

TEAM SAP

DEVIN BLAIS
ALLISON GALLANT
HOLGER KUEHNLE
JON MALOTO

MASTERS OF HUMAN COMPUTER INTERACTION
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executive summary

This document marks the completion of the 2008 Masters of Human-Computer Interaction capstone project at Carnegie Mellon University. It provides insight into the design and evaluation our interdisciplinary team has done since finishing the user research phase in May. Our client for this project is SAP's Design Services Team, which is part of the Office of the CEO at SAP and was created to advocate design-led innovation within SAP and with SAP's customers as well as to drive design thinking into all aspects of the SAP strategy.

The goal of this project was to create a social tool which enables companies to effectively attract and engage the next generation of workers by connecting people, places and resources within the enterprise to optimize the way work gets done and knowledge is shared.

Based on the insights we gathered from our user research in the spring, we narrowed the project's focus down to the area of knowledge sharing within the enterprise. We identified specific needs of millennials pertaining to knowledge sharing, which we subsequently validated with millennials currently in the workforce.

To address those needs, we followed a design process in which we continuously evaluated our design ideas by conducting user tests with low to high fidelity prototypes. At the end of this refinement process stood a novel knowledge sharing solution, which, unlike other existing solutions on the market, does not try to directly store the knowledge itself but rather enables employees to connect to their co-workers who are knowledgeable in an area of expertise of their interest. This system, which we call Forté, provides a concise workflow for looking up people knowledgeable in a specific area and determining if and how they can be contacted based on whether they prefer to be contacted by e-mail, instant messenger, phone or face-to-face.

Our final solution is comprised of a desktop widget which allows quick access to the system's essential functionality of setting communication preferences, searching for knowledgeable people and referring back to recent searches. Within the search results, users can quickly determine a person's availability based on the person's communication preferences and calendar status as well as their association with the expertise the user searched for. The system also visualizes the social connection between the user and all of the search results. A visual expertise browser allows users to look through related knowledge areas and provides a helpful alternative to manual searches. Additionally, a full profile page for each person can offer more specific information about that person.

Forté helps to motivate talent by encouraging collaboration across teams by utilizing millennials' propensity for technology and an informal work environment. While being primarily intended for millennial workers, it can also help managers and HR to identify talent and thus staff projects with the right people as well as discover talent and expertise gaps within the company.

introduction

OUR TEAM

We are an interdisciplinary team of four Masters in Human-Computer Interaction students at Carnegie Mellon University undertaking a capstone project that allows us to apply the knowledge we gain in the classroom to a specific design problem presented by our client. Our diverse backgrounds range from design and psychology to engineering, computer science, and information systems. Our diverse skill set enables us to provide our client with a 360-degree view of the problem space and helps us in finding innovative design ideas to solve the given problem.

In detail, our team members and backgrounds as well as each team member's responsibilities are as follows:

DEVIN BLAIS | Document Lead, User Testing Lead, and Webmaster

Devin has a background in information systems and is particularly interested in social networks. As the project's user testing lead, he oversaw all of the preliminary user testing including surveys, interviews and contextual inquiries, as well as ensured that our design solutions were grounded in the data obtained from our user research. As document lead and webmaster, his responsibilities included maintaining a list of research sources for the team, co-ordinating work on written deliverables, and implementing the team's project website towards the end of the project.

ALLISON GALLANT | Design Lead

Allison has a background in communication design and cognitive psychology and as the design lead she was responsible for developing and ensuring the use of a consistent, flexible and professional design language throughout the course of the project.

HOLGER KUEHNLE | Technical Lead and Client Liaison

Holger has an academic background in computer science and design as well as professional experience as a project manager and software developer. As the project's client liaison, he was the representative face of the team to the client and ensured smooth communication of the team's activities with the client throughout the project. As technical lead, he was responsible for facilitating prototype development as well as organizing the team's technical resources.

JON MALOTO | Project Manager and Meeting Secretary

Jon has an academic background in electrical and computer engineering as well as professional experience as a software developer. As the project manager and meeting secretary, he concentrated on keeping the project on track, managing the group's time, taking minutes at each team meeting, and ensuring the timely delivery of an outstanding final product.

ABOUT THIS REPORT

This report marks the end of the summer semester, and as such, the conclusion of the project. The duration of this project is set to eight months, from January to August, with a division between the spring and summer semesters in May. During the spring semester, all group members are full-time students and as such are still engaged with other courses throughout the semester. In the summer, sufficiently more—if not all—of our time is allocated for the project course with only minor university engagements besides the capstone project. While the spring semester primarily focused on user and background research in the knowledge areas applicable for this project, the summer semester mainly emphasized design, prototyping and evaluation.

The contents of this report documents the steps our team took to generate a user-tested working prototype. Features of our design are discussed in detail, along with the rationale behind the design decisions related to each feature. We briefly revisit the user data gathered from spring semester and demonstrate how each feature meets the identified needs. We also examine some possible future directions for the project, which we could not cover in the time allocated but could be explored by our client.

OUR CLIENT

Our client for this project is SAP's Design Services Team, with our contact being Lorriane Nault, Senior Interaction Designer. The Design Services Team is part of the Office of the CEO at SAP and was created to advocate design-led innovation within SAP and with SAP's customers as well as to drive design thinking into all aspects of the SAP strategy. This interdisciplinary team works with customers and partners to design custom solutions and services and integrates key learnings into SAP's platform and suite of tools. SAP itself is the world's leading provider of business software with over 43,000 customers in more than 120 countries ranging from "distinct solutions addressing the needs of small businesses and midsize companies to suite offerings for global organizations."

PROJECT OVERVIEW STATEMENT

In order to guide our scope throughout the entire project, we drafted a project overview statement which set some bounds on our research and acted as a yardstick to measure our design efforts against. The project's problem area, goals and objectives are described below.

Problem/Opportunity

While the largest generation of workers is starting to retire, a new generation of employees—the millennials—are entering the work force. This new generation of employees is well versed in technology, spending a large amount of time using online social tools, and, although being seen as self-focused, are good at collaborating and working in teams. When compared to previous generations in the workforce, however, millennials have very different attitudes towards technology and loyalty towards the company. This well defined difference between generations has created a gap that has led to a talent crisis due to difficulties in sharing and transferring knowledge between the generations.

Project Goal

Create a social tool which enables companies to effectively attract and engage the next generation of workers by connecting people, places and resources within the enterprise to optimize the way work gets done and knowledge is shared.

Project Objectives

- » Discover the unique factors that millennials need to be successful in the workforce
- » Understand how to motivate talent among the Millennial Generation in order to change current talent management systems to support the greater intent of millennials in developing their own skills
- » Determine how internal social networking addresses the needs of the millennial employees and consider how a social tool can be used by both HR and managers to find and attract talent, staff projects with the right people and keep them happy and efficient at work
- » Leverage millennials' propensity for using technology and their sense of community to encourage collaboration and exchange of corporate knowledge

PROJECT PHASES

Spring Semester: User Research

The spring semester of the project was dedicated to both background and user research to help us acquaint ourselves with the many dimensions of our problem space. Below is a quick summary of our general results. For further details, please see the Research Findings Progress Report.

Background Research

Our project required us to investigate three main areas: the Millennial Generation, human capital management and its competitive space, and concepts connected to both corporate and personal social tools and networks.

Millennials are now entering the workforce, and the corporate world is struggling with attracting and retaining this new generation. Millennials are known to not have the same company loyalty found in previous generations, and therefore are more likely to job hop. Yet those in the Millennial Generation can bring a lot of talent to the company, in part due to their comfort with technology and ease with working in teams. Their overprotective baby boomer parents have pressured them to achieve, and in some instances, they live vicariously through the millennials' accomplishments. Although the literature has a lot to say about millennials, it is important to note that these findings may simply be over generalized stereotypes and inaccurate preconceptions.

We also investigated the concept of Human Capital Management (HCM), focusing primarily on Talent Management. It was important for us to understand the current approaches used by companies and consider where our solution might fit. Talent Management is increasingly becoming an area of focus as many industries are beginning to experience what is known as the 'talent shortage crisis'. To alleviate this problem, some companies have invested in HCM solutions in the hope of gaining a better understanding of their loss of talent. We also felt it was important to take a closer look at the current HCM solutions provided by companies other than our client. We noticed that many competitors provide only point solutions, while our client is one of a few companies that offer a holistic approach, combining all areas of HCM into one package.

Our final area of background research focused on current corporate social tools, and the benefits of social networks. In our spring report, we looked at a particular case study of Siemens ShareNet, in which incentive were necessary to encourage participation from employees. We also looked at current popular online social networks, analyzing the dynamics of what made them successful and how the corporate world has made use of them.

We concluded our background research by conducting an academic literature review on other topics related to our project including knowledge management, semantic mapping, privacy, and millennials.

User Research

After conducting the background research, it was important for us to look into more specific information regarding the roles, responsibilities and contexts of our potential users. Our first step was to conduct some preliminary interviews with millennials and human resources personnel. From these preliminary interviews and previous background research, we distilled our findings into a model that would serve as a guide and an inspirational tool during the design phase of our project. In particular, we were interested in seeing how our insights matched the interests of millennial workers, human resources or both. (See Appendix E – Interests Model of Millennial Workers and Human Resources)

After conducting our preliminary interviews, we decided a survey would be beneficial in answering many of the questions we had regarding millennials. We targeted the survey at recent graduates of college who had just entered the workforce. A key question that we were interested in was what factors can motivate and retain young talent. The top responses we received when asking millennials what would encourage them to stay longer at their current job were “more money” and “opportunities for advancement”. Other popular choices were for the work to be “more intellectually stimulating”, millennials to receive “more benefits”, and to encounter “less red tape”. (See Appendix D – Millennials Survey Results Summary)

Other questions asked in the survey investigated the millennials’ tendency to ‘job hop’ and relationship with manager. (See Appendix D – Millennials Survey Results Summary)

The main core of our user research in the spring involved conducting contextual inquiries (CIs). We conducted eight CIs with millennials, two with managers, and one with HR personnel. Detailed models of our findings can be found in Appendix F – Consolidated CI Models.

Summer Semester: Design

Scope Refinement

From the research we conducted in the spring semester, we identified areas of opportunity with regards to motivating talent, determining success, leveraging social tools, and supporting knowledge sharing for the millennial worker as described in our project objectives (see Research Findings Report, pg 4). After consulting our clients and considering which area we would best be able to tackle in our limited time, we decided to focus on supporting knowledge management within the company. This was the issue which our team felt compelled to address not just because of the problems that arose in the data and solution opportunities that they implied, but also because it seemed the most challenging in terms of generating interesting solutions.

Walking the Data and Ideation

With knowledge management as our focus, we examined the models from our contextual inquiries as well as the interpretation records from the modeling session and identified the needs of each user group (millennial workers, managers, and HR personnel). This process allowed us to become reacquainted with our data, but with a tighter focus. We generated a table of needs statements that would be used in several stages of our design process, particularly when creating personas, scenarios, and conducting our needs validation sessions. We also used this table to assist us in brainstorming ideas for what solutions would address those needs.



Figure 1 – Matching user needs and solutions

Personas

We created eight personas as tools to facilitate our design process. These personas came directly from our user data, as we mapped our users from the CIs on various attribute scales, and analyzed patterns to pull out. From the four millennial personas that we created, we selected two (Karen and Jason) as the primary personas for our designs. This decision was based on the user types that could enjoy the most benefit from our solution. (See Appendix J – Personas)

Prototyping

With validated needs and personas as inspiration, we began to brainstorm concepts and sketch out ideas for our solution. Our first iteration was a paper prototype which we user tested with eight millennial workers. From the feedback we received, we began to create higher fidelity prototypes with quick iteration cycles after every few user tests. We conducted nine user tests on high fidelity prototypes in total. Towards the end of these user tests, our users had less and less difficulty with the tasks, resulting in only minor changes to our prototype. The last few user tests showed no issues with the usability of our system, proving we had not only designed a system that meets the needs of working millennials but also allows for easy interaction to keep them coming back.

why forté

^a http://blog.hbs.edu/faculty/amcafee/index.php/faculty_amcafee_v3/comments/enterprise_20_version_20/

Introduced by Professor Andrew McAfee at the Harvard Business School^a, enterprise 2.0 has been gaining a great deal of attention since its introduction in May of 2006. McAfee officially defines enterprise 2.0 as “the use of emergent social software platforms within companies, or between companies and their partners or customers.” This push to use social software in business is doing a great deal to help support millennials as they enter the work force. Millennials have been utilizing social networks throughout their young adult lives and it only makes sense that businesses continue this trend in their attempt to attract and retain the next generation of workers.

Our user research shows that millennials are looking for a more informal work environment and want the workplace to be more of a community than just an office building with coworkers (see Appendix F – Millennial Cultural Model and Appendix D – Millennials Survey Results Summary). Enterprise 2.0 incorporates these factors by bringing together individuals in a more informal environment than is traditionally seen in the corporate world.

The traditional knowledge management system consists of a knowledge repository; a place where individuals go in search of the information they need. While this works well in principle, there are numerous reasons why this form of knowledge management tends to fall short, especially with millennials. Our user research showed that even if individuals knew of a repository where they could look information up, they usually assumed (or knew) that it was out of date and would not bother trying to find the information they were looking for (see Appendix D – Millennial Flow Model). A much more likely case with the users we witnessed was to turn around and simply ask a coworker. While this worked well in some instances, if the user did not know who to ask they would end up being bounced around between people until they eventually found the expert they needed.

In order to facilitate the needs of millennials and the recent move to enterprise 2.0, we decided to develop a different form of knowledge repository. Instead of supplying users with the actual information they need, we decided to design a system that would tell users who to ask for the information they need. There are a number of reasons why this form of knowledge management is better than the traditional repository:

- » Information is never out of date
- » Supports informal work environment millennials are looking for
- » Supports sense of community to help retain millennials
- » Rich, tacit knowledge cannot be written down. The best way to spread this type of knowledge is by “locating someone with the knowledge, pointing the seeker to it, and encouraging them to interact.”³⁴

example scenarios

NEW EMPLOYEE

Karen has just recently started working at a large company and is still learning the ropes. Her company mandates the use of Forté, a knowledge sharing system, which shows each employee's area of expertise, their communication preferences, as well as their connections within the company.

When she turns on her computer in the morning, Forté automatically logs in. Knowing that her communication preferences retained their state from the previous afternoon, Karen doesn't need to adjust them.

Karen is assigned a project in which the clients would like to use Viral Marketing. Unfortunately, she doesn't know anything about Viral Marketing. Karen opens up the widget and types 'viral marketing' into the search field. Scanning the search results, Karen finds Andrew, and decides he would be a good person to talk to. However, Andrew is in a meeting and would prefer not to receive IMs or phone calls. Karen decides to send him an e-mail with her questions.

Later that afternoon, Andrew replies with a very helpful and detailed response to her questions. Karen still has one further question for him, though, and would like to give him a call. However, she did not take note of his phone number when she looked at his mini-profile. She quickly opens up the widget and expands her 'Recent Searches' panel. Her search for 'viral marketing' is at the top, and she sees Andrew's name as soon as she expands the list. Karen clicks on his picture to go to his profile where his number is clearly displayed. When she calls, Andrew picks up right away, and answers her additional question.

CURRENT EMPLOYEE

Jason has been working at a large company for the past two years. His company also uses Forté as their knowledge sharing system. Jason recalls a specific Individual Change Management model that he would like to learn more about, but unfortunately doesn't remember exactly what it was called. Jason opens up the widget and inputs 'individual change management'. Knowing that he would like to call up a direct contact to get the information right away, he expands the filter panel. He slides the degrees of separation slider to only allow direct contacts and toggles the phone button. He then presses the 'Go' button to view the results.

As soon as the results load, he notices that the expertise browser lists several specific models under 'individual change management'. He easily recognizes 'ADKAR' as the model he was thinking of. As soon as he clicks on it, the results dynamically update to include only people who are knowledgeable about 'ADKAR'.

Near the top of the list, Jason notices a friend that he took a training class with about a year ago. In the mini-profile, he clicks on the phone icon to find his friend's phone number and gives his friend a call.

design details

Forté is a next generation knowledge management system that focuses on spreading knowledge throughout an organization by connecting users with experts in the field. To demonstrate the full capabilities of Forté, two scenarios are presented to establish a general understanding of the system. Following the scenarios, details of the entire system are discussed along with the evolution and rationale behind all the designs.

SYSTEM-WIDE DESIGNS

Status

Goal

Allow users to see the current status of themselves and others as determined by their calendar.

Design and Rationale

The status of an individual appears on their desktop widget, mini-profile, and main profile page. In all instances, the user's status is directly tied to their corporate calendar. Companies often mandate the use of a calendar (e.g. Microsoft Exchange) for scheduling meetings, so it is feasible that the user will always record information about meetings and appointments (and by extension, availability) in another system. By linking the status message to the calendar, the burden of having to set a status³⁹ is eliminated.

When the user's calendar is empty, the status message is '[user] has no scheduled appointments until [time of next appointment]'. When the user has an appointment, such as a meeting, this will be reflected accordingly, as well as the time at which that appointment finishes. When the user has logged off the system, this is also reflected in the status message.

Our early designs allowed the user to customize their own status message, with each status message even corresponding to a specific set of communication preference settings. However, feedback regarding this behavior was somewhat negative, as it required the user to set too many 'status-like' indicators. Furthermore, it is not always clear that a certain status message (e.g. in a meeting) will always correspond to the same set of communication availabilities. For example, a person 'in a meeting' but facilitating the meeting would most likely be unavailable for all communication, but a meeting attendee might be available for e-mails and phone calls. Thus, we refrained from linking the status message with the communication preferences. In addition, we received feedback that many users forget to set their status on instant messaging programs from time to time. As a result, many individuals tend to ignore the status and try to contact the person anyway. In this way the status message loses a great deal of value and we did not want this to happen in Forté.

Trade-offs

By not allowing the user to specify their own status message, we prevent the user from providing other Forté users with more context about their current availability. If we allowed users to do this, however, then there would be several indicators (perhaps too many) of the user's availability (the icons plus the customized status message). By standardizing the availability indicators, users don't have to worry about setting the right status message that conveys their availability/unavailability, but instead can use the communication preferences to do so.

Communication icons

The communication icons appear on the desktop widget (page 16), results page mini-profile (page 30), and the user's profile page (page 44). In each instant they serve a slightly different purpose, but their look remains constant throughout all three areas of the system. Additional details on how each area uses the communication icons can be found by referencing the aforementioned page numbers.



Figure 2 – Communication preferences icons

Design and Rationale

There are a total of four communication icons, each of which represent the four communication modes that are most frequently used in an office setting, always presented in the same order: e-mails, IMs, phone calls, and face-to-face meetings. This order reflects how interruptive each communication mode is, with e-mail being the least interruptive. The notion of 'interruptability' and contacting colleagues over different mediums emerged in our user research (see Appendix F – Consolidated CI Models)—millennials preferred to send e-mails if they didn't want to interrupt the colleague or if they didn't know whether they were interruptible. Conversely, if they wanted an immediate response, they would send the colleague an IM through the corporate IM client, or even call or visit them for more pressing issues.

One of the goals of our system is to encourage communication and foster the sense of community within the organization. For this reason, the communication icons are very important. The design of the icons has not changed greatly during the course of our user testing with the exception of the face-to-face icons.



Figure 3 – Evolution of the face-to-face communication icon

The design of the face-to-face icon has gone through a number of iterations because users have had a great deal of difficulty interpreting the meaning of the icon. One of the primary challenges in the design of this icon was the need for it to communicate both ‘face-to-face meetings’ and ‘office location’, since users can click on the icon for a map of the individual’s office location. The images below show the face-to-face icon as it has progressed throughout the course of the design of our system. By the final version, users had little difficulty interpreting the meaning of the icon. The tooltips that pop up once the user hovers over the icon cleared up any additional confusion with the users.

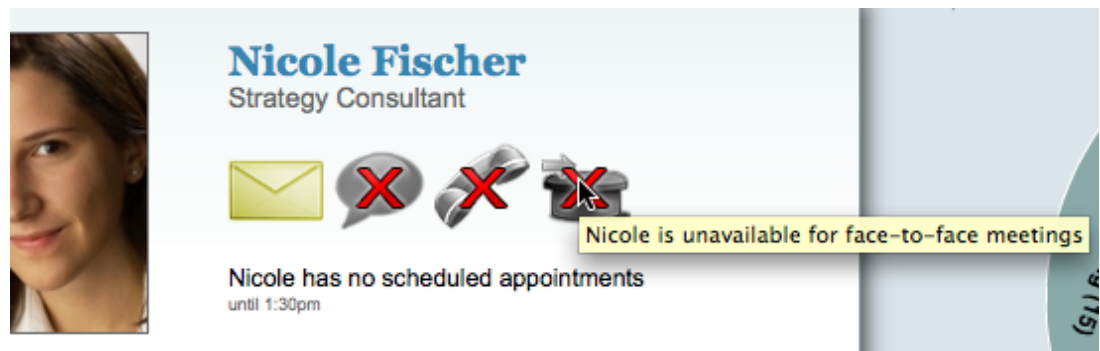


Figure 4 – Tooltips help users to understand the communication icons

Trade-offs

One of the biggest trade-offs related to the communication preferences is that Forté relies on them in order to convey more context with regards to a person’s status message and availability—thus, users must set their communication preferences to reflect whether or not they wanted to be contacted. If users never change their preferences (e.g. always available or unavailable for all the modes of communication), then the icons lose their value.

Another, more minor, trade-off is that users can only be either available or unavailable for a mode of communication, despite the possibility that users might like more flexibility in conveying their preferences. Our initial designs implemented the communication preferences in a different way, where users had to rank their most preferred mode and least preferred mode. The feedback we received from class critiques, however, helped us come to a conclusion that the user should not be forced to rank their preferences, but instead just be able to indicate whether they will be responsive or not to messages sent over that medium.

Filters

The filters are available in both the widget (page 20) and the search results (page 22). Additional information on how the filters are used in those areas can be found in their respective sections.

Goal

Allow the user to find search results based on specific criteria: degrees of separation and communication availability

Design and Rationale

While deciding which person to contact in the company involves many factors, two important factors are how the user knows this person²⁷ and how this person prefers to be contacted. The relative weight of how these factors determine who the user eventually contacts is only known to the user and varies highly by context, thus, the system does not try to guess which is most important but rather leaves it up to the user to specify as an important criteria.

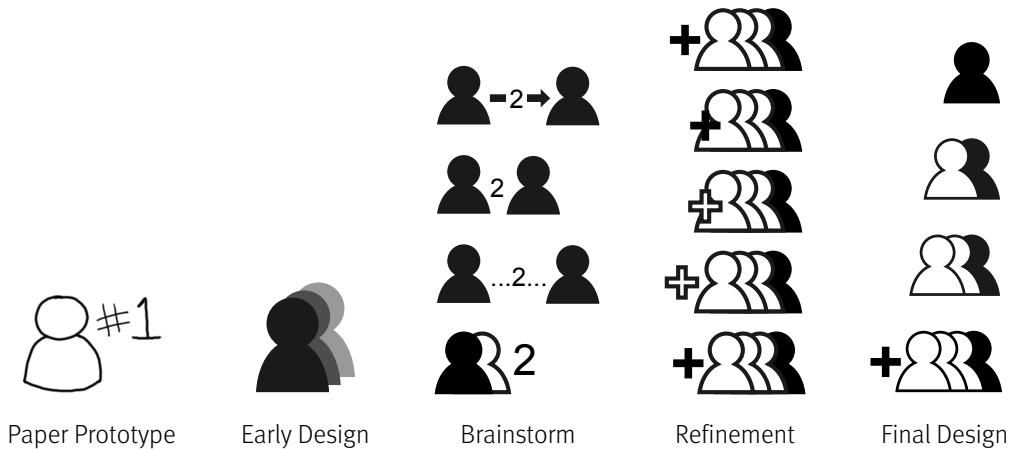


Figure 5 – Evolution of the degrees of separation icon

The design of the degrees of separation icon took a number of iterations before users fully understood its meaning. In our first paper prototypes we had a simple icon with a number representing the degrees of separation. Users had some difficulty understand the meaning of this icon. Some users thought the number was the number of the result, while others never figured out what it meant. Another big problem that arose was the concept of degrees of separation. Some users were not sure if one degree of separation meant they knew the person directly or there was one person between them. In order to clear up all of these issues we redesigned the icons to better display what they represented. The new icons place the individual as a filled-in icon and stack outlined icons on top of the filled-in icon showing how many people are between the user and the individual they are looking at.

Details on the design of the communication icon filters can found in the ‘Communication Icons’ section above.

