of the hierarchy. We decided to show only one level to maximize available screen real estate,

simplify the navigation display, and provide a navigation scheme that works well throughout the site, even when lengthy options are displayed.

Within the navbar, we applied certain visual conventions. We used headers and dividing gaps to group links. Links that go outside the site ("external links") get bent arrow icons (↗), while ordinary links get simple arrow icons (→). We used crosslinks frequently in the site. Indicated by double arrows (↔), the crosslinks jump to another section of the site—that is, to pages not logically located under the page being viewed. Crosslinks provide multiple routes to information, substantially improving the ability to find information. The indicator also helps prevent disorientation when jumping to an unexpected point in the hierarchy.

Grouping Public and Secure Links

Public pages are located at the top of the navigation. Pages that require login are at the bottom, below the "iMpaact" label (Figure 10). iMpaact is the name for the intranet. We created this grouping to make it clear which pages require login. This design was the result of a complex tradeoff—its disadvantage is that some links that require a login fit more logically next to public links, and by putting these links below, they seem like a lower priority. The alternative would be to mix links in the list, alternating between public and secure links. If unlabeled, these would be disconcerting when a user is asked to login when not expecting to. Thus, mixing the links would require labeling every link that required a login or otherwise identifying the distinction. This would require an overwhelming number of labels or learning the "code" used to indicate the distinction.

Where Do You Go When You Log In?

Intranet links are visible even before logging in, in order to keep the user interface stable—we wanted pages to be possible to find even before logging in. When someone is not yet logged in, and they click an intranet link, they first go to a Login page. After entering their login, they arrive at the page they'd originally clicked.

This usually works quite well, but we've also added a "Login" button for those who are simply looking to login. A major tradeoff appears at this point: where should people end up after logging in? They could simply go back to the page they were on when they hit "Login," but that can be confusing since in many cases, minor changes may not be immediately perceptible; intranet links on that page will be un-dimmed and the "Login" button is renamed "Logout." Plus, all this may occur below the fold of the page, since public links may push down this whole area of the page.

We chose an alternative, taking people to a dedicated intranet portal page "Personal Tools." This page provides customized personal resources and shortcuts, based on user type, such as Faculty vs. Students. Users can change their password or update their profile from this page. The downside is that users who enter using the "Login" button lose the context of the page they were logging in from and may have to retrace their steps.

Utility Pages

We created custom design treatments for several utility pages whose links appear on nearly every page or are

frequently encountered. These pages included Search/Sitemap (Figure 14), Page Not Found (and other error conditions), Login, Logout (Figure 12), Accessibility Features (Figure 13), Privacy Statement, and confirmation pages (from filling out forms). Most of these pages fell outside of the primary navigation structure (aren't within one of the 12 main sections) and had no navigation within them, so the left-hand navigation area could be dropped. This freedom of layout enabled us to provide greater visual variety on the site without compromising consistency.

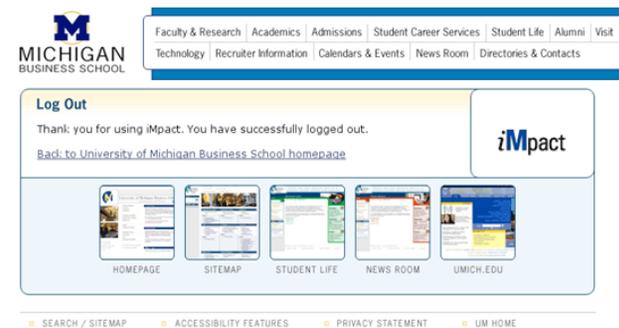


Figure 12. Logout. When users log out from iMpack, we provide suggestions for likely pages they may want to visit next. This general strategy quietly educates the users about resources available on the site. This list of screenshots of suggested pages is also used on our Page Not Found page and was inspired by the Page Not Found on www.apple.com.