DESKTOP WIDGET

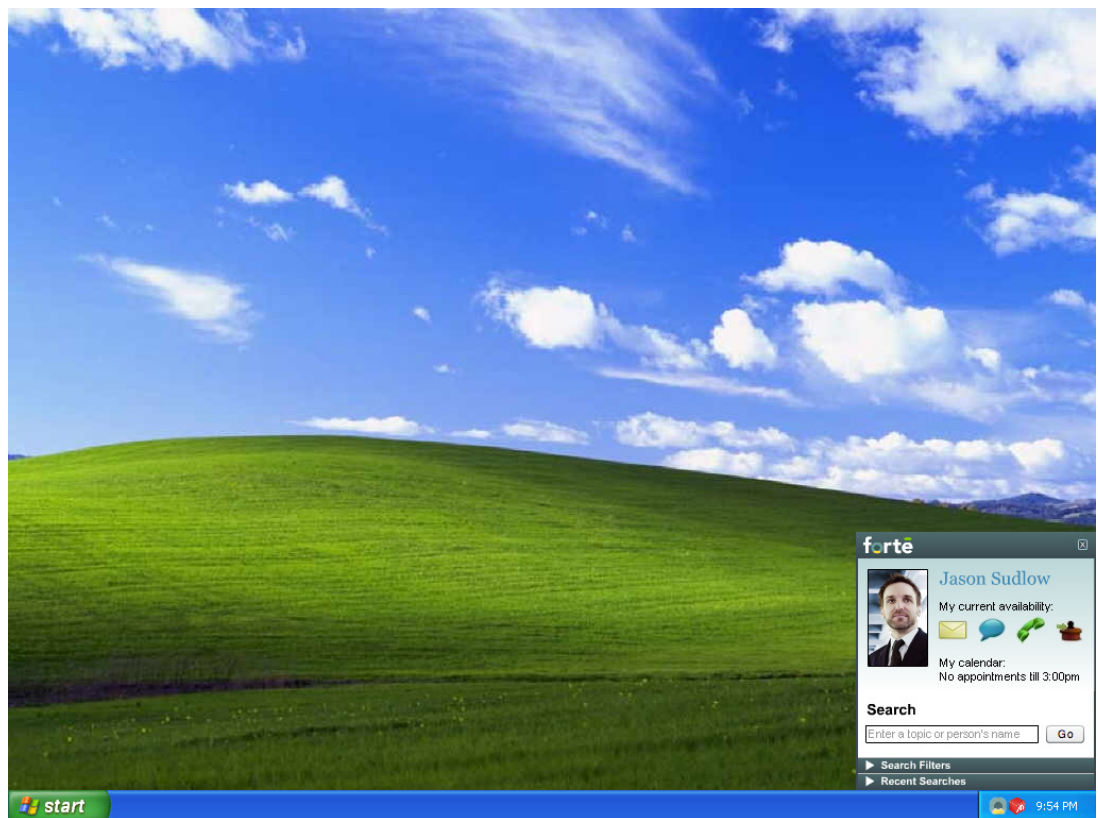


Figure 6 – Forté is easily accessible via the desktop widget

Use and adoption of Forté can be mandated by the company through the installation of a desktop widget, which is always available via the system tray. The widget serves as the main entry point for accessing the system, not only for conducting a search on a specific topic or person, but also for setting the communication preferences that other people see when the user appears as a search result.

In our user research, we observed that talent management and knowledge management tools are usually accessible via a web browser. The user must go to the company portal and find the corresponding link to the tool, which may involve any number of steps. By allowing access to Forté via a desktop widget, the number of steps involved in accessing the needed information is minimized.

User settings

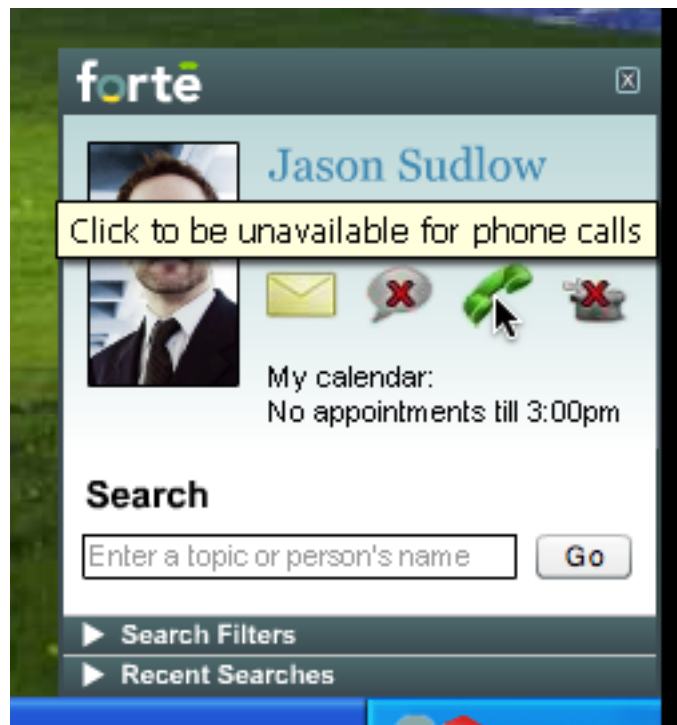


Figure 7 – The widget gives the user a snapshot of what other users see when they appear as a search result

The top section of the widget allows the user to quickly see and configure how others see them on Forté. Only the information that changes on a regular basis is displayed here; other details can be accessed by clicking on the profile picture, which takes the user to their own profile page (discussed in a later section).

Communication preferences

Goal

Allow the user to quickly set which modes of communication they will be unlikely to respond to when another employee tries to contact them via the system.

Design and Rationale

In the search results page and profile page (described later), an employee is displayed as either available or unavailable for e-mails, instant messages (IMs), phone calls, and face-to-face meetings at their office. The user can set these availability preferences in the widget. An icon represents each of the four communication modes that are most frequently used in an office setting.

Clicking on an icon toggles the user's availability; e.g. if they are currently available for phone calls, clicking on the phone icon changes their phone preference to 'unavailable' and the icon changes to reflect this preference (see Figure 7). Hovering over the icon informs and reminds the user of the preference they set when they click on the icon.

When the user logs off of Forté (e.g. when bringing their laptop from the office to a meeting elsewhere, or when leaving the office at the end of the day), their communication preferences are automatically saved such that their preferences stay the same the next time they log on to the system. Literature shows that people tend to forget to set presence indicators³⁹ (such as status), and so having persistent preferences tries to minimize this burden.

Our early designs had the communication icons in a vertical arrangement down the right side of the widget. To set their preferences, a user would drag the icons up and down, with the upper-most icon being the most preferred method of communication. There was also a vertical divider between the icons and the other parts of the user settings section. Early feedback for this interaction method and arrangement, however, was negative, and in later designs we eliminated the notion of ranking, and brought the icons closer to the status message.

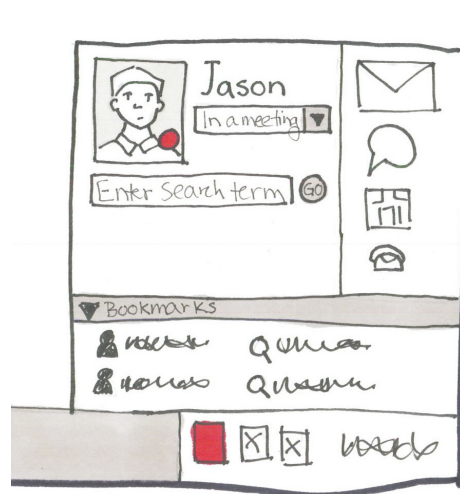


Figure 8 – Early wireframe of the widget showing ranked communication preferences – size indicates preference

Additional information on the communication icons (including trade-offs) can be found in the 'System-Wide Designs' section on page 12.

Status

See 'Status' in the 'System-wide Designs' section on page 11.

Search



Figure 9 – The search bar suggests knowledge topics as you type

In order to find a knowledgeable person on a certain topic, the user must enter relevant keywords into the system. The prevalence of Internet search engines indicates that people who use the Internet on a daily basis (such as millennials) have no difficulties in telling systems what they want through text entry.

Keyword suggestions

Goal

Assist the user in entering the right keywords and convey how many results would be displayed for a search term.

Design and Rationale

As the user enters a search term in the text box, they are presented with suggested knowledge topics that have been recognized by the system. Since users may not always enter the right terms, the suggestions give instant feedback as to whether they should think of different search terms or keywords before conducting the search. Furthermore, the number of results that would be displayed for the suggested topic is also shown, which eliminates the situation in which the user conducts several searches but eventually gives up due to no results being shown.

It is important to convey this information to the user at this stage (where their intent is to specify to the system what they are looking for), because once they have entered some search terms, they expect to be presented with several results, after which they have a new intent of deciding who to contact from the results. If the user is repeatedly forced to input new search terms when they expect to have already successfully carried out that intention, then the system ceases to be useful for the user as they can no longer think of other ways to express their intentions.

In our early designs, the suggestions functioned not much different from autocomplete. However, throughout several iterations we determined that the user would find more value if this feature conveyed more information about the search they were about to perform, and thus we added the result count to each suggestion.

Trade-offs

Since the suggestions are presented as an automatically-updating list beneath the text box, users may interpret the suggestion as a list of recent searches, similar to the auto-complete behavior in web browsers and other programs. However, once the users learn that this is not the case, they will be able to use the feature to their advantage to conduct more efficient searches.

Person search

Goal

Allow users to quickly look up information on a specific person.

Design and Rationale

While the main intent of the user is to find a knowledgeable person on a certain topic, Forté can also be used to find information on a specific person, even for situations not applicable to knowledge sharing. This information could include current communication availability, contact information, current schedule, or any additional information found on their profile. When the user searches for a person's name, they are presented with results that closely match that name.

Initially, our system did not allow the user to search for people as we felt that several systems already exist that help the user with managing their contacts. However, in user testing, people also showed a need to search for a person in order to find specific information, such as communication availability.

Trade-offs

Because the user can type in either a topic or a person's name into the search text box, the system will have to be able to distinguish between a knowledge topic and a person's name. For the most part, this is not a major concern as Forté has access to the list of employee names.

Advanced features

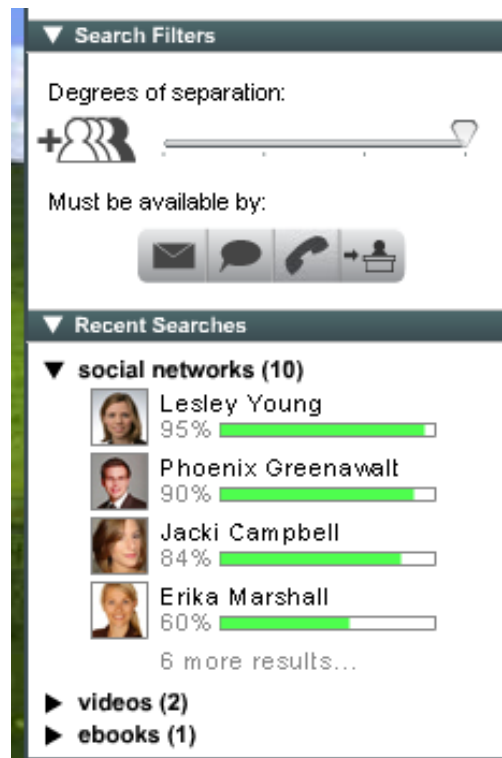


Figure 10 – The user can indicate search criteria to narrow their search. They can also access previous searches and search results

Since the widget is easily accessible to the user, it lends itself to including ‘nice to have’ supplementary features, which assist the user in achieving their main goal of finding knowledgeable people on a certain topic. It is not necessary to make use of these features in order to achieve the main intent, but frequent users will find them to be great time-savers. Thus, they are located in collapsible panes in the widget which are collapsed by default.

Search filters

Additional information on search filters can be found in the ‘System-Wide Designs’ section on page 14.

Design and Rationale

Our earliest designs did not even include search filters because our main concern was keeping the widget small and uncluttered. We quickly realized that space was not as major of a concern as initially thought, so in our initial designs, the search filters were always visible underneath the text box (not in a collapsible pane). We first thought that users would always make use of this feature; however, our user testing (see Appendix M – Wireframes and Paper Prototypes) revealed that people sometimes

confused the communication preference icons with the search filter icons, and that people would tend to use the filters in the search results page after seeing the list of results. Thus, we decided to place the filters in a collapsible pane to avoid confusion. In our later prototypes we also matched the look and feel of the filters with those in the results page to assist users in recognizing the feature's actions.

Trade-offs

As mentioned above, having the filters in a collapsible pane is a way of avoiding any confusion that new users might have with the communication preference icons, as well as reducing clutter in the widget. However, this means that the filters are not as easily found, and we noticed during our user-testing that unless the user is made aware that the feature exists, the filters pane will not be expanded. This is not a major issue because the filters are also available in the search results page, and thus, the user can still specify the criteria to filter their search.

Recent searches

Goal

Provide the user with a way to access information about the people they have recently contacted

Design and Rationale

As a way of providing the user a shortcut for accessing the people they find in Forté, the widget contains a recent searches pane, which lists the user's most recent searches as well as the number of results yielded by that search term. Clicking on the search term displays the first four people that appear in the results page, as well as a link to the remaining people (if any). Each result is displayed as a thumbnail of the profile picture, the name, and how relevant they are to the search term.

In our initial designs (see Appendix M – Wireframes and Paper Prototypes), the recent searches pane was a list of past searches and people that the user 'bookmarked' in the results page. To bookmark a person, the user would click on a star next to the person's name in the results page. However, during our paper-prototype user tests, users had great difficulty understanding that the star was a bookmarking feature. Furthermore, when asked in another task to locate a recently-bookmarked person, users would forget the name of the person and instead remember the search term associated with that person. This is in line with the user's intent of finding a person who is knowledgeable about a specific topic, and not finding the specific name of a person with knowledge about a topic. Thus, we eliminate the burden of having to remember the person's name, but instead present the user with several names and pictures, one of which they can hopefully recognize as being the one they contacted about the topic of interest. For additional information on the removed feature of bookmarking a person, see 'Removed Feature: Ability to bookmark people' on page 27.

Trade-offs

Because of the limited space on the widget, only a number of recent searches are displayed, and only a number of results are displayed for each search. We assume that the user is most likely to contact one of the first few results, and so this pane gives the user quick access to those results. However, it is not always guaranteed that this will always be the case, and so the user must either search for the desired topic again, or remember the person via some other way, such as by looking at recent e-mails or IMs that they have sent.

SEARCH RESULTS

Search results

The search results page is designed to allow the user to quickly and accurately find the best expert in the area of their search. By supplying the right information, users can quickly filter and look through their available options and contact the expert in real time.

Filters

Additional information on search filters can be found in the 'System-Wide Designs' section on page 14.

Design and Rationale

The five filters are located at the top of the screen, just to the right of the search results. The filters allow the user to eliminate results based on their availability (available for e-mail, instant messaging, phone, or face to face meetings) or the degrees of separation that separate the expert from the user. Once a search is performed, the user can turn the filters on and off by sliding or clicking on the various filters. The results will then update in real time, showing only those results that match the filter criteria. If a user enters a new search term, sets the filters, and then clicks the search button, the filters will automatically be applied to the new search results.

The usefulness of the filters was tested multiple times with users. Many users liked the fact that they could only see people they were directly connected to or knew through a friend, and that they could only see people who could meet face to face or chat on IM.

Both the icons and the placement of the search filters took a number of iterations before users could easily find and interact with them. Our initial wireframes of the system had a 'filter tray' that allowed users to add filters to the tray by clicking a large '+'. When we user tested our paper prototypes, users had a great deal of confusion about what the empty box (filter tray) was for, or how to add filters. Most users either ignored or incorrectly used the filter tray.

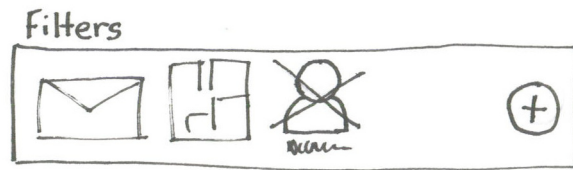


Figure 11 – Filter tray from the paper prototype

Following initial user testing of the paper prototypes, the filters were turned into buttons that could be toggled on or off. When the degrees of separation button was pressed, a slider popped up that allowed users to choose the maximum degrees of separation.

While users had no problem with the other filters, the degrees of separation filter showed many problems. There were two problems with this initial solution. The first problem is that users were confused as to how to use the filter. Since they did not see a slider at first, they didn't understand what the icon meant or how to change it. The second issue was a matter of consistency. In the widget, the degrees of separation slider is always visible (it doesn't pop up once a button is clicked). This inconsistency further confused users, so the slider was added to the filter icons in the search results page so it was always visible.

After much discussion it was decided that the filter bar had two possible positions: on the top next to the search bar or on the bottom next to the search results. Versions of the system were made with both options and opinions from others as well as our own justifications were taken into account. In the end, we chose to put the filters at the top with the search results for two main reasons. First, by placing the filters at the top of the page, users are more likely to see it and therefore use it (this was validated in during the user testing of our high fidelity prototypes). Second, because the filters directly affects the search, we wanted to place it next to the search box to support this connection.

Trade-offs

There were a few trade-offs that exist with the final version of the filters. First, some users found it a little confusing to have the filters at the top when the filters change the tabbed results on the bottom of the page. This was not seen as a major issue since this did not cause any problems for the users and both the filters and results can be seen at once so it is fairly clear what is happening as the filters change.

The other trade-off we noticed is that users are not likely to use them before they search for a topic. The initial intent was to not only have them update the results live but also allow users to enter a search term, set the filters they want and then hit the search button. Because the search filters immediately change the current results, users would tend to search and then use the filters.

Mini-profile

Goal

Provide the users with enough information about each result in order to pick the best expert to ask.

Design and Rationale

The mini-profile provides information relative to the user's search in order to help the user decide who to contact. The person's name, position, communication availability, calendar status, experience and connection to the individual are all presented for the user. More details on each of these sections can be found below. User testing confirmed that these pieces of information were the most important parts that individuals needed in order to make the correct decision on who to contact about a particular topic.



Figure 12 – Paper prototype version of the mini profile

The position of the mini-profile on the search results page has shifted a number of times over the course of the design process. In the initial paper prototypes, the mini-profile was on the left part of the screen. One issue we encountered was that users were not associating the expertise browser with the search term. To try and remedy this situation, we placed the expertise browser underneath the search box and moved the mini-profile to the right part of the screen. We immediately received

negative feedback from both client and users about the new position of the mini-profile. Users expressed a need for the system to simply tell them who they should contact and then, if they wanted, have the ability to look through other results. By having the mini-profile on the top left, it will be one of the first things the users see (since English speakers read top to bottom, left to right).



Figure 13 – Mock-up of the search results page with the mini-profile on the right

For our final prototype, we moved the mini-profile back to the left side of the screen and separated the expertise browser from the mini-profile. This format was tested with nine users in our final round of user testing and no users had any issues with the final design.

Trade-offs

In an attempt to prevent the user from having to scroll down in order to see the search results, there is a limited amount of space on the mini-profile. As a result, not all of the individual's information can be displayed. Certain parts of the user's entire profile had to be picked to be displayed on the mini-profile. The goal was to display enough information so that the user could easily decide who to contact without having to access the individual's profile page. Without a great deal of additional user testing in the real world, it can not be proven that we have picked the optimal amount and type of information to display on the mini-profile.



Figure 14 – Final design of the mini-profile on the results page in the hi-fi prototype

Removed Feature: Ability to bookmark people

Goal

Allow users to save people they have previously found.

Design and Rationale



Figure 15 – Bookmarking a person by clicking on the star next to the name in the paper prototype

The idea of bookmarking a person came up during our initial brainstorming sessions that began the design phase of our system. In our paper prototypes, there was a star next to each individual's name, and the individual could be bookmarked by clicking on the star. The star would then turn from white to yellow to show the person had been successfully bookmarked. During the user testing of our paper prototypes, users had a great deal of difficulty figuring out how to bookmark a person (see Appendix M – Wireframes and Paper Prototypes). Based on their comments, it was concluded that not only did users have trouble figuring out how to bookmark an individual but the concept of bookmarking a person did not fit the user's mental model.

Although we dropped this feature after the paper prototype testing, there are two workarounds that still allow users to save individuals they find through the system. First, the users can use their corporate e-mail system to add the person to their contacts list. In addition, since the profile page is a web page, the user could use their internet browser to bookmark the page that contains the profile of the person.

Picture and name on mini-profile

Goal

Make the result more personable and possibly allow users to recognize the result

Design and Rationale

The name and picture are at the very top of the profile in order to serve as an introduction to the user. In case the user wants more information, both the name and picture link to the individual's profile. Although the picture and name have not gone through many rounds of iterations and redesigns, they have been backed up greatly by user data in all rounds of user testing. Many users have noted how they love being able to see a picture of the result in case they recognized the person but could not remember their name.

One minor feature that was cut from the final design of the system was the ability to see if a user was in a meeting or offline from the mini-profile picture. In the paper prototype and early high fidelity prototypes, a small red circle appeared in the bottom right corner of the image if the user was currently in a meeting, and a gray circle if the user was currently offline. Users had difficulty understanding the meaning of the red and gray circles so they were dropped in favor of other options. See the status bar section of the tabbed results (page 39) for more information.

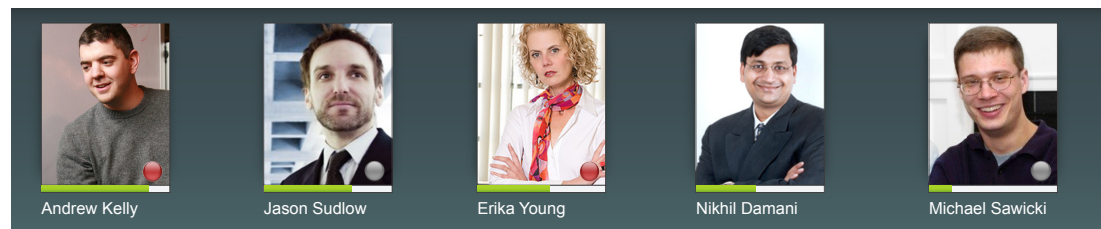


Figure 16 – Early design iteration of the results tabs with circle representing a person's status

Trade-offs

Including a picture may raise some privacy concerns with users who want to remain more private and not have their picture shown to everyone in the organization. If users are severely concerned about having their picture widely available, they may have the option to not have a picture associated with their profile.

Position and link to organizational chart on mini-profile

Goal

Allow users to see the position of the individual and their position in the hierarchy of the organization

Design and Rationale

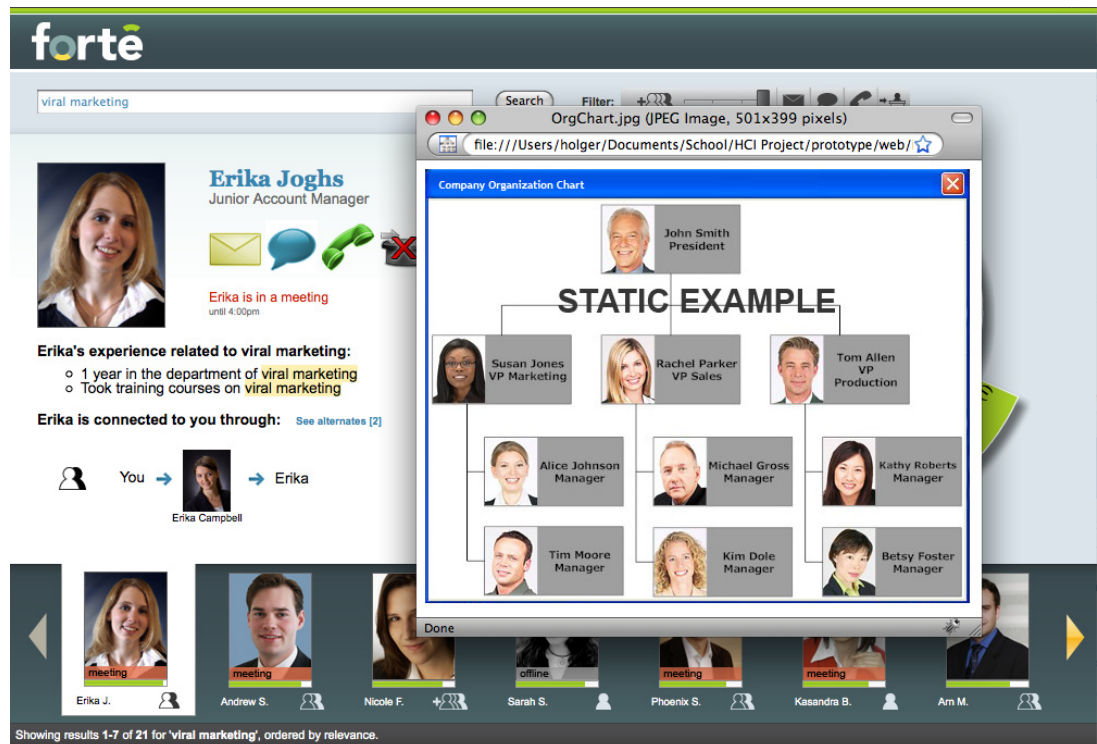


Figure 17 – Clicking on a person’s position brings up an organization chart

Directly below the name, is the individual’s position within the organization. Clicking on the position title brings up an organizational chart that shows the individuals position among the organization hierarchy. Many users expressed a need to see how high up in the organization the individual was. They claimed that they were less likely to contact someone higher up in the organization than them. This is also backed by literature, which says individuals are more likely to talk to peers than others ³⁷.

Trade-offs

Looking at the organization chart will tell the users if the individual is above or below them but it may take some time. While the organization chart provides many details the user may want, some users only wanted to know if the individual was above them or not. The ability to filter out individuals above you in the organization is an additional feature discussed later in the report (page 54).

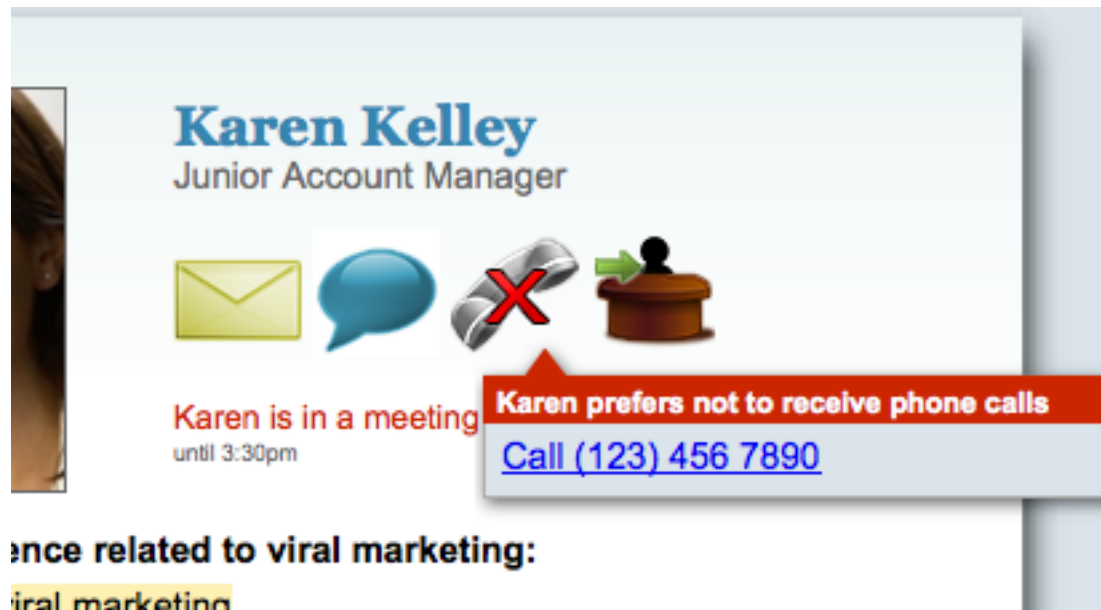
Communication availability

Goal

Allow users to see the communication availability of the individual and contact them if necessary.