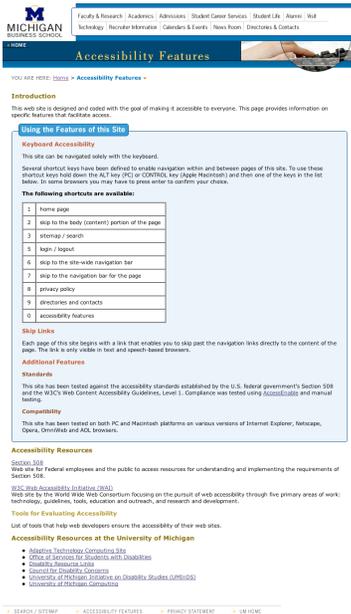


Figure 13. Accessibility Features. This page provides information on how to optimally use accessibility features such as keyboard shortcuts. For users who aren't familiar with web accessibility, it promotes the importance of accessibility by making it relevant to this site.

Our goal for these utility pages was to provide best-practice designs, intimately integrating content design with layout. On the site as a whole, content is dynamic and independently authored by dozens of groups, so tight integration of design and content is a unique opportunity on utility pages. We asked students in a user interface design course to create design proposals for a few of these pages. We used their design critiques as a launching point and reviewed similar pages from a wide variety of sites. These utility pages were among the few where we could use a unique approach, creating innovative, interesting pages that focused on their utility to the users and provided variety to the design.

Accessibility Features

One of the core utility pages provides information on accessibility. The new design conforms to web accessibility standards established in Section 508 [4]. The style guide for new content specifies following 508 standards, with exceptions defined where it would be cost-prohibitive (which the standards allow for). We customized the AccessEnable tool [5], which automatically evaluates web site code, to enable rapid checking of the site for quality assurance and compliance to many style guidelines and accessibility standards. This automated evaluation makes it easy for the Business School to ensure the quality and accessibility of newly developed content.

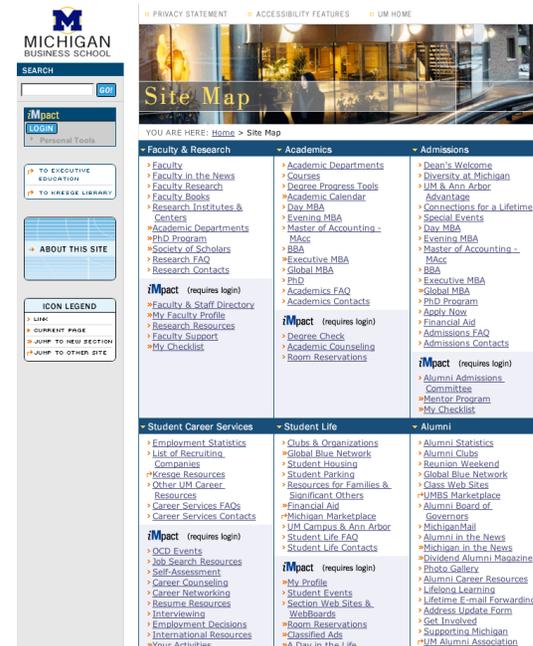


Figure 14. Sitemap. This Search/Sitemap page is an excellent starting point for users, highlighting common pages throughout the site. Because of this page's extensive content, we created headers of each main section, enabling users to see the main links in each section. In one quick look, users can understand the wealth of information available on the site and how it is organized.

Conclusion

The redesign of the University of Michigan Business School web site was done in a relatively short time and at a relatively massive scope. Because of the project's scale and importance, the client was interested in a design process that would substantially reduce risks in delivering on the project goals, and so we were able to

apply critical usability methods and research techniques. This resulted in demonstrable improvements with, for instance, the task completion rate going from an original 61.7% to 92.5% in the final testing, as compared to our top competitor's rate of 76.1%.

The redesign accomplished:

- An improved information architecture, with improved categorization and labeling that achieved shorter, simpler tasks and greater cross-site consistency.
- Public and intranet sites combined under topical categories, with related information all in one place.
- A new image for the School, prestigious clean, and visually interesting.
- Much greater accessibility for people with disabilities.
- A new site infrastructure that, based on applying our prototyping tools, makes it dramatically easier to make future design improvements and apply those improvements consistently across the whole site.

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