Design and Rationale

The individual sets these icons (either enabled or disabled) in the widget and those settings then show up here. If the user decides to contact the individual they can click on each of the icons for more details. Clicking on the e-mail icon will bring up the individual's e-mail address, the instant messenger icon brings up their instant messenger screen name, the phone icon brings up their office phone number and the desk icon brings up a map showing the location of their office. The user can then click on the e-mail address, instant message screen name or telephone number to e-mail, instant message or call that person. If the individual has disabled a form of communication and the user clicks on it, the information will still be displayed but with a warning that the individual you are trying to contact does not wish to be contacted by that form of communication.



Change related to viral marketing:

Viral marketing

Figure 18 – When the user clicks on a communication icon, a popup displays their contact information. An alert is also displayed if the individual is unavailable for that communication mode

One significant change to this section was the addition of a popup showing the contact information. As previously described, clicking on one of the icons brings up a small popup that shows the contact information. In the paper and initial high fidelity prototypes, clicking on the icons immediately began contacting the person. If the e-mail icon were clicked, for example, then the corporate e-mail system

would be brought up with a blank e-mail address to the individual. This caused problems with users who only wanted to know the phone number of an individual but accidentally ended up calling them instead. The popup was added as an intermediary step to prevent the users from accidentally contacting the individual.

Additional information on the communication icons (including trade-offs) can be found in the 'System-Wide Designs' section on page 12.

Calendar status

See 'Status' in the 'System-wide Designs' section on page 11.

Experience related to search topic

Goal

Show the individual's knowledge related to the search topic

Design and Rationale

Both literature and user research showed that one very important part of how a user chooses who to contact is how qualified they are in the topic³⁸. By displaying how the individual is related to the search topic, the user is able to see how knowledgeable the individual is on the specific topic they searched for. This also allows the user to get an idea of why the individual was selected as a search result and how helpful they might be if the user contacts them.

In our user research we saw many users looking at this area very carefully when making their decision. There has been very little change to this part of the system since the first version of our paper prototypes. Users did show a need to draw more attention to this area and specifically the topic they searched for. In the final iteration of our prototype, we highlighted the search word when it appeared in this section.

Arn's experience related to viral marketing:

- o Currently taking training on viral marketing
- o Worked on a project related to viral marketing

Figure 19 – The current search term is highlighted when showing a person's experience on the mini profile

Trade-offs

There are no known trade-offs related to this section.

Connection to user

Goal

Allow users to quickly see how they are social connected to the individual.

Design and Rationale

This area of the mini-profile shows all the ways in which the user is connected to the individual. The shortest path is shown first with the ability to see alternate paths by clicking on the 'See alternates' link. The paths use both the pictures and names of the individuals to give the user a better understand of the individuals in the connection path. Clicking on the pictures in the path brings the user to the respective person's profile. To the left of each connection is an icon representing the number of degrees of separation in that path. In the preliminary designs of our system this icon was left out but users had difficulty learning what the degrees of separation icon meant. By adding the icon here, it enforces the meaning of the icon.

Lucius is connected to you through: [Hide alternates](#)



Figure 20 – Forté displays the many ways in which the user is connected to the individual

The degrees of separation between the user and another individual has a big impact which person the user decides to contact^{27,40}. Users showed a need to know not only how closely they knew the individual but also who they knew them through.

Trade-offs

Forté keeps track of the connections between individuals but there may also be informal connections that the system does not know about. Since Forté can only show connections that it knows of, there may be additional (and possibly shorter) paths that exist but are not captured in the system, and will never be shown to the user.

Tabbed results

Goal

Display the search results to the user with enough information to allow them to not have to click through every result.

Design and Rationale

The tabs are displayed at the bottom of the search results page with seven results displayed at a time. Each tab contains the picture, name, degrees of separation, relevance bar and status banner if the user is in a meeting or offline. There are arrows to the left and right of the tabs to get the next seven or previous seven results.

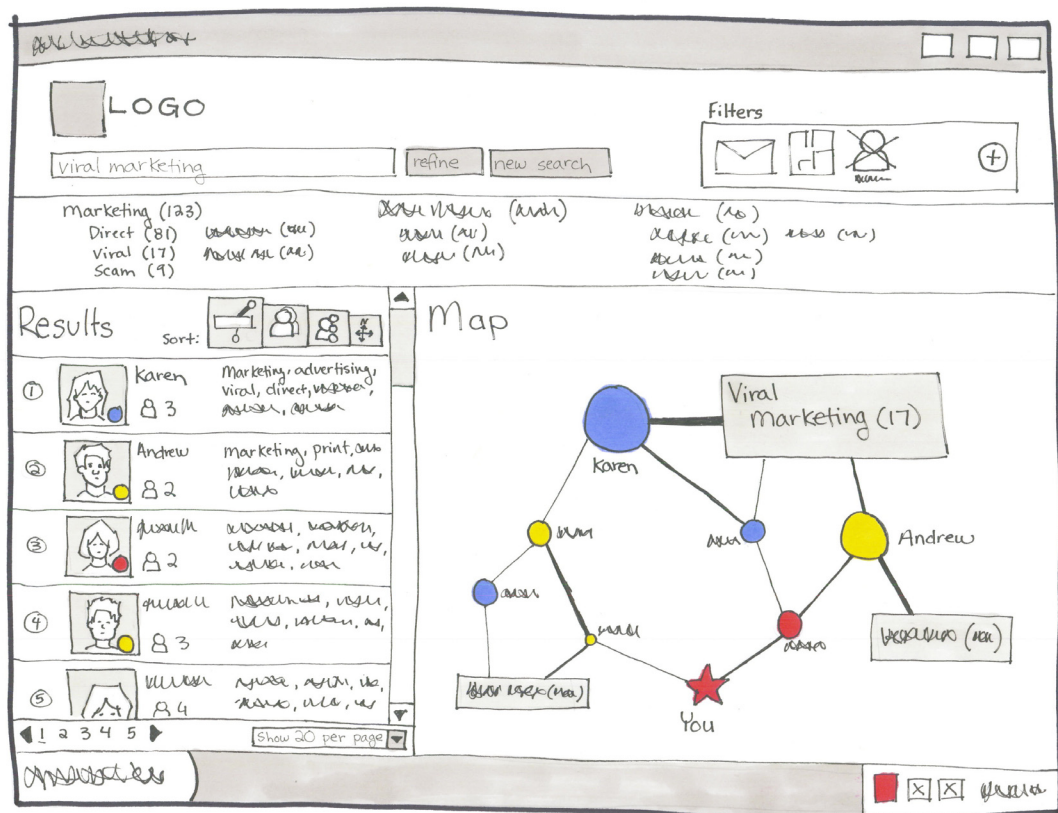


Figure 21 –Early wireframe of the search results page. Results were initially displayed as a list, rather than summarized in tabs

Much debate and testing went into how and where to display the search results. In the initial brainstorming session, a number of options were discussed. It was initially decided to try and display the results in a vertical manner. After a fair amount of discussion with our peers, the vertical list was simply not working. People noted that it was too crowded, the pictures were too small and there was not enough information to make a confident choice on who to contact.

The next round of designs involved tabs at the bottom of the screen with more information being displayed about the current result that is selected. As we began testing the tabs and discussing the new design with peers, it became clear that tabs were the best option. One of the primary reasons tabs work so well is because the picture is a very important part of the search result. The picture allows users to quickly identify people they might now or want to contact. In addition to including an image, we wanted to minimize the amount of space taken up by the search results. Since the primary focus is on the mini-profile and the details of the user, we wanted to devote most of the screen to that section and have the result tabs be less of a focus. By using tabs, we minimize the space that each result takes up while still supplying the user with enough basic information to know if they want to get more details about the individual.

The placement of the tabs was another issue that took a great deal of time. In the initial paper prototype, the tabs were placed at the bottom of the results section. During the user testing of the paper prototypes we noticed some issues that users had with the tab position. One user didn't even see the tabs at the bottom until the fifth task. In addition, we received feedback from our peers that the tab placement may not be optimal and to consider moving the results tabs to a different location. Versions of the system with the results on the top and side were created and briefly tested with users.

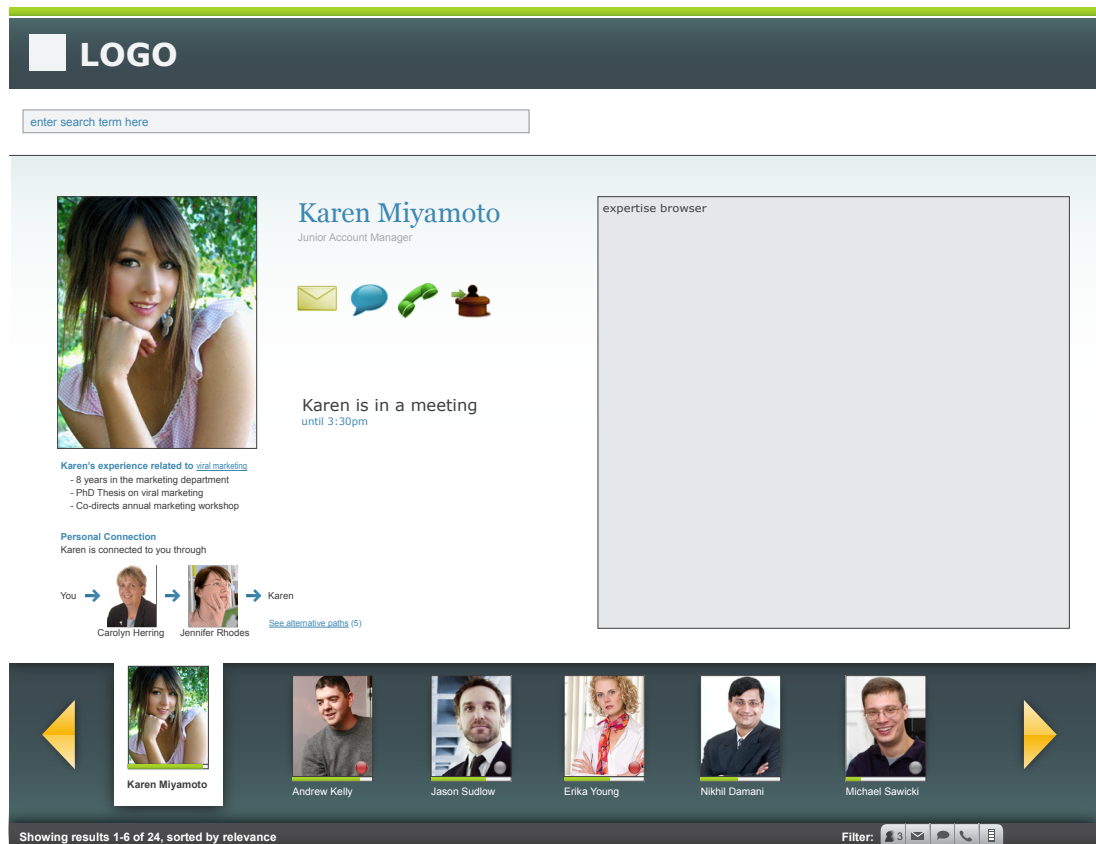


Figure 22 – Early hi-fi prototype, showing tabbed results at the bottom of the search results page

The results of user testing the different layouts were not promising. When the tabs were placed vertically, the tabs became too crowded and not as many results could be displayed. Moving the tabs to the top of the screen proved to be better, but even this layout had many issues. A number of users commented that the tabs got in the way of the mini-profile, which they wanted to see first. They wanted the system to present them with a person whom they should contact. Then, if they wanted, they could go on to look at other options. Placing the results at the top of the screen interfered with this line of thinking. In addition, the double picture problem discussed earlier was also an issue with this layout.

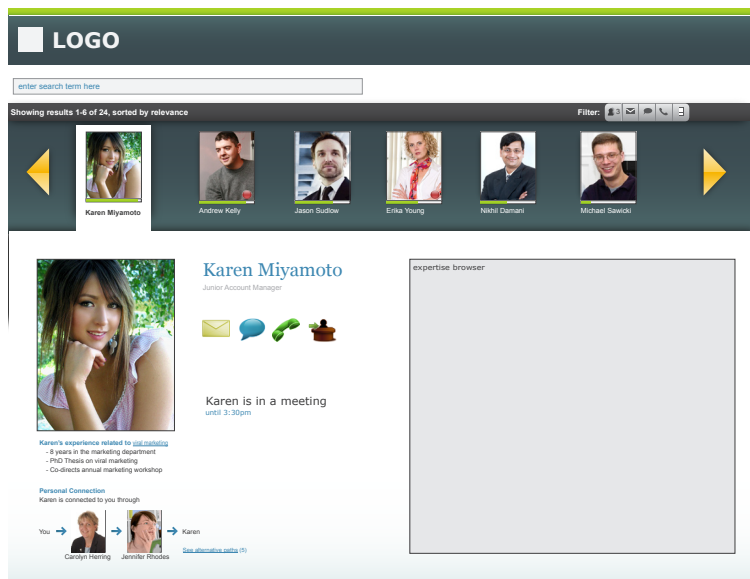


Figure 23 – Hi-fi prototypes showing different placements of the tabbed results

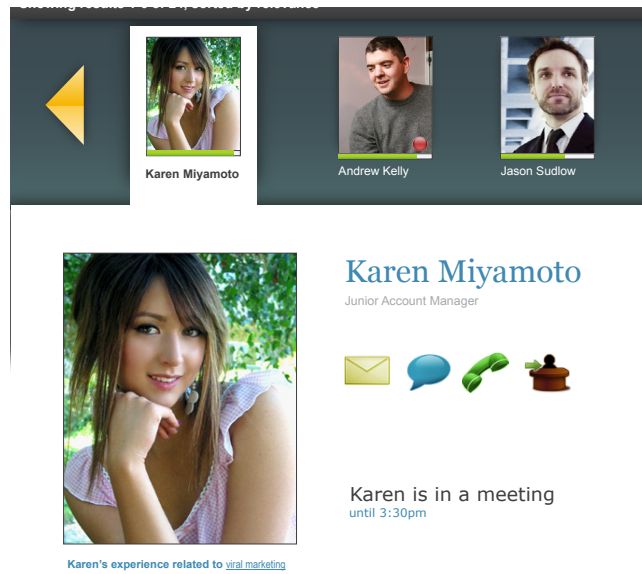


Figure 24 – Early mockup of the results at the top outlining the issue of having a double picture of a person

The results were moved back to the bottom of the page, where they remained throughout the final stages of our user testing. Users had no difficulty locating and using the tabbed results at the bottom of the screen, and many users commented on how much they liked the tabs.

Trade-offs

The tabbed results have had a great deal of positive feedback but there were a few users that were surprised by displaying the results as horizontal tabs at the bottom of the screen. It is possible that users may not immediately see the result tabs or not be sure how to interact with them since they are not a common practice. From the user interactions we witnessed, however, there were never any major issues with the tabbed results.

Picture and name on results tab

Goal

To allow the users to quickly identify results they may know

Design and Rationale

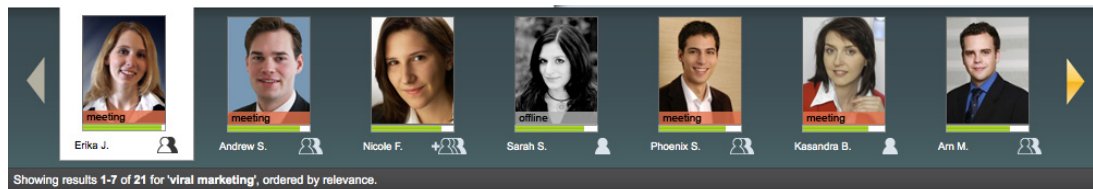


Figure 25 – Results tabs with the name and picture for each person matching the search query

The name and picture take up most of the space on the results tab. This is intended to give the user a quick introduction to the individual, helping the user decide whether or not they want to click on the individual for more information. Since our initial prototype, the design of the picture and name has stayed exactly the same. Users have commented about how they really like being able to see the pictures of the individuals in the results tab.

Trade-offs

Since the picture takes up so much space on the mini-profile, it limits the ability to put additional information on the tab. It is possible that there is a more optimal layout that involves either a smaller picture or removing the picture entirely.

Status bar (meetings/offline)

Goal

To quickly display if the individual is in a meeting or offline

Design and Rationale

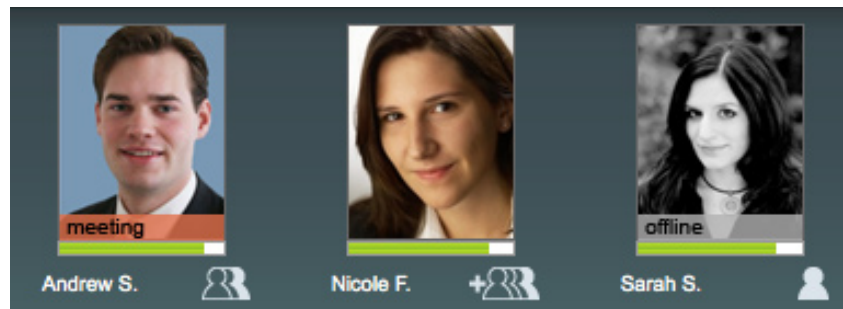


Figure 26 – Final design of people representation in the results tab with indication of status

If an individual is in a meeting, a translucent red banner appears at the bottom of their picture with the text, 'meeting'. If the user is offline and not logged into the system then a gray banner appears at the bottom of their image with the text, 'offline'.

Like the mini-profile picture, the current status was initially done with the help of gray and red dots (see page 28). Users did not understand what the dots meant, which made them useless. Since implementing the status bars, users have clearly understood what they meant and had no issues with them. Many users have used the banners to quickly skip over the people that were in meetings, saving them time they would have lost if they had to click on the result and look through their mini-profile.

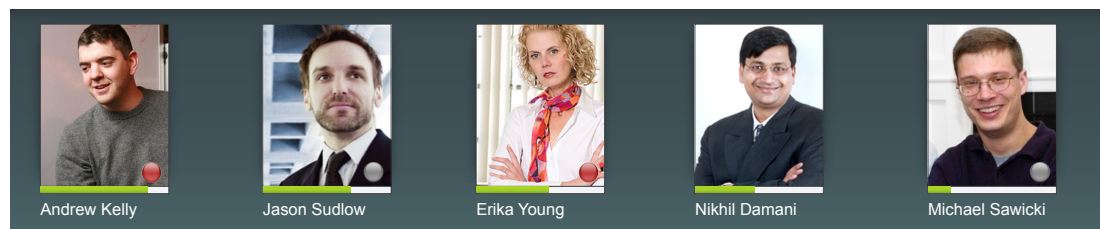


Figure 27 – Earlier design for status representation with gray and red dots

Trade-offs

Since there are only two forms of the status bar, they don't tell the user a lot about the individual result except that they are either in a meeting or offline. It may be possible to create more detailed status bars that inform the user more about the current status of the individual.

Relevance bar

Goal

Display to the user how relevant the individual is to the search topic

Design and Rationale

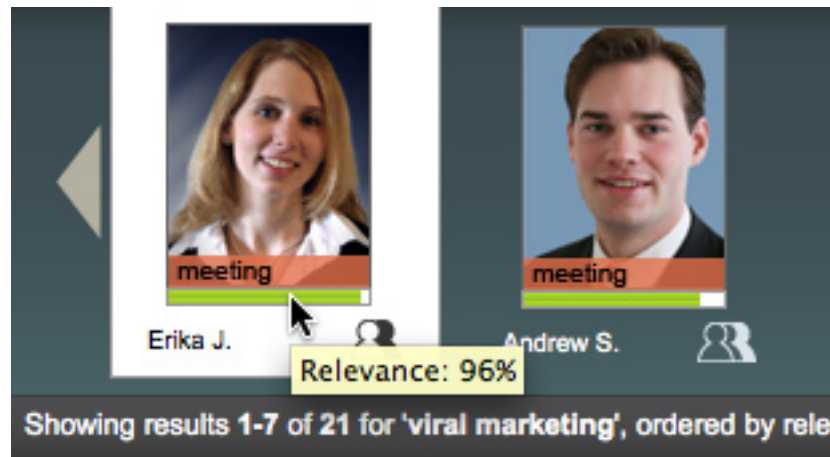


Figure 28 – Hovering over the relevance bar shows the actual relevance in percent of that search result

The relevance bar sits at the bottom of the individual's picture in the results tab. If the user is a perfect match then the bar will be completely filled with green. As the result becomes less and less of a match, the green portion shrinks in size. When the user hovers over the relevance bar, they get a numerical value for how well the result matched the search criteria.

In the initial brainstorming, it was agreed that there should be some sort of indication in the search results of how relevant the result is to the search topic. This allows users to quickly see if a result is only slightly related or very strongly related. The actual strength of the match will be determined by an algorithm which may or may not include not only the amount of knowledge the individual contains about the topic, but also how well the individual is related to the user. Many users expressed an interest in having people they know directly be weighted higher than those they don't know at all. While the actual algorithm is outside of the scope of this project, this is something to keep in mind for future development.

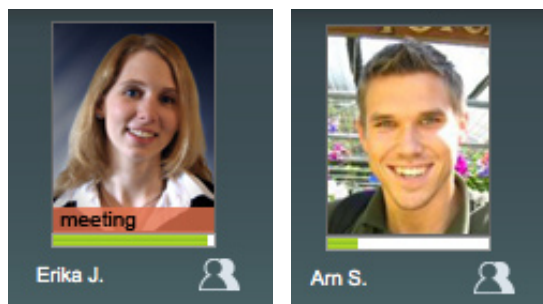


Figure 29 – Two results showing different levels of relevance – high relevance on the left, low relevance on the right

The only change to come out of the relevance bar is a tooltip that appears when the user hovers over the bar. (See Figure 28). The tooltip is designed to clear up any confusion the user might have about what the bar represents.

Trade-offs

While the relevance bar was successful in the last round of user testing, there were still some issues that were never worked out. Certain users did not see the relevance bar or simply skipped over it because they were not sure what it meant. Once they were informed of the meaning of the bar, the users noted that they would probably use it in the future to help them decide which results to click on and which to skip over.

Degrees of separation icon

Goal

To show the user the number of degrees of separation between them and the individual result.

Design and Rationale

In the bottom right corner of every result tab there is an icon representing the degrees of separation between that individual and the user. It is the same icon that appears in the mini-profile and the degrees of separation filter. By using the same icon in multiple places, the user should learn the meaning of the icon more quickly.

Additional information on the design of the degrees of separation icon can be found in the ‘System-Wide Designs’ section on page 14.

While there was still some slight confusion from users in our final round of testing, the persistent use of the degrees of separation icons in different areas of the system quickly cleared up any the confusion.

Trade-offs

As previously noted, the icons are still not clear to some users. A great deal of time was spent designing a set of icons that was both simple and easy to interpret. The current working versions of the degrees of separation icons are the most successful and allow most users to easily understand what they represent.

Scrolling arrows

Goal

Allow users to scroll through the results quickly

Design and Rationale

To the left and right of the search results lay arrows that allow the users to scroll through additional results. Each click of the arrow shows another seven results or shows the remaining results if there are less than seven left. If there are no more results in one direction the arrow becomes gray and is no longer interactive.

In our initial paper prototypes, the arrows scrolled through the results one at a time. This functionality remained into our first round of high fidelity prototype testing when we noticed users wanted to scroll through the results more quickly. Since they already had the ability to click on the results to select them, it was unnecessary to have the arrow only move one at a time.



Figure 30 – Enabled and disabled states of the arrow buttons for scrolling through the search results

The initial implementation of the faster scrolling involved seven new results to appear once the arrow was clicked. This was confusing to users because there was no sense of movement, seven new results just seemed to appear out of no where. To fix this issue, motion was added, which slides the results to the left or right depending on which arrow was clicked.

One final problem that existed was that when the arrows were click, the current result (the one that displayed in the mini-profile) would automatically update to one of the new results. This confused a number of users who only wanted to view the next set of results but didn't necessarily want to select any of them. This issues was easily fixed so that a new result is only selected when the user clicks on that result.

Trade-offs

The only negative comment that the scrolling results have received is that it can be a bit dizzying when scrolling through results. The speed of the tab movement was slowed down in an attempt to alleviate the dizzying effect.

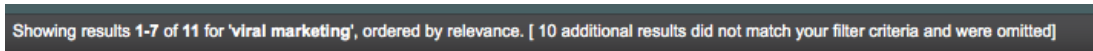
Footer

Goal

Clearly display the number of results, which results are currently being seen, the search topic, and the number of results that have been removed because of the filters.

Design and Rationale

The footer exists directly below the search results and displays the current results being shown, the total number of results, the search topic and any results that were left out because of the filters.



Showing results 1-7 of 11 for 'viral marketing', ordered by relevance. [10 additional results did not match your filter criteria and were omitted]

Figure 31 – Page footer showing the number of results and the amount of results that were filtered out

The first paper prototype did not have a footer and user testing quickly revealed that users wanted to know how many total results there were, and which ones they were currently looking at. Users also commented that they wanted to see the search term in the footer to confirm that the results they were viewing were about the topic they wanted. A footer was quickly added below the search results with the information users were requesting.

In the later rounds of user testing the high fidelity prototype, a number of users became confused when they expected more results than they saw. This was due to the fact that their filters had removed a number of results. To avoid any additional confusing, text was added to the footer when results were omitted by the filter criteria.

Trade-offs

The only known trade-off for the footer is that it is located so low on the screen that users may not see it, or think it is just a typical web page footer and contains irrelevant information.

PROFILE PAGE

forte

viral marketing Search Filter: +2

Erika Joghs
Junior Account Manager

advertising communication consulting
direct marketing events finance management
marketing online marketing people performance projects strategic teams viral marketing

Erika is in a meeting
until 4:00pm

	Mon	Tue	Wed	Thu	Fri
8					
9					
10					
11					
12					
1					
2					
3					
4					
5					

Projects

Project Number 1
Project description or details can go here. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec sit amet nisi at nulla sodales tincidunt. Vestibulum suscipit ligula sed risus. Duis elementum mi eget purus. Vestibulum justo. Suspendisse potenti. Aenean ac eros ut urna fermentum mattis. Pellentesque ac nisi. Phasellus ullamcorper sagittis sem.

Project Number 1
Project description or details can go here. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec sit amet nisi at nulla sodales tincidunt. Vestibulum suscipit ligula sed risus. Duis elementum mi eget purus. Vestibulum justo. Suspendisse potenti. Aenean ac eros ut urna fermentum mattis. Pellentesque ac nisi. Phasellus ullamcorper sagittis sem.

erika.joghs@company.com
ejoghs
(123) 456 7890
Building 5, floor 3, room 342

Figure 32 – More details about a person are available on their profile page

While the mini-profile provides the user with most of the information they would need in order to decide who to contact, the full profile page gives more details about the person. This lets the user be more confident about choosing the right person, as they can better see the context of the topic they are inquiring about with relation to the person's other areas of expertise.

This component of our system has not changed much over the course of the project, as we concentrated our efforts on the search results page, the visualization, and the desktop widget (where the user spends most of their time interacting with their system). Also, since the concept of the profile page is not a novel idea, we did not want to reinvent the wheel, but rather wanted to still include it in our system to demonstrate the role it plays in our design.

Tag cloud

Goal

Provide the user with an ‘at-a-glance’ view of the person’s knowledge areas and their relative proficiency in those areas.

Design and Rationale

The mini-profile gives the user information about how the person is knowledgeable about a particular search term, but does not convey what else the person is knowledgeable about. The tag cloud does the latter, and is valuable for the user because it might help them decide on a person who, for example, is knowledgeable about topics in common with the user, or is very knowledgeable in related subjects.

As it is a supplementary visualization, it is located on the right side of the profile page.

Trade-offs

Beyond conveying relative magnitudes, tag clouds provide little additional information and can take up screen real estate. However, since the goal here is to paint a quick picture of all the person’s areas of knowledge, the tag cloud suffices for this function.

Calendar

Goal

Assist the user in deciding good or better times to contact the person as well as convey the person’s general availability.

Design and Rationale

The mini-profile provides the user with the current status and availability of the person they might potentially contact, but not the person’s general availability. By providing a link to the person’s corporate calendar, the user can better decide whether this person might be too busy to answer their questions based on how busy their schedule looks.

In an office setting—especially in large companies—employees can set up appointments with other colleagues via an online calendar system, and so Forté leverages this information and provides it to the user. Similarly to the status message, a user can see the calendar at varying levels of detail, based on security and privacy settings as set by either the person, their team, or the company.

Trade-offs

Although calendar availability may be related to how likely a person will respond to the user, there is no guarantee that a person with a free schedule is willing to help the user. Conversely, a person with a very busy schedule might be very willing to help other colleagues through e-mail correspondence after office hours. Thus, some users might incorrectly judge a person's willingness to respond through the calendar.

Projects, teams, training, education, etc.

Goal

To present the user with all information about a person's areas of knowledge that the system has gathered and that has been approved by the person

Design and Rationale

While the tag cloud presents a quick snapshot of a person's areas of knowledge, the remainder of the profile presents detailed information about this knowledge, split into sections of how the knowledge was obtained. A person's past projects and teams within the company are listed in the profile page, particularly the areas of knowledge related to those projects and teams. Any training courses and formal education are also displayed. This information gives users more context about the person they will potentially contact, and, as with the tag cloud, lets the user be more confident about choosing the right person.

All this information serves as the source for the area in the mini-profile that highlights how a person is related to the user's search term (i.e. '[person]'s experience related to [search term]'). The system gathers this information primarily through data mining (see page 56) but also through direct employee input (e.g. uploading a resume to the system). This information would need to be approved by the employee in a separate section of the system (not implemented in our hi-fi prototype), such that no information appears on a person's profile page unless it has been approved.

Trade-offs

As this section of the profile page serves a dual purpose of 1) letting users know what the system is displaying about them to other users, and 2) presenting users with detailed information about the areas of knowledge of other users, it is not customized to helping the user achieve their main intent of finding a person knowledgeable about a specific topic. Thus, it serves a supplementary albeit important purpose.

VISUALIZATION

The expertise browser is a visualization of the hierarchy of expertise topics related to what the user is currently searching for. It is displayed on the right of the search results page, next to the mini-profile and above the list of people matching the search query.

Goal

Aid users in finding a knowledgeable person in a certain topic by allowing them to browse topics related to the current search term in a hierarchy.

Design & Rationale

The expertise browser shows a hierarchy of three levels: the current topic highlighted in the middle ring, its siblings left and right of it on the same ring, its children on the outer ring below it and its encompassing parent topic in the inner circle. Clicking on a child of the currently selected topic makes that child the current topic and moves it up to the middle ring together with its siblings. Once the child topic has moved to the middle ring, its children are displayed as well. Clicking on a sibling of the current topic rotates the middle ring so the topic that was clicked becomes centered as the new current topic. The outer ring then displays the current topic's children. Clicking on the circle in the center moves the parent topic down as the current topic and updates the hierarchy with the siblings and children of that topic. Each topic label includes the number of people who are associated with that topic.



Figure 33 – Final design of the expertise browser with ‘viral marketing’ selected as the current topic

One of the design challenges given to us by our client at first was to explore how semantic mapping can help employees to find information and connect to coworkers. First iterations of our paper prototypes included fairly complex semantic maps, which showed how people within the enterprise are connected to other people, projects and other information concepts. However, initial validations with wireframes showed that the level of detail of such visualizations are too complex for the tasks at hand and do not offer substantial benefit when finding a knowledgeable person (see Appendix M – Wireframes and Paper Prototypes). Therefore we shifted our focus from visualizing the entire information space to just showing how a certain knowledge topic is related to other topics in a hierarchical way and linking these topics to people within the company.

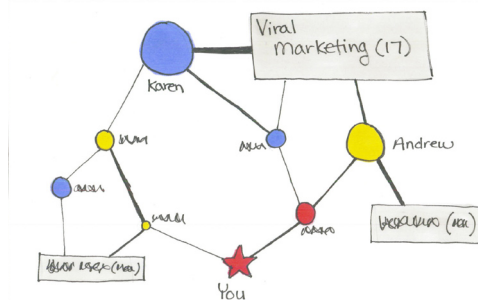


Figure 34 – Early wireframe showing a semantic map of how people are connected to expertise

The expertise browser directly addresses the first step of the knowledge retrieval model, which came out of our needs validation process (see Appendix K – Scenarios and Needs Validation) – determining what the user is looking for. The idea behind the expertise browser in addressing this need is to offer users an alternative to purely searching for someone knowledgeable in a certain topic. The problem with direct queries and exactly specifying the area of expertise is that often times, users are not fully certain as to what exactly they are looking for. Furthermore, since the user is actively looking for knowledge in an area that they have little information on (hence the search for someone knowledgeable), they may be unfamiliar with the terminology used by experts on a specific topic. Additionally, there may only be a limited number of people knowledgeable in the area that the user searched for, but a similar area may have more people which could be just as helpful with the user's initial topic. Therefore, the expertise browser allows users to search for a term, which they believe matches what they are looking for most closely and can then refine or revise their search based on the hierarchy of information present in the company.

The rationale behind visualizing the hierarchy in a circular fashion rather than as a tree, which is a more straightforward concept for hierarchies, is that during initial paper prototype tests, users tended to confuse expertise displayed as a tree with the an organization chart of the company. In these initial tests, users dismissed the tree as irrelevant to their task of finding a knowledgeable person in a specific area and would not take advantage of the browsing benefits it offers. In contrast to this, the circular display is a novel display for this kind of information and as such spurs curiosity within users and invites interaction.

From our paper prototype user tests with millennial users, we discovered that while the static paper version of the expertise browser fairly sufficiently communicated its hierarchical notion, some users struggled with understanding the relations between the inner circle, middle and outer ring (see Appendix M – Wireframes and Paper Prototypes). Therefore, we established that we needed to add a better way to communicate how the expertise browser should work. For the high fidelity prototype, we used subtle animation cues between different states throughout the expertise browser to aid the user in understanding the hierarchy as well as to further invite interactions with this element of the search page. Topics transition smoothly between the different levels of hierarchy so that the user is aware of where the topic, which was clicked on, moves to and where other topics are moving. This is important since due to the novel nature of this visualization, it is necessary to convey appropriately what the result of the user's actions are in order to aid the successful creation of a suitable mental model.

Additionally, indicating the amount of people related to a specific topic together with the topic labels provides a feed-forward method by suggesting how many results the user will get if that topic is clicked on.

During our high fidelity prototype user testing, we continuously fine-tuned the animations for the expertise browser in order make them slow enough to be understandable even by novice users while not slowing down users already familiar with the interactions of the expertise browser. We also added additional animations to convey the current state of the browser since some of our participants tried to click the currently selected topic and were discouraged from interacting with the browser further since nothing happened. To avoid this, we added a short pulsating animation to the current topic's child topics to indicate that the child topics relate to the currently selected topic.

Trade-offs

While the expertise browser adds a novel navigation technique to our design, it may also confuse users who have never seen it before. Due to its placement on the right side of the screen and its usage of animations, some users may confuse it with advertisements, which are often placed in similar spaces on public websites and due to ad-blindness, may be ignored by users. We observed this behavior initially with some of our participants, even though these users still used the browser in the specific user testing tasks where it was required.

For very large topic spaces, the current design of the expertise browser may suffer from scalability problems as only so many topics can fit on the middle and outer rings. Navigating deep hierarchies may also result in users getting lost at some level and having difficulties navigating back to the original topic they started out from, since only three hierarchy levels are visible at one time. To offset this problem, we added a back link to the original topic which appears when the user switches to a different topic. Another option for preventing this problem would be to extend the expertise browser to display more than just three hierarchy levels. However, we saw from our user testing that three levels are usually sufficient for identifying related topics and adding more would not only add to the visual complexity of the browser but would also lead to increased panning and scrolling of the visualization since it becomes less likely that the entire hierarchy would still fit in the results page.

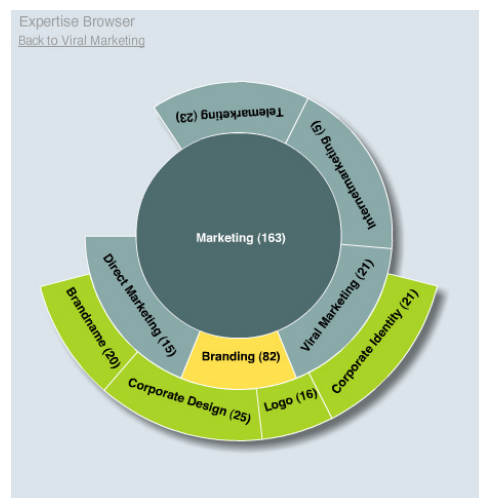


Figure 35 – Expertise browser with back link to ‘viral marketing’

conclusion

In our introduction, we described the Project Overview Statement (see page 4) that we drafted in order to set bounds for our user research and guide our design efforts. Although we decided during our scope refinement sessions at the beginning of the summer semester to focus on our fourth objective (knowledge sharing), we successfully managed to meet all of the objectives, as described below.

1. Discover the unique factors that millennials need to be successful in the workforce

The following table summarizes which needs (see Appendix H – User Needs Distilled from Data) of millennial workers are being addressed by our system. While this list excludes some needs that we identified during our scope refinement sessions, we believe this is more advantageous for the product. Trying to address too many issues in one solution can detract from the main intent of facilitating knowledge sharing between employees.

MILLENNIAL NEEDS ADDRESSED BY FORTÉ

- Understand co-workers' formal roles, titles, responsibilities, and reporting relationships
- Understand the informal hierarchy of age and experience
- The location and age of people that could provide knowledge
- Trusted co-workers who can answer my "stupid questions"
- To be independent regarding asking questions
- Receive training course information and recommendations
- Build network within the company
- Learn about co-workers' skills
- Know co-workers' status and availability
- The ability to show/hide certain information from co-workers
- Communicate informally
- Communicate efficiently

2. Understand how to motivate talent among the Millennial Generation in order to change current talent management systems to support the greater intent of millennials in developing their own skills

Our background research and user research have shown that current talent management and knowledge management systems are not being utilized by employees to their fullest potential. We found that this is due to these tools being designed primarily as extensions of tools for HR, rather than individualized tools for the employee. Furthermore, these tools are not easily accessible and as a result, suffer from low visibility. Forté overcomes both of these issues by being designed primarily as a tool for the millennial worker, which is readily accessible through the desktop widget.

3. Determine how internal social networking addresses the needs of the millennial employees and consider how a social tool can be used by both HR and managers to find and attract talent, staff projects with the right people and keep them happy and efficient at work

Internal social networking tools allow employees to find out information about other employees at their fingertips, without bothering other people. This information is usually related to employees' daily work, but can also include personal information. This information is extremely beneficial for the millennial worker as it not only gives them access to knowledgeable people in the company that could potentially assist them in their work, but also allows them to build not only professional but also social connections within the company.

One advantage that Forté has over other corporate social networks is that the burden of having to enter information is minimized. While not directly a tool for managers and HR, Forté keeps track of employee expertise—over time, managers and HR can keep track of how an employee's expertise has changed. Also, HR and managers can take into account an employee's activity on the system when considering monetary (or other) rewards.

4. Leverage millennials' propensity for using technology and their sense of community to encourage collaboration and exchange of corporate knowledge

Forté provides employees with a digital alternative to 'turning around to your office-mate to ask for help' by effectively making all employees in the company your office-mates. It facilitates learning about other employees and what they offer to the office community with a focus on the skills they bring to the table. This helps to foster a sense of teamwork even between employees in the company that are not within the same team.

Forté recognizes that millennials already use a multitude of social networks outside the company setting, and does not attempt to replicate the features of those systems. Rather, our system makes use of the visual style and interaction techniques used by those systems (as well as other Internet applications) that millennials are accustomed to.

Forté also takes advantage of the fact that millennial workers tend not to make use of knowledge repositories but instead rely on communicating informally and effectively with other employees. It incorporates not only the traditional methods of communication (phone, face-to-face) but also allows for e-mails and IMs, both of which have almost unanimously become accepted forms of office communication, particularly for millennials.

MEETING THE PROJECT GOAL

As described in our Project Overview Statement, our goal for the project was to “Create a social tool which enables companies to effectively attract and engage the next generation of workers by connecting people, places and resources within the enterprise to optimize the way work gets done and knowledge is shared.”

By meeting all the objectives, we have successfully accomplished our project goal: Forté is a social tool that connects people within the enterprise to the resources they need to get their work done through the sharing of corporate and individual knowledge. This helps keep millennials engaged by allowing them to feel more connected to others within the company that they don't necessarily interact with on a daily basis. Our tool also helps attract talent by conveying to potential employees that the company fosters and cares about collaboration within the company. As such, we believe that our tool will add great value to our client's product lineup, and will help further distinguish themselves from their competitors.

future directions

ADDITIONAL FEATURES

While we have managed to integrate a concise set of inter-connected features into our final design, there are still many interesting areas for future development of our concept.

Even though we have touched on many areas of corporate social networks, we also have decided not to focus on replicating most of the existing systems on the market today. Nevertheless, our system, in its current form, would still integrate nicely with a company's existing corporate social network and would add a significant productivity value by leveraging the existing data for knowledge sharing tasks. We already use people's profile pages for offering more detailed information on who to contact regarding a specific knowledge area. While we have specifically designed the functionality of a profile page for our system, the same data that was used could also come from an existing social network. Both systems would benefit from the integration since our knowledge sharing system can leverage the existing data on people and their connections while the social network benefits from an advanced search interface for finding knowledge and people.

For our system itself, an important addition would be improved predictions and disambiguation for what kind of information the user is looking for. Currently, we support searching for expertise and people. But users may also want to search for specific projects people have worked on or teams which work in a specific area. At present, our system does not address these areas since we concentrated on designing a compelling search for knowledgeable people. Nevertheless, the system could be extended to address these areas as well as combinations of different search terms. It is important to note, that when searching for other kinds of information than people, the expertise browser needs to be replaced by a different visualization. It does not make much sense to display the expertise browser for a specific area of expertise if the user searched for a person, since there will be a great diversity of expertise. When searching for projects or teams, it may still make sense to display a similar hierarchy of topics but now related to the project or team respectively.

Some of our participants in both low and high fidelity prototype user tests mentioned that they would like to have the option of filtering by whether a person is higher up than them in the company hierarchy since they said that they did not want to talk to a senior manager about questions related to their work (see Appendix F – Consolidated CI Models). There is also more general evidence that people prefer to ask questions to people who are on their same hierarchical level³⁸. Another possible filter option would be to discard all results for people who are in a meeting, as indicated by their current status according to their corporate calendar. All these additional filters could be located together with the existing filters, even though this comes at the cost of increased screen and filter configuration complexity.

Alongside being able to filter according to people's position within the company hierarchy, being able to see who in the path of personal connections is above or below someone would also be beneficial since it may affect the decision of which path to take.

It was mentioned previously in the description of the expertise browser that scalability might become an issue in real-world implementations of the system as the topic space grows or even if a topic has many siblings which do not all fit on the ring. One solution that would address this problem is to add the ability to scroll through siblings on the ring. This can be done by adding scroll arrows to either end of the ring, which can then be used to scroll back and forth through the sibling topics of that ring. This is only one possible solution to the scalability issue of the expertise browser, which may not be the ideal solution since it also introduces visibility problems with sibling topics, which are scrolled away and thus are not visible on the screen.



Figure 36 – A mockup of the visualization with scalability in mind

During our user tests and critiques, concerns were voiced on whether the first result for a certain topic would always be the same person and if that person would be bothered by too many questions. While the real effect of this can only be truly estimated in a field test with a fully working product and within a real company setting, it is possible to mitigate an issue like this within the system itself. For example, users could either add information about frequently asked questions to their profile or even let other people add information like that to their profile in a wiki-like manner. This would potentially help experts on a topic to avoid repeatedly answering the same questions. Additional information can be found in the potential issues section on page 56.

Based on the feedback we got from users, it would be nice to expand the recent searches functionality within the widget to allow for tracking who a user contacted and what the context of the interaction was. This could serve as a list of possible go-to persons and help with identifying who the user can ask in the future.

It would also be beneficial for people who help others through the system a lot to let their managers know that they are supporting the company by sharing knowledge. While tying this to an employee's general performance and rewards is a company policy decision, it could certainly help as an additional measure of how well an employee is doing during performance reviews. At the least, it may help in making employees feel more appreciated for the help they are giving to others.

A feature, which is slightly removed from the general functionality of the current system, would be to enable the system to better predict a person's current status and infer their availability based on what they are currently doing, essentially removing the need for people to set their own communication preferences in the widget. While a fair amount of academic research has been done in this area, for example by extensively using sensors in the office ³⁵, it does not seem to be very likely that these solutions are going to reach mainstream production anytime soon, even when disregarding the privacy implications.

Given the increase in smart phones and general tendency of millennials to readily adapt new technology and gadgets, having a mobile interface for the system would be an interesting future direction to take since being able to find people would be very helpful for the millennial worker on the go.

POTENTIAL ISSUES

Populating the system with accurate data

One important aspect we have learned from our background and user research in the spring was that it is extremely difficult to provide accurate and up to date data on people's expertise if a system only relies on having people input the information about their expertise themselves. From our background research on knowledge management systems we found that adaptation of such systems is good if a company offers their employees incentives to use the system (see Research Findings Report, pg 15). However, once these incentives are no longer present, usage of the system may decrease substantially. Furthermore, during our contextual inquiries, we discovered that even millennials find that it takes too much time to keep information in social network profiles up to date (see Appendix F – Consolidated CI Models). In systems like these, which purely rely on user-generated content, it is also evident that users only bother to publish information they either feel very proud of or which

distinguishes them from others, as we have discovered from our background research. Unfortunately, this information does not necessarily reflect what people are most knowledgeable about or even what they spend most of their company time on. However, this is exactly the kind of information, which makes our system useful especially to new hires in the company.

For these reasons, our system needs to rely on additional means to gather data on people's expertise. One such approach would be to employ data mining techniques such as document classification, which examines word counts and even grammatical structure of documents to extract important features. A very good resource of information about people's expertise and the topics they are working on is their communication within the company – for example, to who do they write e-mails and about what, who attends meetings with who and on what or who talks to whom on the phone. This data can be utilized to form the connection paths, which our system uses to display who knows who within the company. The actual information about people in this data is already in a machine-readable format in the form of e-mail addresses and phone numbers. A data mining approach would extract distinctive words from e-mails, for example, which can then be used as keywords to tag people. These tags are then displayed in a person's profile page and can thus be used to find expertise using our system. Comparing these keywords with keywords from other people and clustering them according to which keywords commonly appear together with other keywords can then be used to form the kind of hierarchical structure that is displayed in the expertise browser.

While the data mining approach may sound like a fairly advanced way of gathering data for our system, document classification is by now a fairly well established topic in machine learning and algorithms, which achieve reasonable accuracy, are readily available ³⁶.

The technical issue with this would be that just gathering descriptive keywords essentially removes context from the expertise representation and as such, the keyword 'viral marketing' alone is less useful to someone looking for a knowledgeable person than the richer information that someone worked on a project related to 'viral marketing'. The fact that context is important when determining who would be a suitable person to contact was consistently confirmed during our user tests.

The more obvious concern with a data mining approach is protecting the privacy of the individual employees. Some employees may not wish to publish information on what they are working on even to a company-internal social networking platform. Despite these privacy concerns, we found out from some of our participants who work in large corporations, that it is often an established practice that managers monitor their subordinate's outgoing e-mails. The issue of privacy is further explored in the Privacy section below.

For the purposes of our system, however, it may be a better solution to supplement user-generated content in the form of profile pages with solutions to easily upload one's resume as well as a user-supervised data mining approach, which would only be conducted locally on a user's computer and allow them to select which keywords get published and which do not. This way, whenever the data mining agent which monitors a user's corporate e-mail activity determines that a new keyword has been established for the user (for example when that user has started to work on a new project), the system may propose a list of new keywords to add to the person's tag cloud on their profile.

In addition to populating the system with data about the knowledge of each employee, the expertise browser also needs to be populated with a hierarchy of expertise categories. Thankfully, a majority of this work has already been accomplished, mostly notably by the library of congress. The library of congress has its own classification, system which is extremely detailed and updated on a regular basis. One of the members of our team created a system which utilized the hierarchy of categories in the library of congress classification system in order to classify an individual's expertise. The expertise browser may also want to include additional categories that are specific to the company and not found in the library of congress's classification system.

An example use case for this approach would be that Karen, one of our primary personas, was recently assigned to work on a viral marketing project. Since the last week, she has been continuously preparing documents, which include the keyword 'viral marketing' and sent e-mails back and forth with other people mentioning the project, including attached documents about it. In the background, the data mining application running on her computer has been analyzing the documents and e-mails and after a few days proposes to add 'viral marketing' as a new tag to her project. The client software may even suggest putting the tag up together with the people that she has been exchanging documents about viral marketing with, thus adding new contacts to her connections. Karen can then specifically approve the new tag and the context that it appears in. The addition of a new tag may also prompt her to add more descriptive information to her profile page, such as what the new project that she is working on is about. Once she approves the new tag with a simple confirmation, 'viral marketing' is automatically added to her profile.

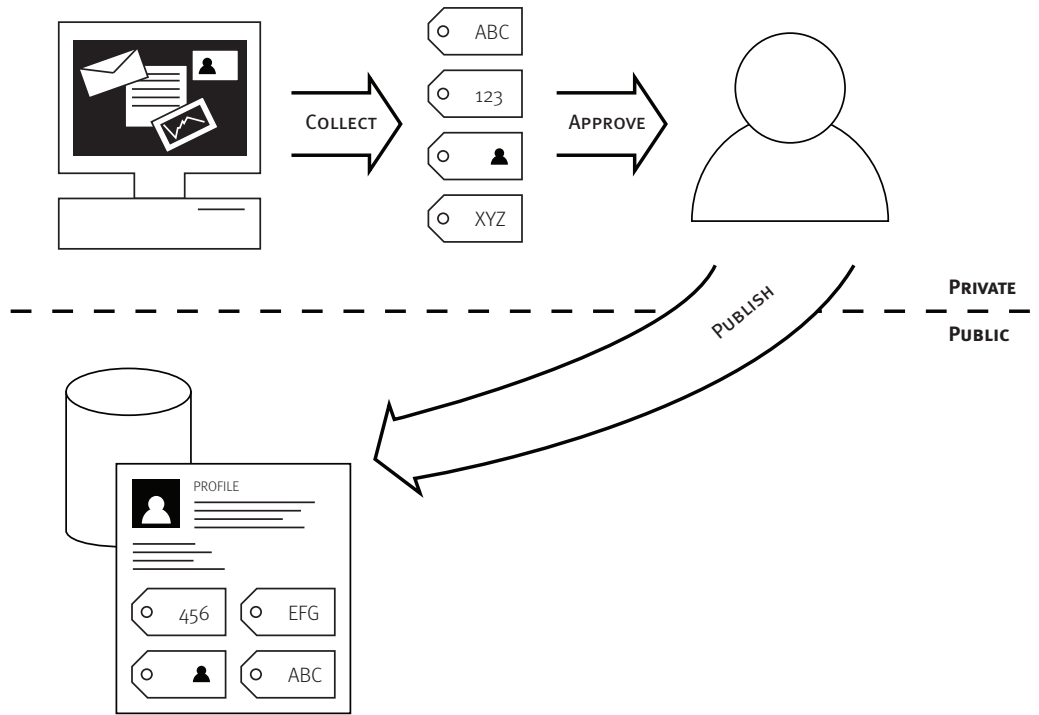


Figure 37 – A schematic diagram illustrating how data gets into the system

Privacy

In any system where individual information is being shared with others, privacy becomes a primary concern for some. Our system is no different as few users have voiced concerns over the control that they have over who sees what, and what personal information is shared.

Our system would be storing a great deal of personal data, but not much more than is already stored in most directories. Standard information like name and contact information is already widely available in most company directories so our system would not be introducing anything new here. The picture and all of the ‘knowledge’ that each user has would be additional information that most company directories do not store. Users did not have any problem with the system storing this information but they wanted to have control over exactly who sees it. Like other social networks, privacy settings could be implemented to only show your information to people you are directly connected to or only two degrees of separation from. This would be easy to implement and should calm most of the concerns that our users voiced about privacy.

One additional concern came up when it was mentioned that the system would mine e-mails to see who is talking to whom and about what. At first many users were taken aback and did not like the idea that the system would read their e-mails. After some explanation, however, they seemed to be more accepting. Our system would only be scanning e-mails to see which people are communicating with each other and what they are talking about. If the subject of the e-mail doesn’t match any knowledge topic in the system than it is discarded. In addition, most companies already employ some form of e-mail sniffing to make sure employee e-mails are appropriate. One user we talked with noted that 10% of her e-mails are automatically forwarded to her boss. The process is random so she never knows which e-mails will be sent to her boss. Other companies scan e-mail for specific words like ‘insider trading’ and forward those e-mails on to managers if discovered. Since there is such a great deal of e-mail scanning already in the corporate world, it does not seem like a major issue to employ a much less invasive form of it in our system.

Top result always the same

One problem that has come up multiple times in both general discussion and user testing is what happens if one person is bombarded with questions because they show up as the most knowledgeable person on a popular topic. If this were to occur, their productivity could be severely limited and frustrations could build until they simply stop using the system. There are a number of possible solutions to this problem that could be easily implemented.

The algorithm that determines how relevant a search result is, was discussed earlier (see page 40). It was noted that the algorithm could incorporate how similar the result is to the user or how closely related, socially, the result is to the user. The rationale behind this being that the user is more likely to talk to someone they know directly or that they are peers with than someone far above them or someone they don’t know at all. By incorporating these features that are unique to each individual user, the first result should not be the same for everyone, greatly reducing this problem.

Another possible solution is to allow the users to edit their ‘knowledge’ in the system. For example, if the system said Jason has taken five training classes on ‘viral marketing,’ he could potentially edit that down or remove it completely. If Jason did not want to be contacted at all about viral marketing, either because he was tired of answering questions or he wasn’t as knowledgeable as the system thought, he could edit his knowledge on viral marketing in the system.

Unfortunately, implementing this solution comes with a number of drawbacks. If users are allowed to edit their own knowledge the system may, in time, become wildly inaccurate. In addition, if users are allowed to remove knowledge from the system, does that mean they can also add knowledge? Can Jason just tell the system that he took five training classes in ‘viral marketing’ when he has only taken two? These questions would need to be examined if this solution were to be implemented in the future.

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I want to make my own hours

- Lunch hours
- Millennials like flexible hours
- Start time at work
- 'Sick' days / vacation time
- Working overtime
- Working during weekends
- Expect relaxed work schedule
- Hours

I don't want a strict working environment

- Benefits
- I value access to personal e-mails at work
- Prefer casual dress
- What perks attract millennials to jobs
- What attracts them to certain jobs?
- What jobs are retaining millennials?

My company needs me, they should make an effort to retain me

- "Job" vs. "Career"
- Expect more \$
- Expect to be promoted early and often
- What does the job do for the career vs. what does the person do for the job?
- What personal goals do millennials have for their career?
- Expected length of time at company (months? years?)
- What do millennials expect in a job?
- Expectations from first job out of college
- Loyalty to company values?
- Loyal to themselves, not to the job
- Work ethic
- What's their opinion towards job?
- How do you prevent millennials from changing jobs?
- What is important when finding a job?

I want to be friends with co-workers

- Millennials expect to make friends with co-workers more so than past generations
- Want to make friends at work
- Colleagues are friends

I like working in groups

- like to work in groups
- positive attitude towards teamwork
- work well in groups
- How do they interact with each other?

I'm comfortable letting people know about my social life

are more transparent than other groups
Does social networking lose some of its appeal when you don't maintain a 2nd personal for millennials?
millennials are more OK with their social life being transparent
less concerned about privacy
(anonymous) blog-writing about company
What is the value of social tools to the millennial generation?
Why are some tools considered to be cool? Why not?

I have a social life

What are their interests (hobbies)?
What do millennials do with their free time?
social life comes before work

My life/world is different from my parents

How do millennials convince other generations of having their way?
What are millennials view of Gen Xers?
Relation between Gen Y and Gen X
How are conflicts considering different life + work styles between Gen X + millennials resolved?
What are millennials view of baby boomers?
What is the society's view of Gen X?
Vs Gen X (differences/similarities)?

We like to do lots of things simultaneously

What do millennials lose when they multi-task? (reduced/increased productivity?)
are great multi-taskers
millennials typically like to multi-task
Good @ multitasking
What are the real differences in time management (casual schedule, multitasking...)?
What is the typical millennials "attention span"?

My family will always take care of me

Coddled too much
Coddled by their parents
Parent-children relation
Do millennials really rely on their parents as much?
most likely have baby boomer parents
had parents that were overprotective
are close with their families

I don't like people telling me what to do!?!

Casual attitude towards work and relationships
amount of supervision from boss
Encouraging manager and not "bossing"
Attitudes towards supervisors (bosses vs. partners)

How do millennials deal with structure, rules?
Distrusting upper management
think hierarchy is old-fashioned
Do millennials tend to “challenge” or “accept” authority?
Bad with authority
are defiant of authority

Tell me I'm good

I can always rely on technology

How technology influence them?
assume they will have access to technology
tech savvy
very comfortable with technology
impatient with technology (want everything to work fast)
Technology is taken for granted
Connecting to work (e.g. attitudes to Blackberries)
grew up with technology

Personality

value individuality
overachievers
their value, hope fear, desire
want to make an impact
want to get involved
want to have their voice heard
love to express themselves
what motivates millennials?
are focused on education
crave constant feedback
personality traits?
innovative
feel pressure to excel
what is their psychological traits?
special attitudes of Gen Y
are impatient and want it all right now
feel entitled

Formation of Gen Y

Why they emerge as Gen Y
The underlying social change
Important history events from the Gen Y (Factors from Gen Y)
grew up with diversity
What is the structure of Gen Y
Is Gen Y global

Pet questions

- How do they see themselves?
- Preferred communication mediums
- Millennials and work force
- What is Gen Y's biggest problem?
- Definition of millennials
- Pre-work backgrounds? (e.g. college, high-school, sports, grades)
- What fields are they going into?

High-level groupings

- Formation of Gen Y
- My life/world is different from my parents
- We like to do lots of things simultaneously
- I can always rely on technology
- I like working in groups
- I wanna be friends with co-workers
- My company needs me, they should make the effort to retain me
- Hear me now!
- I don't like people telling me what to do
- I _have_ a social life
- Tell me I'm good
- My family will always take care of me
- I wanna make my own hours
- I don't want a strict working environment
- I'm comfortable letting people know about my social life

Millennials Focus Statement

In the kick-off meeting we held with our client at the beginning of this project, we included a focus-setting session in order to come up with a focus statement to guide us in our research on millennials in the workforce. The focus statement which came out of this session is as follows:

How do millennials' sense of self-entitlement and reliance on technology affect how they interact with people?

Using this focus statement as a starting point, we began to conduct background research, which is described in detail in the following section.

APPENDIX B

Interview with a user of a Knowledge Management System/Corporate Social Networking Tool

Please briefly describe your role at your company.

I was a project manager for two projects [at IBM] developing and testing software that manages virtualized servers:
(<http://www-03.ibm.com/systems/management/director/extensions/vm.html>).

Briefly describe the social networking tool, e.g. name, when it was introduced, what it allowed you to do, etc.

Honestly I have a hard time remembering the name, it was a internal intranet portal. Each employee in the company had a page that showed their picture, job title, awards they have received, where they were located, what their SameTime id and phone number was, and what areas of interest and expertise they had. There was also an area for personal interests such as hobbies. I do not know when it was introduced.

How did workers react to its introduction, e.g. both positive and negative responses?

I was not there when the tool was introduced, however, I can try to answer this relative to how new users reacted when introduced to the system. New employees found it helped both find out who were experts in an area, such as a specific web technology or a Java design pattern. It was also great at first to look through the tool for people with offices near us to see their personal interests so we could find common ground to talk about before and after meetings, or by the water cooler. When we came across particularly difficult problems, it was great to find people worldwide (Ireland, Japan, Seattle) who could help us, and we could SameTime them instantly to see if they had any suggestions.

New users did tend to spend quite a bit of time “playing” with the tool, finding people who had won the most number of awards, etc. It would also have been more helpful if we could see this person’s favorite links or reference pages.

Many users had not updated their social profile page in some time, so the material for these people was rather dated (as were the pictures).

Did the tool help you obtain 'corporate knowledge', i.e. how things were done at the company, who you should see to get something done? Please explain.

The tool did help me better understand how to get things done in terms of expertise, but there is a dimension of “power” that was missing. For example, if I had a major problem with a testing team I could not find out how to contact their manager, or someone with the ability to do something, I had to find out through a personal network who a “powerful” person on the team was capable of changing a schedule. The site also did not help much in terms of how things were done, or what the culture of the organization was like.

What features did you find most useful, and why?

The search feature was the most useful, being able to search by location, expertise, etc. was very helpful when trying to find someone to help. Also, being able to instantly link to a form of contact such as e-mail and SameTime was convenient.

What features were most frequently used (by you and others)?

Search again was the most frequently used, as well as the expertise and personal information areas.

Did you encounter any major issues/challenges in using the software, both from a technical standpoint and a collaboration standpoint?

No, I never had problems with the tools in terms of technical difficulties or collaboration. Aside from possibly lacking features it was always available and functional. It could be somewhat slow at times, especially if it was being accessed from outside of the company.

Any other comments about the tool, e.g. improvement suggestions?

None.

APPENDIX C

Interview with a Millennial Worker: Interview Notes

Age: 21 years old

Education background: Has a high school diploma, plus some course work at a community college, and am finishing up with a BS in Simulation and Digital Entertainment from the University of Baltimore. Plans to graduate in May 2008

Company: BreakAway Games, LTD

Position: Junior Designer/Designer Intern

Responsibilities: An aid to Senior Designers, accomplishing tasks that they delegate. A part of the overall game design process on the project that he is currently working on.

How long have you worked there: He has been there since last July, so that is 8 months.

Why did you choose this job?

“I choose this job because I have always had a passion for videos games – and it has been a dream of mine to work on them and help develop them and especially in the capacity of a designer. It has also getting me some great industry experience which is a pretty key factor in getting further jobs in the industry. Money is actually further down the list. The fact that they are paying me is a nice bonus though.”

What do you want to get out of your job?

“I hope to get a lot of good experience working on different types of games and also good tool experience in terms of working in the same software and programs that game devs use. Game software in particular is something that changes a lot – but if you can get the feel of the model you will see similarities from programs to programs. It is a hard then to teach prior to work, so basically still learning even though I am at work.”

How long do you plan to stay at your current job?

“Ideally I would like to be there for as long 2 or 3 years. I am very happy there. I am kind of using it as a stepping stone. I don’t see myself working there definitely for the rest of my career. I would like to stay there as long as I continue to get experience and money from there. I definitely have plans that are larger than Breakaway.”

How committed to you consider yourself to the company?

“Yes – at this point I would consider myself committed in the capacity of my position and circumstance that is required. I’m there part time because I am also at school. The company has a clear understanding of what they expect of me. In that way I am very much committed and

exceed expectations. There is a lot of a revolving door in the industry in terms of people – going here and there, switching jobs – it is a different environment than the old corporations – so not just blanket loyalty to the company – definite feeling of that – a camaraderie not a blood brotherhood.”

How would you characterize your relationship with your manager?

“It is extremely laid back. In many ways he considers me an equal in a lot of ways in terms of the design process and questions of design. I have a lot of flexibility in terms of my schedule as a part time student. He is very receptive with leaving early, and also swinging the odd Monday or Friday to visit Pittsburgh. I recognize it as being very unlike the classic relationship, and it has been a great one that has helped me more than hurt me. A fair managerial approach that they take has been beneficial to me. I don’t work well under pressure.

Can you tell me about a time you had a disagreement with your manager?

“No sharp disagreements are coming in mind – in questions of designs, I am usually able to further express my side of things and my idea and see if I can convince people, but I don’t really marry myself to my ideas and then try to have my way no matter what – it really to reciprocate that laid back attitude they have towards me.”

Is your work typically individual or with a group?

“Mix between individual work and group. There is a lot of collaboration and communication. One reason I got the position in the first case because of my ability to communicate. All day I am in and out of several small and informal meetings. I am okay with asking a lot of questions about new tools – I wouldn’t get very far if I just planned on sitting in my cube all day. But once I get a task, I sit in the cube and work it out.”

Is there a dress code?

“Not at all. Gotta have pants. Casual public attire rules apply – no one can be naked or anything indecent. Extremely laid back. Even the nicest looking guys are wearing jeans.”

What is your opinion of dress codes?

“I have worked a job or few in the past where I have had to dress up wasn’t a problem. The fact I don’t have to for this job is a plus, a perk, so that is nice, but that wouldn’t be a deal breaker though. If they expected people to look nicer I could do that, but the company or the industry doesn’t think that the production is enhanced by dress code anyway – something which I agree with anyway.”

Can you tell me about your work hours?

“Usually I try to come in for the classic 9-5 – 8 hour day – but there is some fluctuation when I have an evening class. Currently my part time schedule allows for 26 or 24 hours a week. On deadline I have come in on the weekends to work overtime hours when needed. The part of

the overall laid back atmosphere – they are giving you breaks, but when we are going to need in – come in overtime. There is a give and take kind of thing. Hours are normal. In fact they say you have to be there in the core hours of 10 – 4 but depending on your work schedule you work earlier than that or later than that”

What is your opinion of overtime?

“I understand the give and take and I do enjoy what I do so that makes it easier. In many ways we are contracted to makes these games and are at the producer companies mercy – you don’t have a choice. I’ve never really felt that way – in my position – but I understand it and they are really good about that. My company will buy us food and be really receptive – and find the next opportunity to give us some time off – very receptive to the fact that we are giving.”

What are your long term goals?

“Short term I would love to continue working at BreakAway – get more and more experience which I’m getting at a daily -- down the road I would like to head towards a more stable and larger dream company – Blizzard Entertainment – lot of game companies out in California and Texas –“

Do you check personal e-mail or IM while at work?

“Yes I do – On day one they have encouraged or suggested that I get any chat programs to communicate with people in office as well as personal use. And even suggested to download games because there will be builds and down times – examples of other employees who play games pretty regularly – almost encouraged – yes”

How do you feel about checking personal e-mail or IM while at work?

“I don’t have a guilty conscious about it – it is easy for me to do both work and manage both of those at the same time – my company is big on the idea that you are there for 8 hours but they aren’t getting 8 hours of solid work there – they expect a certain degree of keeping your mental health/mind healthy by talking to people - -they know your real life doesn’t stop – and the average person at company is very tech savvy and has a technically busy life. Have e-mails, etc – important thing for others.”

What is the average age of employees at the company?

“There are a fair amount of older people – not too many – many 40s – a lot of guys with younger kids – maybe upper 30s”

What communication devices do you use?

“Cell phones, computer, laptop: laptop and gTalk to communicate with friends”

What entertainment devices do you use?

“Laptop, iPod, videogames (Wii and Xbox 360), and yea TV to lesser extent”

What online tools do you use on a regular basis?

“Gmail for e-mail, google as a search engine, news from Comcast homepage (Comcast.net) I do a lot of entertainment website services – but online tools”

Are you a member of any online social networks?

“WOW, Guildmaster – leader of a guild of online community made up of friends – the leader title is pretty much in quotes – organize things, Facebook account, no MySpace, not very avid Facebooker I would say – browse forums, but don’t participate in them, I do read a couple blogs, but don’t really post”

How would you say that technology affects your social life?

“Technology makes my social life possible. It is an amazing tool that has opened very many new doors socially. A lot of my social interaction takes in place within the technology – meeting people and communicating with them – or playing with them.”

How often do you communicate with your family?

“My family – at least once or twice a week. Call them on the phone and I still talk about how I’m doing – still in school – still very much their son – talk about work, school, and um social life, my girlfriend.”

Do you multi-task?

“Yea I do. I believe I can get less effective if I try to do too much. I’ve even heard that multitasking is a total myth. But in terms of having music on – I have multiple tasks going on – but the other tasks diminish.”

Do you hang out with your coworkers outside of work?

“I have started to. I definitely would. One of my coworkers I also go to school with and he is definitely a friend and we go out to lunch – I go out to lunch with other coworkers as well.”

Have you communicated with someone online without meeting them in person?

“I have in fact – I view the relationship – I considerate it almost as if I have met them face to face. In many cases I have spoken to them online – actual voice chatting – I consider – I hold it to the same standard of meeting someone in real person with the slight caveat it is a little odd to meet them in real – but not anything you can put your finger on because you know them and you have talked to them for many months week – there is something funny about it – but actually talking to them to establish trust – playing in WoW with people for what it is worth to establish trust.”

How do you establish trust with someone you have meet only online?

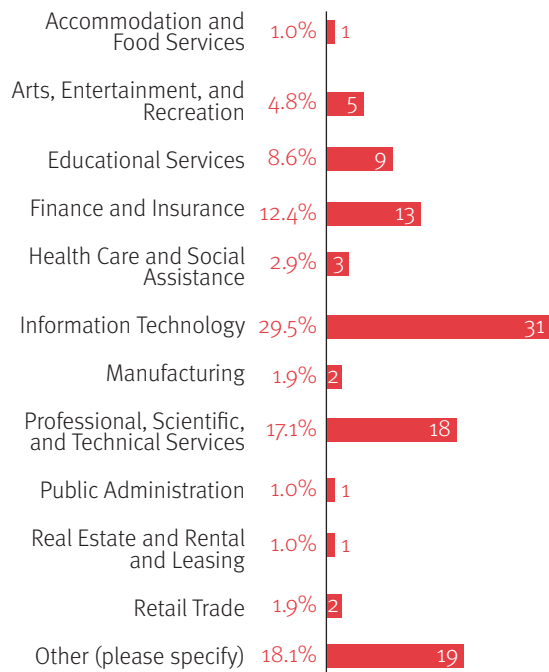
“Through a lot of interaction – volume of interaction – same goes to meeting someone face to face -- the more you get to know them – the more you trust them.”

APPENDIX D

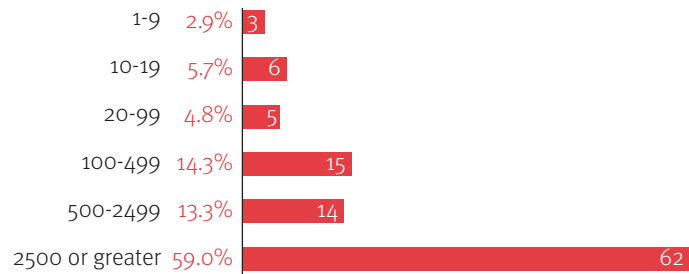
Millennials Survey Results Summary

Total respondents: 105. Open-ended results omitted.

1.1 What industry is your company in?



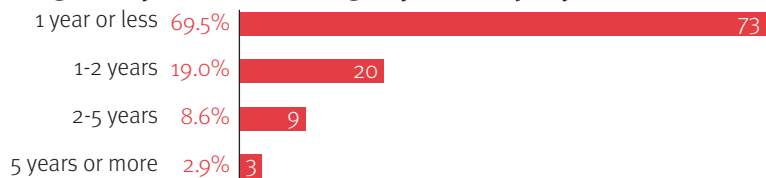
1.2 What is the size of your company?



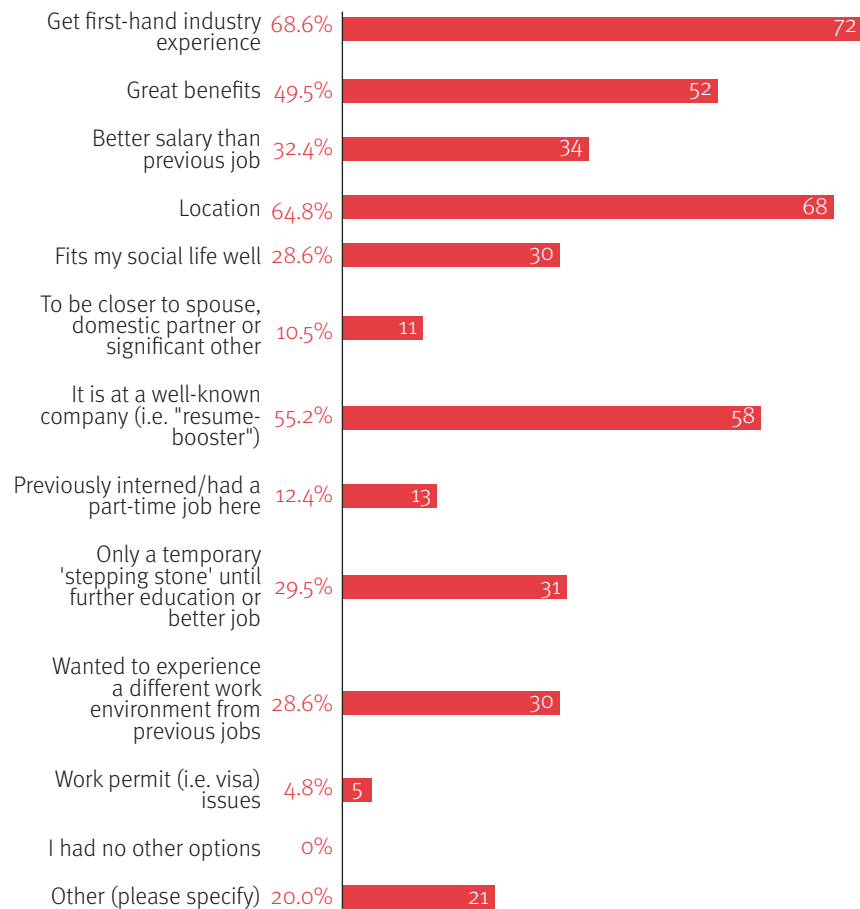
1.3 What is your job title within the company?

[omitted (open-ended)]

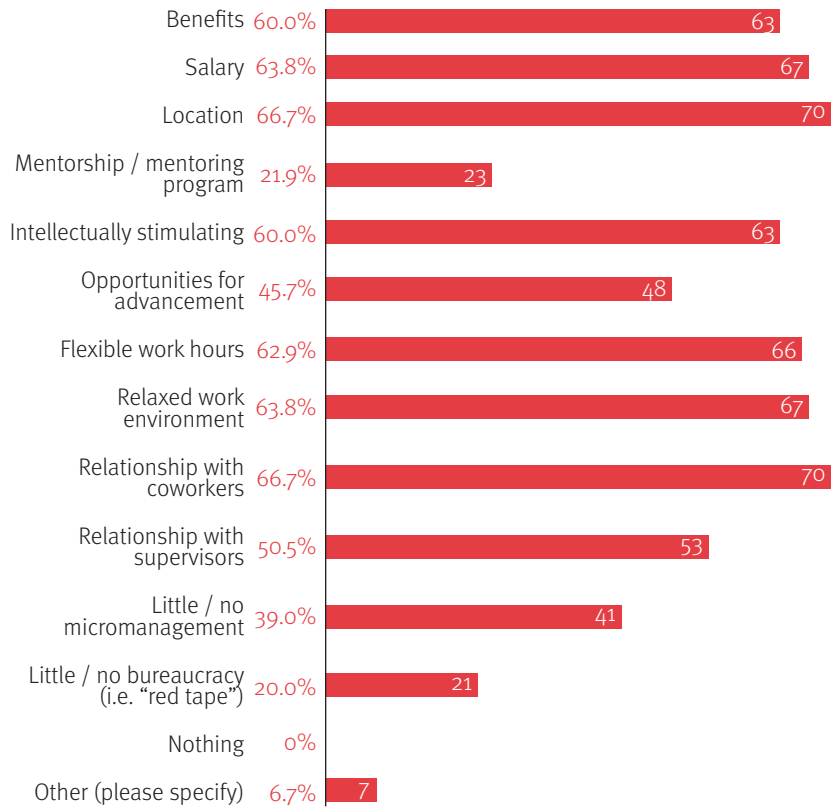
1.4 How long have you been working at your company?



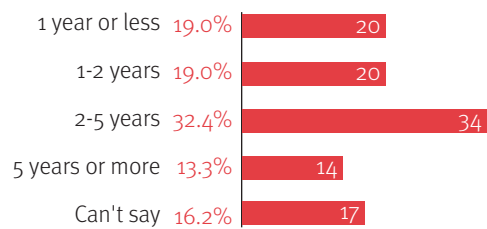
1.5 Why did you choose this job (check all that apply)?



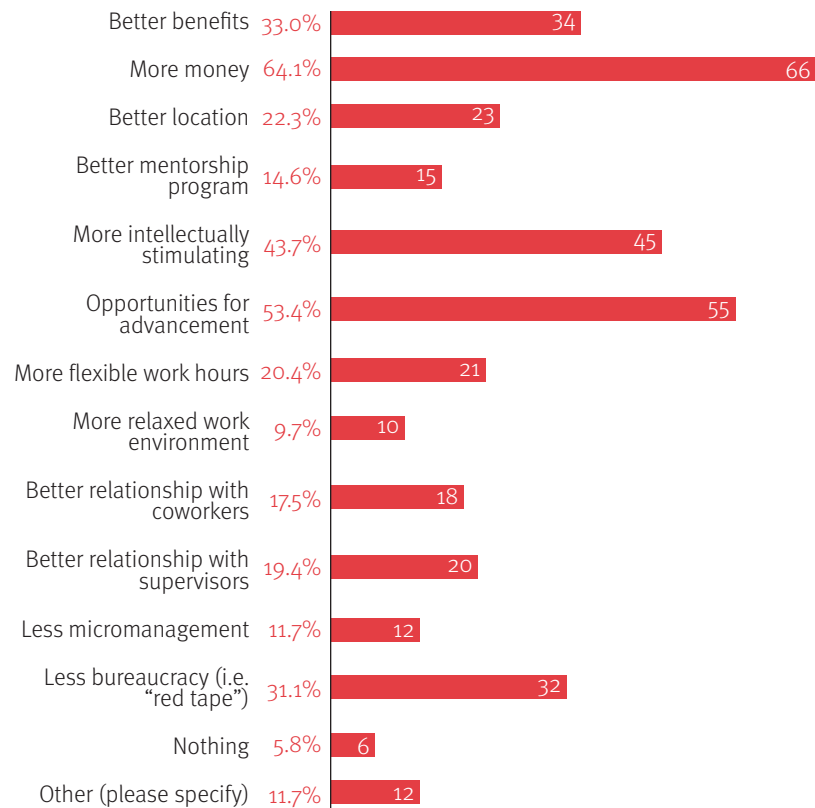
1.6 What do you currently like about your job (check all that apply)?



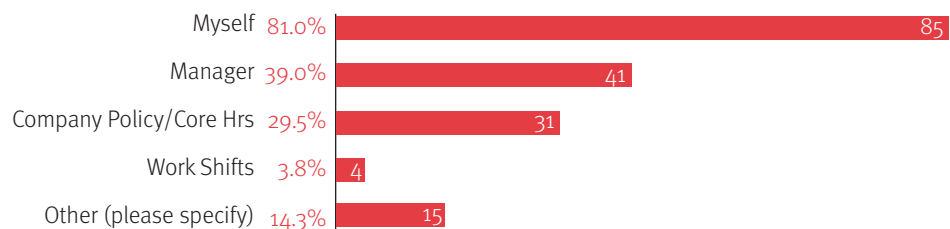
1.7 How long do you plan to stay in this job?



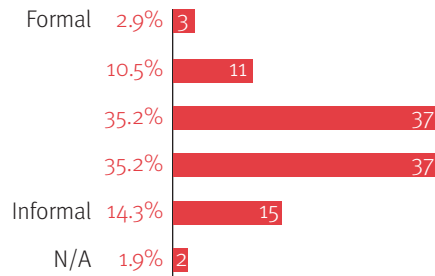
1.8 What would make you stay longer (check all that apply)?



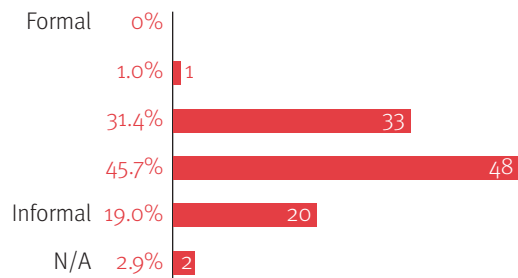
2.1 Who determines your work hours (check all that apply)?



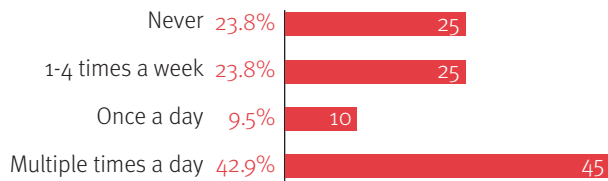
2.2 How would you best describe your relationship with your manager?



2.3 What is your ideal relationship with your manager?



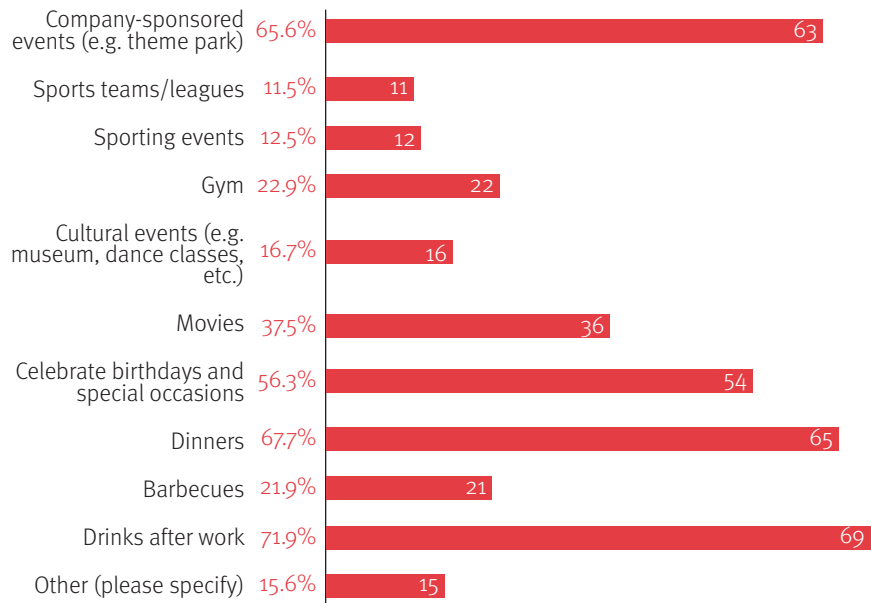
2.4 How often do you engage in instant messenger chats for personal reasons while at work? (Keep in mind, your answers will remain confidential).



2.5 Do you hang out with your co-workers outside of work?



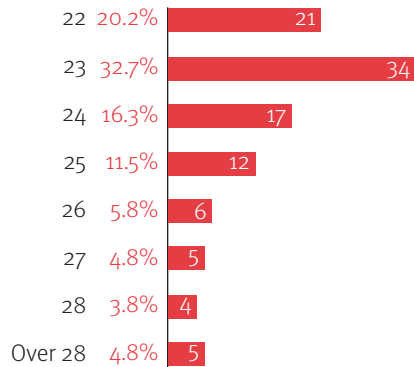
2.6 What types of activities do you engage in with your co-workers outside of work?



3.1 Gender



3.2 Age (years)



3.3 Marital Status

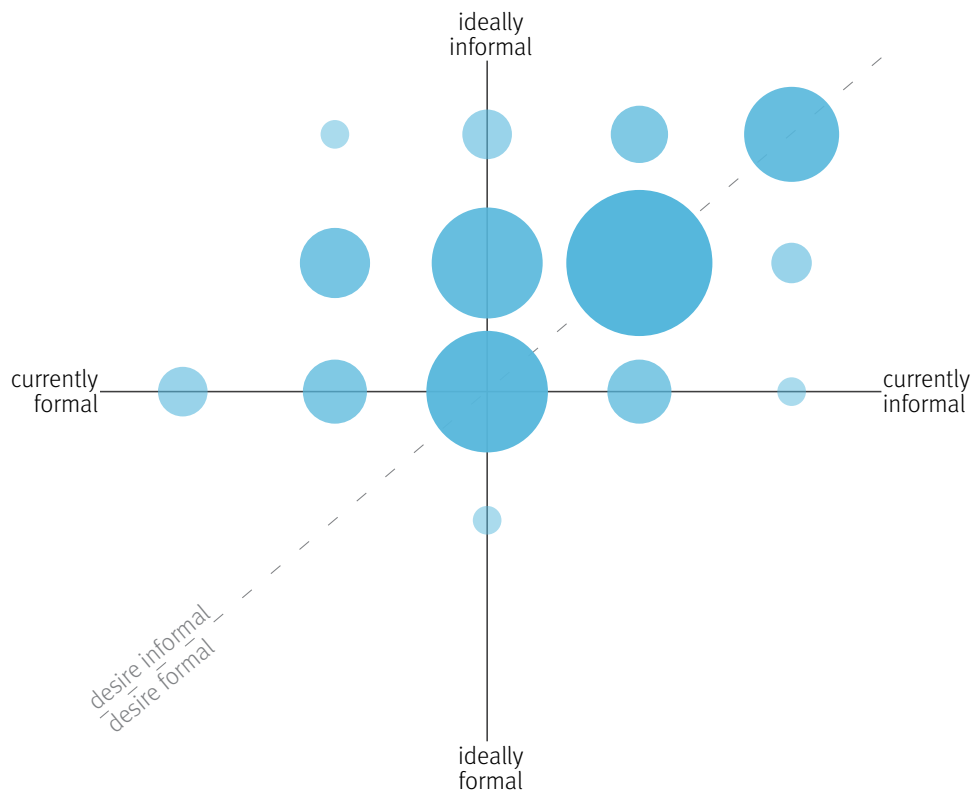


3.4 Do you have any children?



3.5 Zipcode

[omitted (open-ended)]



What are millennials looking for in a job?

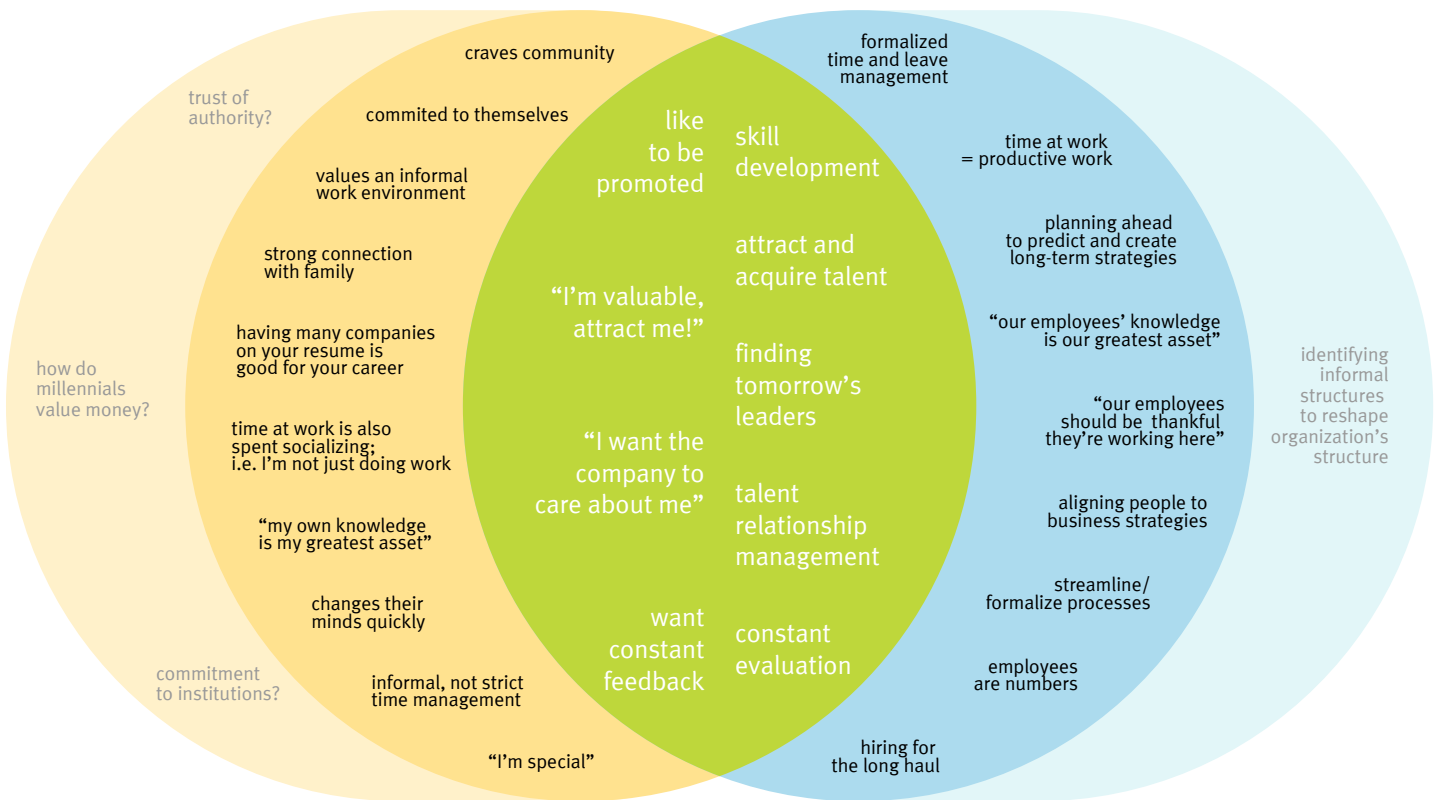


APPENDIX E

Interests Model of Millennial Workers and Human Resources

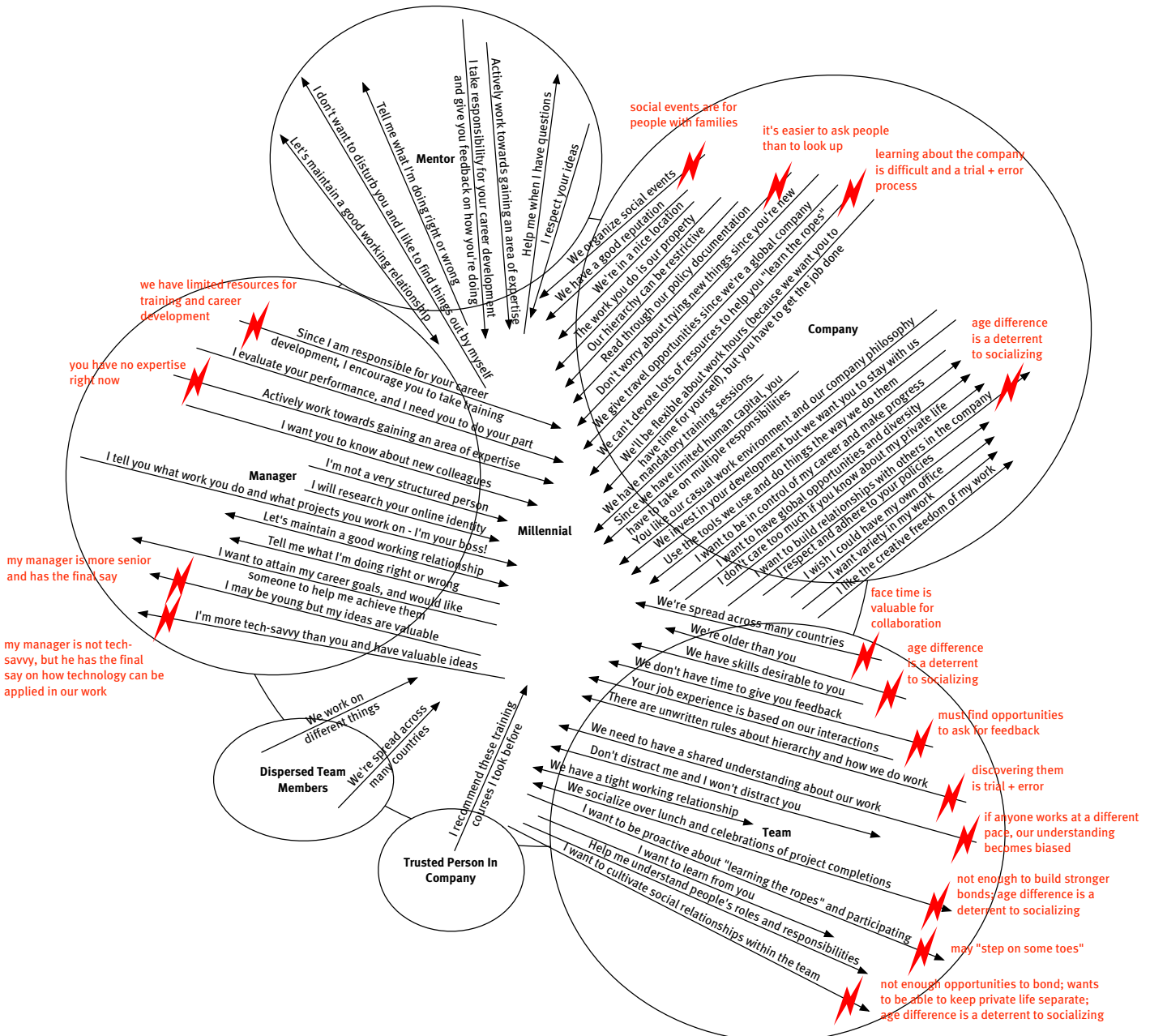
MILLENNIAL WORKERS

HUMAN RESOURCES

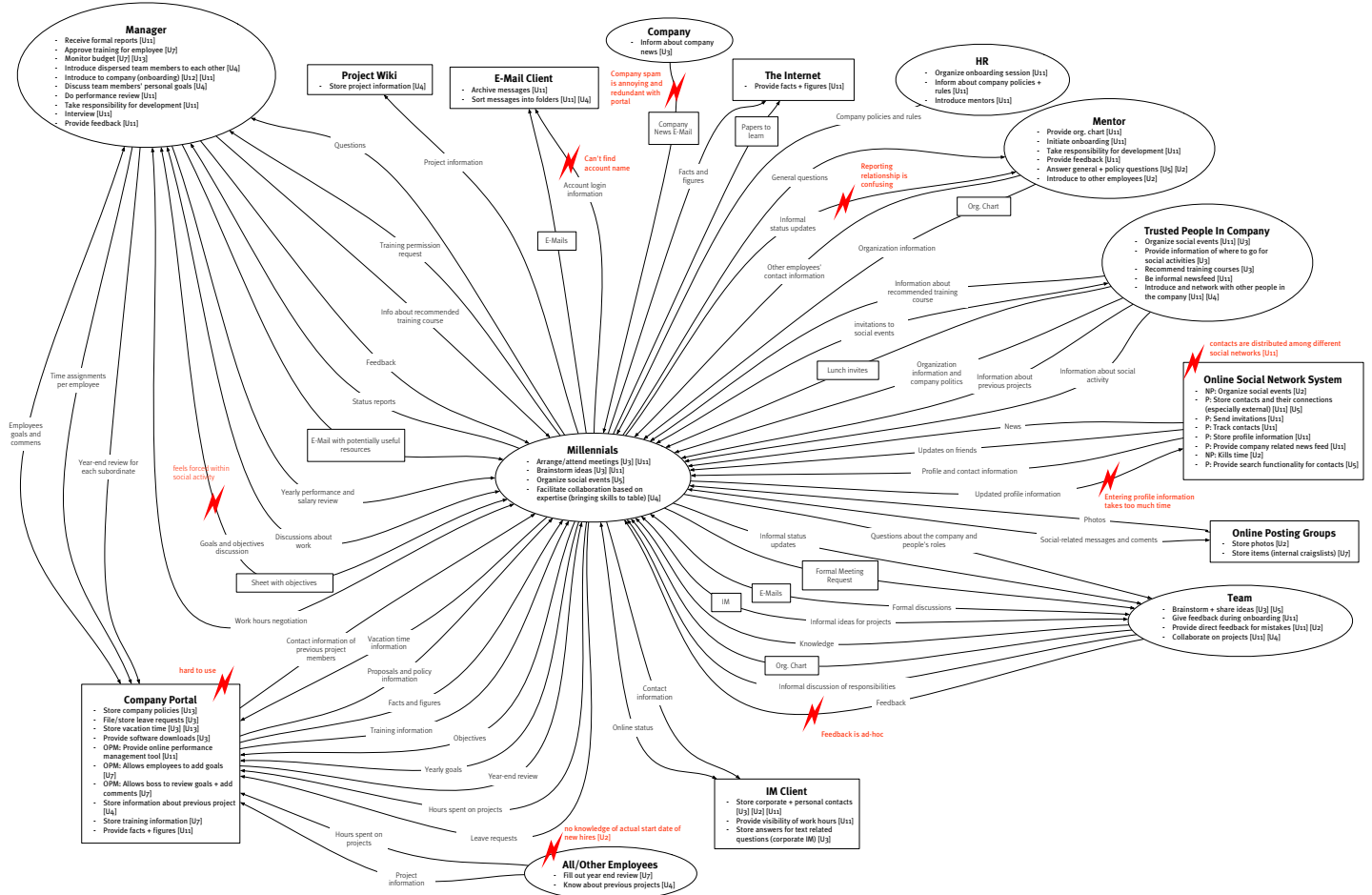


APPENDIX F: CONSOLIDATED CI MODELS

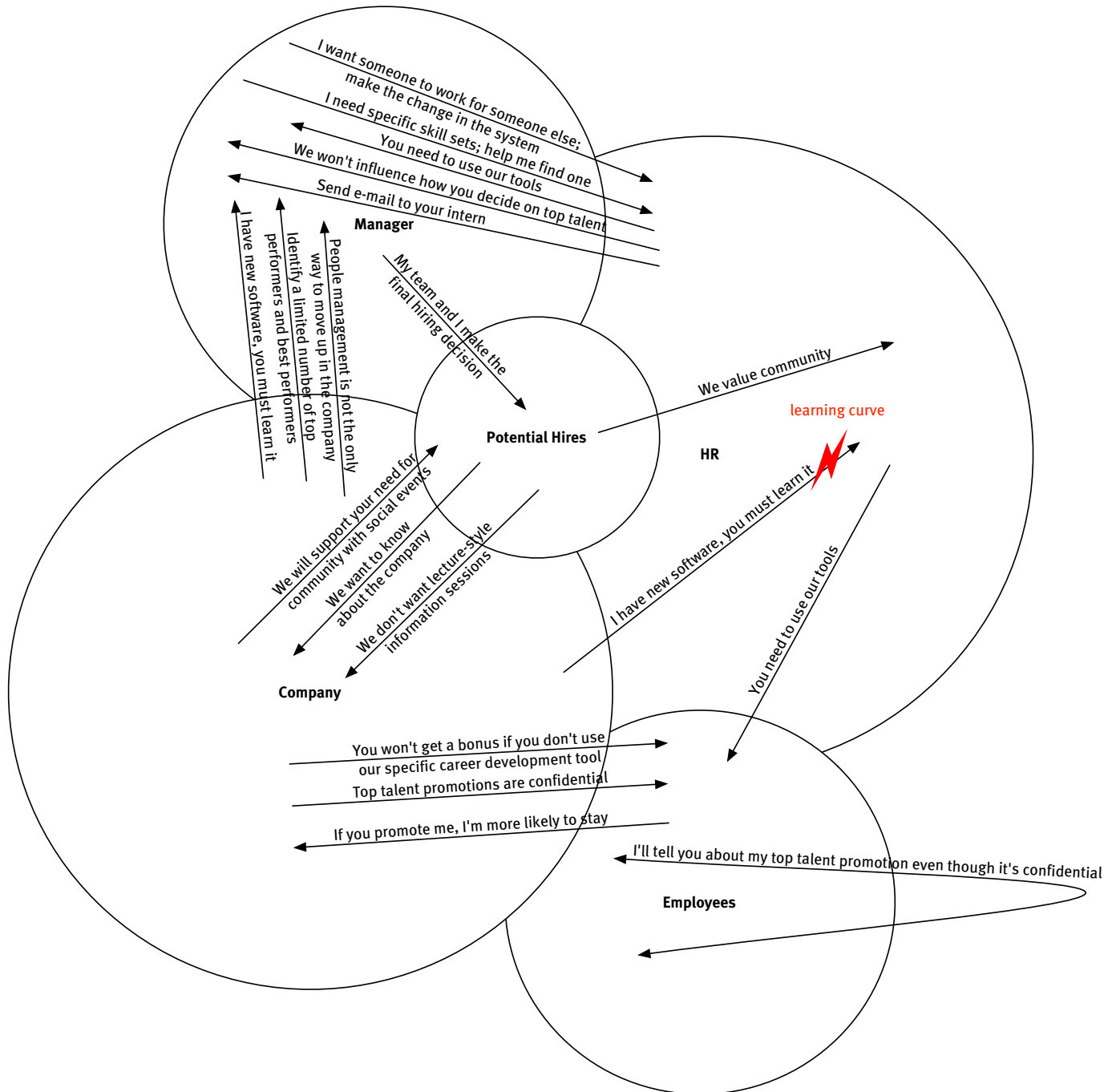
Millennial Cultural Model



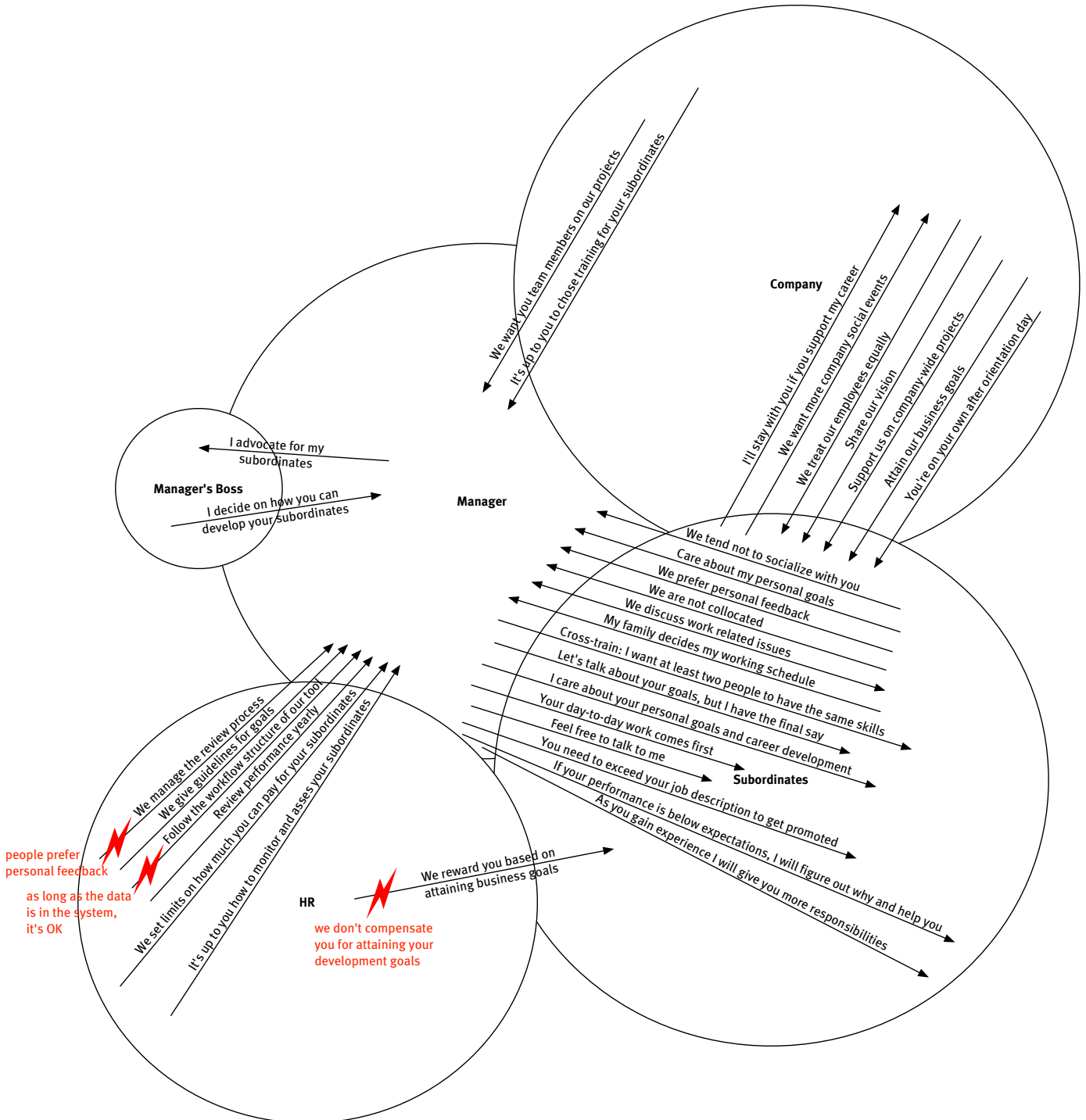
Millennial Workflow Model



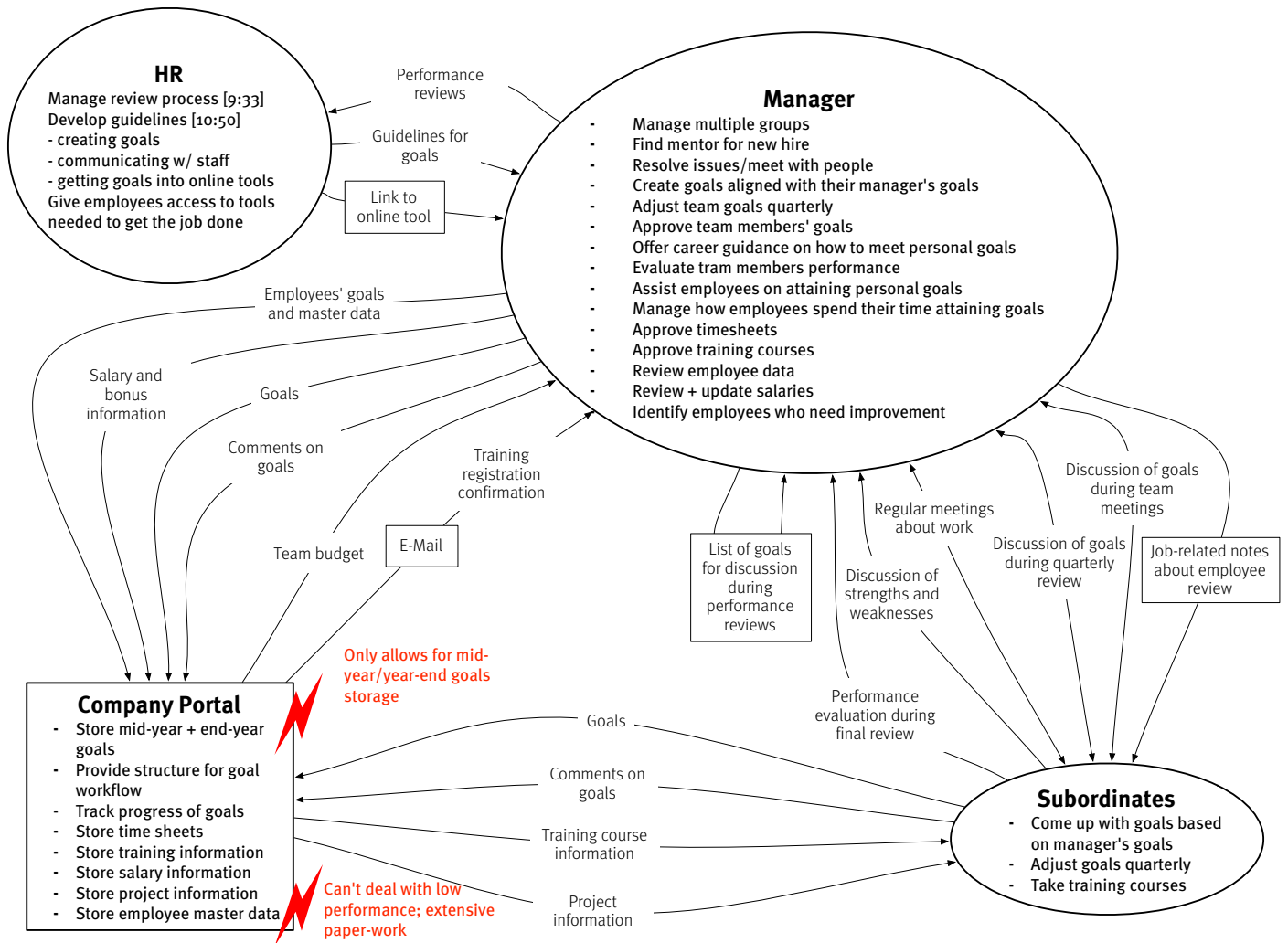
HR Cultural Model



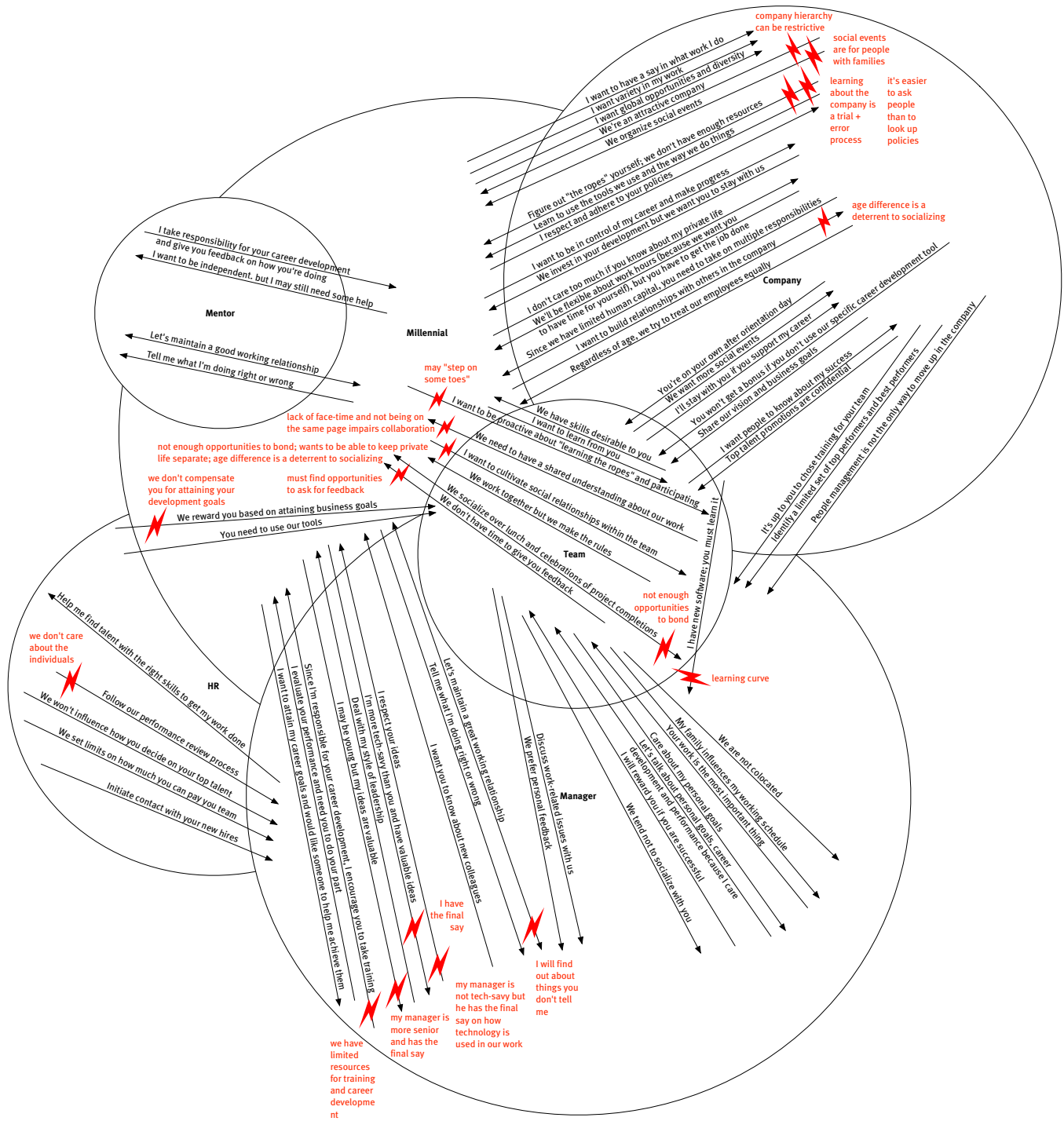
Manager Cultural Model



Manager Workflow Model



Unified Cultural Model



APPENDIX G

ESS Insights with Millennial Lens

	are tech-savvy	are committed to self and developing their skills	like to be promoted quickly	want the company to care about them	crave community
BENEFITS					
A benefit of HCM ESS (time and vacation) is to eliminate paperwork	X				
Asynchronous processing of leave requests and other communication	X				
Self-service automates a lot of transactional events (papers can't get lost, no data entry costs or errors)	X				
Querying a database by skill set and then instantly identifying talent = very valuable!	X				
Companies want to promote certain core competences for every employee		X			
Companies actively encourage employees to develop their talent		X			
Aligning an individual employee objectives with organization's objectives can make them feel special		X			
Large companies are always on the lookout for the next leaders			X		
BREAKDOWNS					
Self-service systems are currently static and on a 'broadcast' model	X				
Social Networks can be useful for public rewards/recognition, but may only be a one-way street to HR's records	X		X		X
Social networking = openness VS performance management = privacy	X	X	X		X
Employees currently think performance management is a pain because they don't see the VALUE in doing it		X			
Employees may have high potential but low performance; tool should encourage high performance and high potential		X			
Skills database is more of an aspirational/motivational tool for HR		X			
Skills database is unused because it is not mandated		X			
Most companies do not mandate that employees maintain their skills in a skills database		X			
Skills are all self-assessed; nobody checked if employee really has that skill		X		X	
Skills database unused because it's mostly beneficial for internal hiring / skills database unused		X	X	X	
Self assessed = less credible, so currently not used for reliable recruiting		X	X	X	
Existing reward tools are too rigid and structured – try and capture the natural interaction of how feedback is given			X		
Currently, data about awards not being used to develop employees (only used for archival purposes)			X		
Rigid reward structure still provides "informal peer-to-peer awards"; but these can be abused			X		X
There is little visibility as to who can see any of the information an employee publishes				X	
Employees don't want HR to be just about filling out forms – instead make it more of a social interaction					X
Organization Charts don't reveal informal networks (only hierarchies, not responsibilities)					X
Networking is not well supported					X
SUPPLEMENTARY INSIGHTS					
Easy access to current policies (vs. paper) / easy distribution of change to policy	X				
Employee can access information on demand	X				
Companies are interested in developing employees' talents		X		X	
Formalized Buddy programs don't always work				X	
Buddy system usually implemented informally; buddy helps with stuff HRM system can't answer				X	

APPENDIX H

User Needs Distilled from Data

Legend: [] data source [IR] interpretation record [U#] CI user number {B} breakdown

Millennial Worker Needs

"I need (to)..."	Data
Understand co-workers' formal roles, titles, responsibilities, and reporting relationships	"Mentor", "Team" Arrows [Mill Flow Model] "Company" Influence breakdown [Unified Cultural] {B} Company hierarchy can be restrictive
Not piss people off; not do other people's work; understand formal and informal responsibilities of co-workers	People don't like it when other people violate their turf (such as when suggesting new ideas etc) [U3 IR 34:00]
Identify co-workers' "real" informal responsibilities	People's real responsibilities are not in any org charts [U11 IR 18:10] "Team" Responsibilities and Arrows [Mill Flow Model] "Company->Mill" Influence [Unified Cultural]
Understand the informal hierarchy of age and experience	There is an informal hierarchy of age and experience [U11 IR 16:10]
The location and age of people that could provide knowledge	People close in proximity and/or age may be the first ones asked for questions [U3 IR, 8:00] Proximity & location supports face-to-face communication [U7 IR 35:41]
Trusted co-workers who can answer my "stupid questions"	Wants to avoid embarrassment in front of co-workers due to possible inexperience [24:20] [25:10] but asking "stupid" questions in front of immediate team members is not as bad [U3 IR 25:05]
To be independent regarding asking questions	"Mentor" Influencer [Unified Cultural]
Access to/know of people who share a "similar vibe", origin, history, commonalities, etc.	Better to talk to other interns than mentor (similar situation) [U2 IR 22:16] Some people are considered to be of "the same kind" and share a similar "vibe" which makes it easier to be comfortable asking them for questions [U3 IR 25:55]
Socialize with co-workers	Big fan of Facebook for scheduling events [U2 IR 3:37v2] Social events may be considered to be geared too much towards families [40:40]; Social events within the team are organized spontaneously [42:20] but one person mainly makes suggestions [U3 IR 42:35] Different team-building/social activities: lunch and celebrating finished projects [U3 IR 6:50] Likes to keep private life separate [U11 IR V19:50] [B] but would appreciate more opportunities to socialize [U11 IR V20:00] "Trusted People in Company" Responsibility [Mill Flow Model] Millennials are more into community [U10 IR 19:50] Contact and connection with people. Want balance with social work [U10 IR 20:41]
Help with achieving my personal and career goals	"Mill->Mgr" Influence [Unified Cultural]
More personal and company resources for training, e.g. time	There is no time for taking training [U3 IR, 29:25] "Company" Influence + Breakdown [Unified Cultural]
Opportunities for career advancement	Possibilities of moving up attracts potential employees [38:45], especially when considering different job offers [U3 IR]

Receive training course information and recommendations	“Trusted People in Company” Responsibility: Recommend training courses; “Manager” Arrow: info about recommended training course; “Company Portal” Responsibility [Mill Flow Model] “Mgr->Mill” Influence [Unified Cultural]
Positive and negative feedback about my performance	Likes performance feedback, wants more of it [U11 IR V25:20] [B] people are too busy for more regular feedback [U11 IR 12:50] more feedback is ad-hoc [13:40], need to have questions ready [13:30] and be flexible about the form of feedback [U11 IR 13:20] negative feedback is given directly [15:10] “Team” Responsibilities and Arrows, “Manager” Responsibility [Mill Flow Model] “Mentor->Mill”, “Team->Mill”, “Mill->Mgr” Influence [Unified Cultural]
Maintain connections outside of your team and company	Maintain contact with workshop and conference attendants [U11 IR V13:20] there is an inner circle of regular co-workers and an outer circle of irregular contacts within the company [U11 IR 23:25]
Build network within the company	“Manager” Responsibility; “Mentor” Responsibility; “Trusted People in Company” Responsibility [Mill Flow Model] “Mill->Company”, “Mgr->Mill” Influence [Unified Cultural]
Learn about co-workers’ skills	“Mill->Team” Influence [Unified Cultural]
Obtain certain skills through practice	U4 feels that there are some skills that can’t be obtained from a training course and must be obtained by practice [U4 IR 36:10] All training is on the job [U13 IR 15:53]
Identify own talent gaps based on market demands	People try to identify their talent gaps based on market demands [U4 IR 32:40]
Identify the unwritten rules within a company	There are lots of “unwritten rules” [11:20], need to figure them out by trial and error [U11 IR 11:35] “Team->Mill” Influence [Unified Cultural]
Quickly and easily look up company policies	There is a company wiki, but U5 finds it easier to simply ask people about company policies instead of look it up [U5 IR 13:15] Company has a hardcopy policy and guideline book, but it is not editable. User try to transform it to wiki format.[U13 IR 10:14] “Company Portal” Responsibility [Mill Flow Model] {B} hard to use
Obtain information about projects I’m not involved with	“Project Wiki” Responsibility; “All/Other Employees” Responsibility; “Company Portal” Responsibility [Mill Flow Model]
Someone with experience to teach me (i.e. mentor)	For U5, in a perfect world, the manager is someone who can teach him and is not just looking out for himself. Also, not too strict. [U5 IR 30:39]
Know co-workers’ status and availability	“IM Client” Responsibility and Arrow [Mill Flow Model]
The ability to show/hide certain information from co-workers	People may not want other people to always see what they are working on [U3 IR 5:40] likes to keep private life separate [U11 IR V19:50] “Mill->Company” Influence [Unified Cultural]
Keep up-to-date with informal company news (including co-workers, etc.)	“Trusted People in Company” Responsibility: Be informal newsfeed [Mill Flow Model]
Be aware of company news	“Company” Responsibility; “Online Social Network System” Responsibility [Mill Flow Model]
Communicate informally	A lot of discussion takes place informally within the team without anyone being specifically invited but through the constraints of the physical space (6 people in one room) [U3 IR 4:10] No one can really escape informal conversation [U3 IR 5:10] IM is used to avoid yelling across the entire room [U3 IR 9:30] Interacts with other intern through instant messenger (Skype and MSN) and via e-mail [U5 IR 4:07]

Communicate efficiently	Because the office is so small, communication is almost always face to face – you just walk over and talk to who you need to [U12 IR 15:09]
Manage list of contacts and organize them by grouping	3 groups of contacts: daily co-workers, extended business contacts, friends@SAP [U11 IR V22:40] adding senior contacts in business SNS is different from “normal” contacts [U11 IR V11:35] “Online Social Network System” Responsibilities, “IM Client” Responsibility [Mill Flow Model]
Have a shared understanding about the work	“Team->Mill” Influence [Unified Cultural]
Have access to onboarding resources beyond the first day	“Company->Team” Influence [Unified Cultural]
“Behind-the-scenes” understanding of the company before taking the job there	friends may influence decision to work for a company [V20:40] and provide behind the scenes look [U11 IR V21:08]

Manager Needs

“I need (to)...”	Data
Align his goals to company's goals	“Company->Mgr” Influence [Unified Cultural]
Subordinates goals to help fulfill his goals	“Subordinates” Responsibility [Mgr Flow Model]
Assist employees with training and attaining personal goals	“Manager” Responsibility [Mgr Flow Model] “Subordinates” Responsibility & Arrow [Mgr Flow Model] “Company->Mgr” Influence [Unified Cultural] “Team->Mgr” Influences [Unified Cultural] “Mgr” Responsibility [HR Flow Model]
Identify employees who need improvement and who are excelling	“Manager” Responsibility [Mgr Flow Model] 3 different career path nominations (that manager have to choose when nominate) [U1 IR 40:50] - People manager - Expert - Project manager
Find talent with specific skillset to get the job done	“Mgr->HR” Influence [Unified Cultural]
Find mentor for new hire	“Manager” Responsibility [Mgr Flow Model]
Flexibility to determine when and how to evaluate employees	Tools allow for mid-year and end of year reviews, but U6 does them quarterly [U6 IR 16:18]
Capture and keep track of informal evaluations/feedback/discussions	Discussions about performance and goals are not stored in system [U6 IR 23:40]
Make subordinates feel accepted in the team, so that it can function well	Shadowing other employees can be part of onboarding [52:14] and helps make people feel accepted [U6 IR 55:20] “Mgr->Millennial” Influence [Unified Cultural]
Be aware of factors that detract subordinates	Employees may only give negative feedback when they already have a better place to go [U6 IR 39:10]
Opportunities to interact personally with subordinates	People prefer a process with more personal interaction [U6 IR 21:30] “Team->Mgr” Influence [Unified Cultural]
Know subordinates' career goals	Caring about employees' career goals helps retaining them [U6 IR 26:35]
Be aware of limited resources for managing subordinates	“Company->Mill” Influence [Unified Cultural]

HR Personnel Needs

"I need (to)..."	Data
Identify talent gaps	"HRBP" Responsibility [HR Flow Model]
Be aware of employee skillsets and what's needed	"HR Recruiter" Responsibility [HR Flow Model] "Mgr->HR" Influence [Unified Cultural]
Capture performance evaluations of the same employee from several managers	Employees may be engaged in several projects & therefore has interactions with different managers - these managers discuss @ PR meetings if this person is nominated [U1 IR 50:43]
Facilitate performance reviews	"HRBP" Arrow [HR Flow Model]
Specialized tools that assist performance review process	"HRBP" Arrow Breakdown [HR Flow Model]
Ensure new hires feel accepted to the company	"HR Recruiter" Arrow [HR Flow Model]
Monitor employee satisfaction	Main reason people leave jobs [U10 IR 34:40] Bored, not challenged Dislike job and boss
Identify factors that attract and retain talent	"Company Portal" Responsibilities [HR Flow Model]
Assist employees with transferring internally	"Company Portal" Responsibilities [HR Flow Model]
Access and maintain master employee data	"Company Portal" Responsibilities [HR Flow Model]
Co-ordinate onboarding experience for new hires	"Learning & Talent Management" Responsibilities [HR Flow Model]
Ensure employees can use company tools	"HRBP" Responsibility [HR Flow Model]
Informing employees about company policies, and clarifying questions about them	"HR Call Center" Responsibility and Arrow [HR Flow Model]; "New Hires" Arrows [HR Flow Model]
Resources to care about individuals	"HR->Mgr" Influence breakdown [Unified Cultural] Dan Hough quote

APPENDIX I

Additional Literature Review

“Ribak, Amnon, Michal Jacovi, and Vladimir Soroka. ”“Ask Before You Search” Peer Support and Community Building with ReachOut.” CSCW '02 (2002): 126 - 135.

One paper dealt with knowledge management within an organization by presenting ReachOut, a “chat-based tool for peer support, collaboration, and community building.” Like our system, ReachOut is not focused on creating a knowledge repository but rather creating connections to help individuals find the knowledge they need by asking others in their organization. The paper lists a number of reasons why dealing with knowledge management in this way is more beneficial to both the individuals and the company than having a large repository. The paper notes the added benefits of allowing users to grow their social network as they communicate with various experts. Other advantages include efficiency, accuracy of information and forming a better sense of community within the organization. ReachOut works like an instant messenger and forum hybrid. Users post a question, which is then sent to a list of potential experts on the topic who can then choose to respond. The conversation stays open even when no one is present in the chat room. One downfall of this technique is that there can be a substantial time delay between when the user first posts their question and when they finally receive the answer they want. Our system hopes to correct this issue by allowing users to visit face to face, call, or IM in order to engage both the novice and the expert in real time conversation until the question is answered.

McDonald, David, and Mark Ackerman. “Just Talk to Me: A Field Study of Expertise Location.” CSCW '98 (1998): 315 - 324.

“Just Talk to Me: A Field Study of Expertise Location” looked at the process people engage in when trying to find who to talk to when they have a question on a particular topic. The article notes that there are a number of psychological factors that go into a person’s decision including how well they are connected to the person socially. The article then breaks down the process of searching for expertise into three categories: expertise identification, expertise selection and escalation.

The knowledge searching process begins with expertise identification, where the user must find out what knowledge and/or special skills their coworkers have. The next step, expertise selection, involves selecting which person to contact for help. The final step in the knowledge finding process is escalation, where the user went for help from a specific person but did not receive the answer or help they needed. In this case the user must go back to the system and try and find another individual.

Our system hopes to help the user through all of the three stages presented in this paper. During expertise identification, the system shows the user number of people that have knowledge on the topic that the user searched for. For the expertise selection, our system provides a wide range of information about each result to the user to help them make a decision. The recent searches pane helps greatly with escalation and allows users to quickly find another expert should the first one prove insufficient.

APPENDIX J

Personas

Although we identified user needs in order to ensure that our solution would address the problems faced by millennial workers, we would need to address these needs in context. Thus, we generated personas that represented the usage and behavior patterns we observed in our research. The personas were primarily created as a design tool for the team so that we could condense our user data in a more digestible form. Later in the semester, we used these personas to validate whether our solution was properly addressing user needs.

^a Cooper, A., Cronin, D., & Reimann, R. (2007). *About Face 3: The Essentials of Interaction Design*. New York, NY: Wiley.

As suggested in About Face 3^a, we mapped our interview subjects onto a set of behavioral variables that would affect their use of a knowledge sharing solution (see Figure 37). For example, millennials would use our system differently depending on their length of time in the company, or their preference for seeking help from team members. We did this for our manager personas as well, but not for our HR persona as we did not observe a diversity in how they might use our system.

Although not specified in our personas, we also knew that our target millennial workers would be working in companies that are at least 2,500 employees, and that their most likely to be in either 1) Information Technology, 2) Professional, Scientific, and Technical Services, 3) Finance and Insurance, and 4) Educational Services, as reflected in our Millennials Survey Results (see Appendix D – Millennials Survey Results Summary). We also identified the following corporate goals that would not necessarily influence our personas' usage patterns but rather influence the overall utility of our solution with respect to the corporation: 1) make money, 2) retain and attract talent, 3) develop talent, 4) retain corporate knowledge, and 5) understand workforce's knowledge.

The breakdown of our eight personas is as follows (see the following pages for the complete personas): four millennials, two managers, one trusted non-millennial employee, and one human resources personnel. These represented the gamut of users that would potentially use our system. Initially, we wanted to pick all four millennials as our primary personas, our managers and trusted employee as secondary personas, and our HR personnel as a supplementary persona. However, after consulting with our client and our peers, we decided to narrow our primary personas down even further, otherwise, we would be attempting to design for too many divergent interests.

The two primary personas we settled on were Jason and Karen. We chose them because their attributes as mapped onto the axes (Figure ### to the right) were quite distinct and cover a wide range of attributes: experienced employee vs. new college grad, formal vs. informal interactions with coworkers, outgoing vs. timid, etc. They would gain the most benefit from our system, particularly Karen, as she is very dependent on others in doing her work. Jennifer has too many other issues with her job that our system cannot address, while Michael is too independent and likes to figure things out on his own for our solution to really address his frustrations and concerns. Thus, Michael and Jennifer became our secondary personas. Andrew (the trusted employee) remained as a secondary

persona because he would be the other type of user of our system, that is, the one answering a lot of questions. Nikhil and Erika (the managers) become tertiary personas so we would no longer focus on them, while Carolyn became a non-user/supplementary persona, meaning that we would not consider her needs at all.

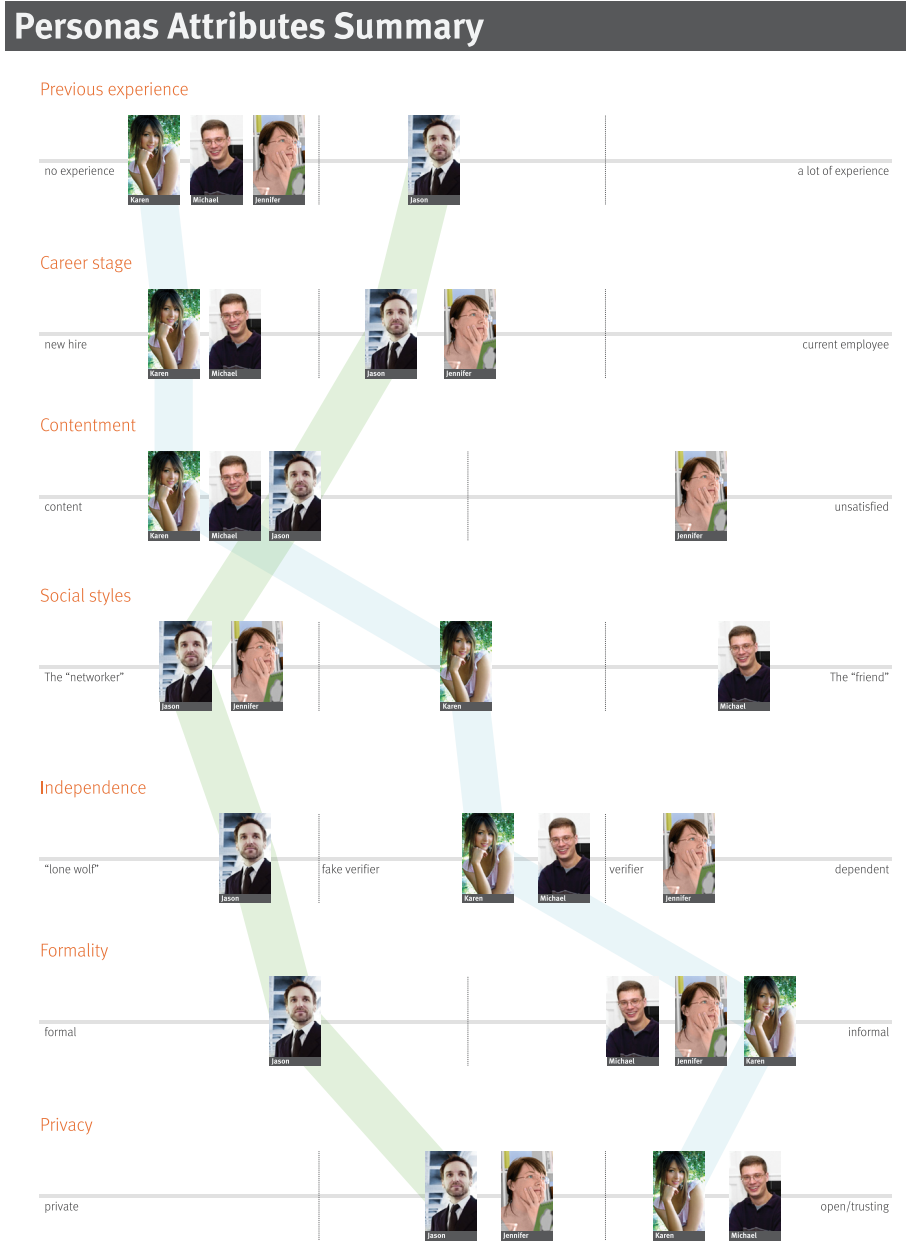


Figure 37 – Millennial persona attributes summary, highlighting our chosen primary personas

Jason Sudlow

Strategy Consultant at a major professional services firm | 27 years old



BACKGROUND

- » With the company for two years
- » Worked at a smaller firm after college
- » Earned an MBA before landing current job

“ To get to the top, you have to make use of all your connections – but make sure to watch out for yourself ”

THE LAST TIME I HAD A QUESTION...

...I immediately tried to think of who I knew that would be able to answer my question by going through my Outlook address book. I found a former project member and gave her a phone call to schedule an informal meeting over lunch. I rely on my network of contacts to help me with areas of expertise I am unfamiliar with even though I prefer working alone so that I can demonstrate my individual strengths.

FRUSTRATIONS

- » People discovering my weaknesses
- » Blurring of social and work life
- » Sharing too much of my hard-earned knowledge with others in the company

LIFE GOALS

- » Enjoy an active social life
- » Appear well-connected to others
- » End up at a C-level position
- » Be financially secure while enjoying life's luxuries

EXPERIENCE GOALS

- » Feel in control
- » Take pride in my mastery of the tools
- » Don't waste time with the tool

END GOALS

- » Obtain enough information to allow me to make personal contact with people
- » Get assistance with keeping track of who I know and how I know them

Karen Miyamoto

Junior Account Manager at an advertising firm | 22 years old



BACKGROUND

- » With the company for just under one year
- » Started this job right after college

“ There are a lot of **knowledgeable** people here and sometimes I feel very **intimidated** asking **trivial questions** ”

THE LAST TIME I HAD A QUESTION...

...I went to a coworker who sits a few feet from me. He didn't know the answer to the question I needed so before making the walk over to my mentor I checked my business contacts on Skype. No one who could answer my question was available so I walked over to my mentor who helped me out. Depending on the type of question, I will usually ask a coworker, my boss, or my mentor in order to find the answer.

FRUSTRATIONS

- » Feeling stupid when asking questions as the new employee
- » Having a boss that doesn't care about my personal development
- » Difficulty finding people of my age to socialize with after work

LIFE GOALS

- » Focus on developing my career
- » Find a close circle of friends

EXPERIENCE GOALS

- » Have fun
- » Don't embarrass myself

END GOALS

- » Find more people like me (age, experience) to socialize with or just talk to/ask questions
- » Find out how I can better my career (e.g. through training courses)
- » Get more feedback more often from my boss and/or others

Michael Sawicki

Software Development Engineer at a leading software company | 23 years old



BACKGROUND

- » Obtained undergraduate degree 3 months ago
- » 2 weeks into starting this job
- » Recently moved to new city and knows few people

“ Information should be structured and organized efficiently so I can work independently ”

THE LAST TIME I HAD A QUESTION...

...I quickly accessed the company portal and entered in the most logical search terms. Unfortunately, after I found the information I needed, I noted that it was a few years old. I therefore decided to find my mentor to double-check the information with him. I don't like to have to interrupt him from his work, but I didn't feel comfortable trusting the out-dated information.

FRUSTRATIONS

- » Finding poorly organized, contradictory, and out-of-date information
- » Dealing with inefficient bureaucracy
- » Coping with inconsistent terminology

LIFE GOALS

- » Find a few good friends who share my hobbies
- » Start a family

EXPERIENCE GOALS

- » Be systematic
- » Feel competent

END GOALS

- » Integrate well with my team
- » Find people to play Ultimate Frisbee with

Jennifer Rhodes

Visual Designer for a large publishing company | 25 years old



BACKGROUND

- » With the company for 2½ years
- » First job out of college
- » As the youngest designer on the team is considered the most inexperienced

“ I’m tired of people telling me what to do. My ideas are **valuable**, and shouldn’t be ignored! ”

THE LAST TIME I HAD A QUESTION...

...I walked over to the team member that I work best with, and asked her about the issues I was having. I don't typically send emails because I don't like waiting for a response, and I find IM to be too impersonal. Face-to-face is really the best way to communicate.

FRUSTRATIONS

- » People not replying quickly to emails
- » Having to cater my designs to my manager's style
- » Always losing out to my manager because he has the final say

LIFE GOALS

- » Have my own design firm one day
- » Be in control of my designs
- » Be my own boss
- » Be able to make designs that have an impact (particularly environmentally)

EXPERIENCE GOALS

- » Feel capable and empowered

END GOALS

- » Find the information I need quickly and efficiently
- » Prove to the team that my work is not to be ignored
- » Build a wide network of contacts so I always have someone to turn to for help

Nikhil Damani

Product Manager at a major IT corporation | 41 years old



BACKGROUND

- » With the company for 8 years
- » Previously worked at two other IT companies

“ To have a successful team you need to care about each individual and utilize the strengths they bring to the table ”

THE LAST TIME I HAD TO ASSIST A TEAM MEMBER...

...I first asked him how things were going outside of work – it's easier to help someone if you know what's been on their mind recently. Knowing this, I was able to give him a more direct response but also suggested a training course that would benefit his career. Besides that, I give my team members regular feedback informally over lunch or just when seeing them around the office. It also helps to conduct performance evaluations quarterly to better ensure my team is matching my boss' goals.

FRUSTRATIONS

- » Not being able to manage my team my way
- » Not being able to 'connect' with my team members
- » Difficulty combining business goals with my individual team member's personal goals

LIFE GOALS

- » Feel respected and trusted
- » Be an approachable person
- » Share my knowledge with others
- » See my two children graduate from college

EXPERIENCE GOALS

- » Don't spend too much time on the system

END GOALS

- » Find out how I can best assist my team members
- » Give my team members constructive feedback on their performance
- » Ensure my team is meeting my supervisor's goals

Erika Young

Senior Product Manager for a leading software company | 36 years old



BACKGROUND

- » With company for 12 years
- » First job out of college; steadily moved up the organization to current position

“ I’m good at **managing projects** but **managing the people** can be a **chore** ”

THE LAST TIME I HAD TO ASSIST A TEAM MEMBER...

...I told him to use the project repository to look up the answer or ask another team member. I am almost always extremely busy and don't have a great deal of time to attend to individual needs. If I answered every question that came my way from other team members I would never get any work done.

FRUSTRATIONS

- » Communicating with my subordinates
- » Finding time to talk with my subordinates and getting them to listen

LIFE GOALS

- » Report directly to the CEO before I reach the age of 40
- » Manage successful projects so I look good in front of my superiors

EXPERIENCE GOALS

- » Be efficient
- » Don't embarrass myself

END GOALS

- » Find out what I need to do to advance to the top of the company
- » Develop a better relationship with my superiors
- » Improve the communication with my subordinates

Andrew Kelly

Senior Systems Analyst at a large automotive corporation | 33 years old



BACKGROUND

- » Graduated with a masters degree 7 years ago
- » With the company for 7 years
- » One of the most experienced members on the team
- » Respected for knowing the ins-and-outs of the company
- » Married; wife is expecting

“ Helping each other is part of getting our work done ”

THE LAST TIME I HAD TO ASSIST A CO-WORKER...

...someone from my team walked up to my cubicle asking me about a specific technology. I gave her my opinion but also told her that I worked with a guy on a project a couple of years ago who might know more. I looked the guy up in our corporate IM, briefly introduced myself and quickly asked him the question my co-worker had. He said the answer was a bit more complicated so I gave my co-worker the contact information and said that she should contact him.

FRUSTRATIONS

- » Being distracted with answering too many questions from co-workers
- » Answering the same questions for every batch of new hires
- » Seeing how difficult it is to become a fully knowledgeable employee in my company

LIFE GOALS

- » A solid career path with few risks
- » Security for my family

EXPERIENCE GOALS

- » Get the work done efficiently
- » Have fun at work

END GOALS

- » Provide a more pleasant experience to new hires than I had when I was new without getting too distracted from my own work

Carolyn Harring

Human-Resources manager at an international software solutions provider | 45 years old



BACKGROUND

- » With current company for 15 years
- » HR manager for current team for 4 years
- » Married; two children in high school

“ Our **policies** are there for a reason – **follow** them! ”

THE LAST TIME I HAD TO ASSIST WITH IDENTIFYING TALENT...

...was when a manager wrote me an email asking how he could give one of his employees a mid-year bonus. I called the manager back because I don't like to explain things in an email. I told him that there is only the year-end performance review upon which the yearly bonus is based. I also told him that he should consult our performance evaluation guidelines if he had further questions about the performance review process.

FRUSTRATIONS

- » Having to fix other people's work when they don't follow procedures
- » Being bothered by people with excessive HR questions

LIFE GOALS

- » Stability and safety for my family
- » Retire comfortably with my husband
- » Be a good mother to my children

EXPERIENCE GOALS

- » Be efficient

END GOALS

- » Get the job done the right way according to HR's policies
- » Deal with less questions
- » Provide teams with new hires as quickly as possible

APPENDIX K

Scenarios and Needs Validation

Before starting the process of prototyping and user testing, we first needed to prioritize the many needs we identified from our research. This was done by conducting needs validation sessions with potential users of our system.

^a Davidoff, S., Lee, M. K, Zimmerman, J., & Dey, A. K.: *Rapidly Exploring Application Design through Speed Dating*. *Proceedings of UbiComp'07*. (2007)

The first step in the needs validation process^a is to create 'Speed Boards' that depict a scenario in which the potential user encounters a need and then uses our solution to address that need. We chose scenarios based on mapping our solution ideas to the needs they address. We then picked the persona that would most express the need, and used that persona to help generate the scenarios. In our needs validation sessions we eliminated references to the personas when presenting the Speed Boards to our users, but within our team we retained the link between personas and scenarios so that we still grounded our scenarios in both the insights of the work we found in our research as well as in the types of users we encountered.

Overall, we created 10 different scenarios (see the following pages) which together address the majority of our insights drawn from the user research. The themes incorporated in these scenarios are:

1. Cross-team contacts
2. Informal responsibilities
3. Training recommendations
4. Company procedures
5. People-based knowledge
6. Identify talent gaps
7. Obtaining project information
8. Similar interests
9. Assigning mentors
10. Personal feedback

For conducting the needs validation, we then recruited 8 participants who are or had worked in large to mid-size companies and who fit into the millennial age range. We asked each participant to go through all the scenarios in random order while thinking aloud and commenting on the scenarios. We specifically paid attention to the initial reactions of our participants which gave us valuable hints on the believability of the situation and general desirability of the solution. We recorded positive and negative reactions as well as general comments about each scenario. After working through the entire set, we asked our participants to identify which scenarios particularly stood out and those which seemed not useful at all. After each session, our team ranked the scenarios according to a five-point scale, with 5 having the most positive reactions and 1 having the most negative reactions.

The scenarios which received the most positive feedback were 'Cross-team contacts', 'Informal responsibilities' and 'Training recommendations'. The least desirable scenarios were those with the themes of 'Similar interests', 'Assigning mentors' and 'Personal feedback'. On the one hand, our participants liked the ability to form new connections to colleagues outside of their teams through co-workers they already knew in order to find answers to their questions. Furthermore, having a system to look up who to ask rather than a pure knowledge storage solution was favored by our participants. On the other hand, our participants had difficulties identifying with the needs of a manager when looking for a mentor and voiced multiple concerns about getting feedback from their peers since this could possibly lead to plotting and manipulation among co-workers (i.e. company politics) when trying to get good feedback in order to receive a bonus. Furthermore, the idea of work and leisure separation, which we already encountered with some users during our previous research reemerged during our needs validation as well, thus resulting in less positive feedback for the scenario which addresses the need to make connections with co-workers based on similar personal interests.

After we had ranked the most important needs for our design, we needed to discover the overall underlying structure to each of the solutions depicted in the scenarios in order to abstract them to a more general solution which addresses all of those needs. For this purpose, we devised a 5 step model of knowledge retrieval through people in a work setting. The five steps are:

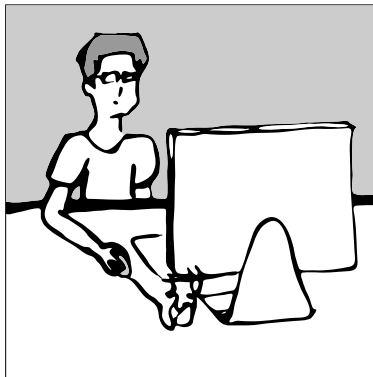
1. What are you looking for?
2. Who has that knowledge?
3. How is that person connected to that knowledge?
4. How are you connected to the person?
5. How can you communicate with that person?

This model acts as a way of conceptually separating our design based on the cognitive steps that an employee executes when trying to retrieve knowledge. From this model, we proceeded to create the overall workflow of our solution from which we then started our sketching and wireframing process.

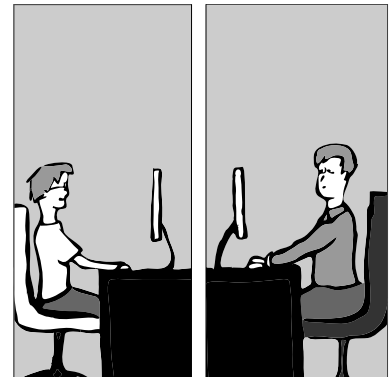
(1) Informal responsibilities



At your weekly team meeting, you are assigned to a new project. You are told that there is a database of information that you need to access to work on the project. However, you don't have an account that allows you to log in. No one in your team knows who to ask to help set this up.



You search the company portal for a list of people associated with the database. Not only does the search return the names of the people, but also their physical locations in the company and highlights the people who are available to talk to via IM.

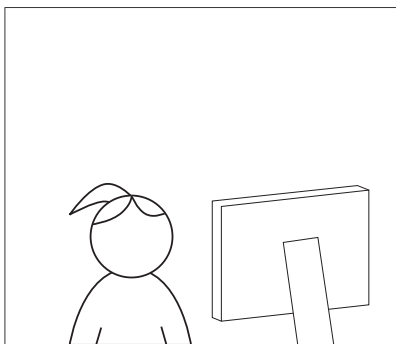


You send a quick IM to the person marked as the administrator for the database, and get your account set up.

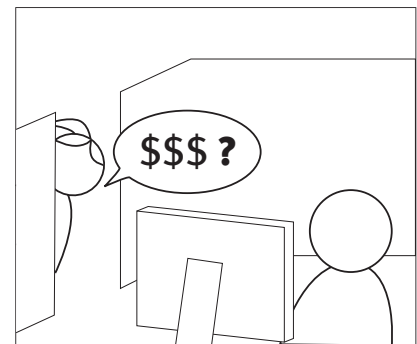
(2) People-based knowledge



You need to find out how to properly create a cost estimate for an advertising campaign project for a client.



You enter "campaign cost estimate" into your computer and are given a map of people closest to your location who created campaign cost estimates before.

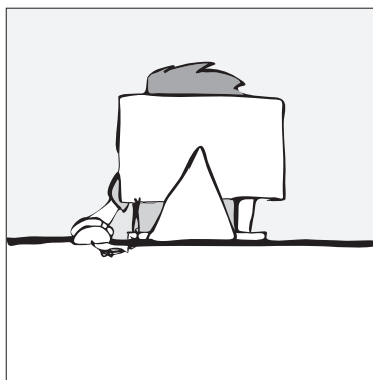


You note that one person on the list is a co-worker from your own team so you walk over to him and ask him about the process of creating campaign cost estimates.

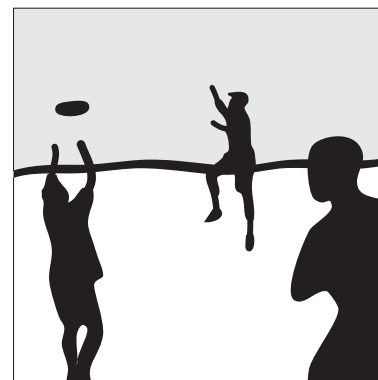
(3) Similar interests



You have recently been hired, and don't know many of the people at the company. You want to meet people, and are especially interested in finding someone to play Ultimate Frisbee with you.



You search the company portal using the terms "Ultimate Frisbee" and find a list of people who enjoy playing the game. The system also prioritizes people who share other hobbies and interests with you.

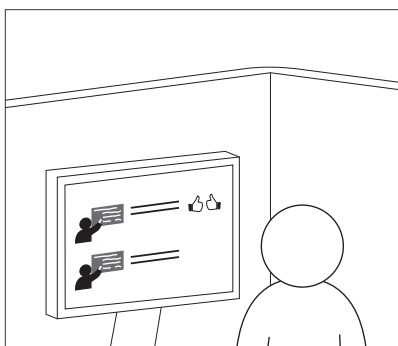


Looking through the list, you decide to contact people of an age similar to you, and you set up a game of Ultimate Frisbee.

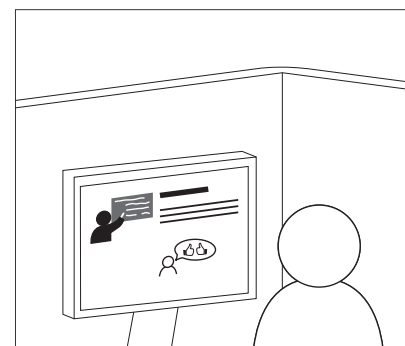
(4) Training recommendations



During a recent discussion of your performance over the past year, your manager suggests that you should take a training course on intra-company communication to help you advance your career.

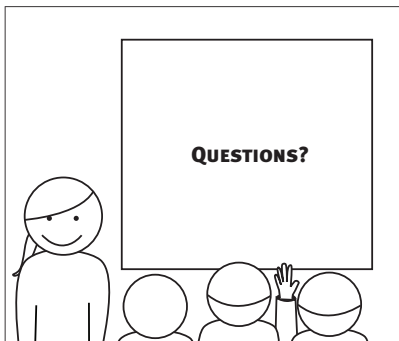


You search for "communication" in the training recommendation system. A list of courses taken by other company employees appears, sorted by how well each course has been rated by graduates of the course. Some of the courses are indicated as having been taken by one of your connections in the company.

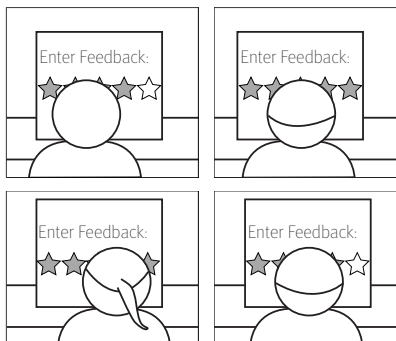


You select "Communicating Up, Down and Across the Organization" since it was taken by your colleague. After reading the favorable comments left by your colleague, you proceed to register for the course through the system.

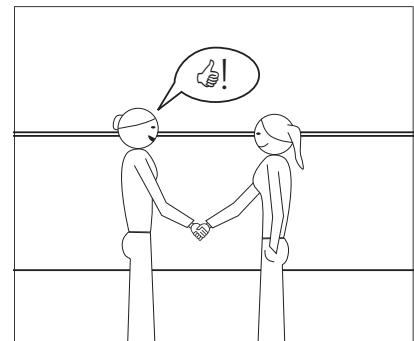
(5) Personal Feedback



You and your team have just finished a large project you are all proud of.

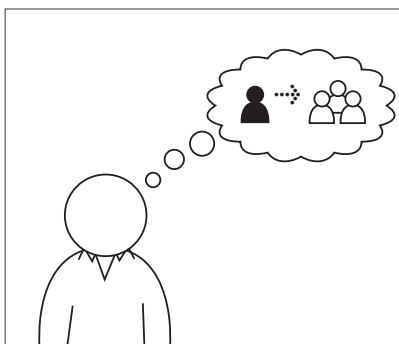


Impressed with your contributions, your team members enter positive feedback into the system about you.

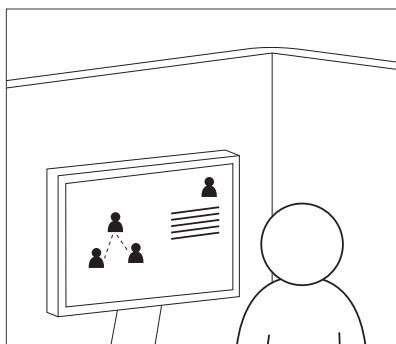


The system notifies your manager of the positive feedback, which she then reads for more detail. The next time your manager sees you, she commends you on a job well done.

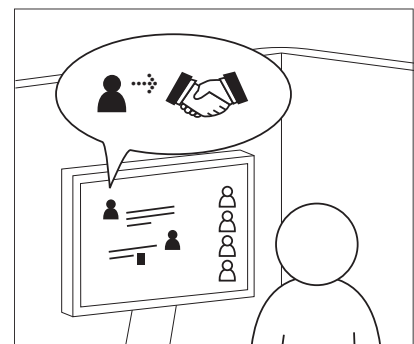
(6) Cross-team contacts



You want to switch to a different team within your company. Unfortunately, you do not know anybody within that team.



You look up the other team in the system and are presented with a visualization of the team. You are also shown that a member of that team worked on a project with a co-worker on your team.



Seeing that your co-worker is available, you send him an IM asking about the person on the other team. Your co-worker tells you that he would be happy to introduce you if you wanted to.

(7) Identify talent gaps



You know that your team is about to start development on a large project. Parts of the project will require the use of Adobe Flex.



You log into the system to determine which of your team members is most knowledgeable about Flex. You notice that no one has experience with the new technology.

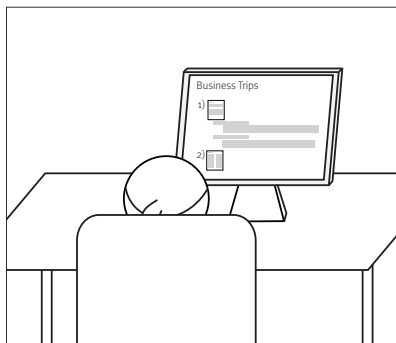


You decide to sign up for a training course to learn Flex.

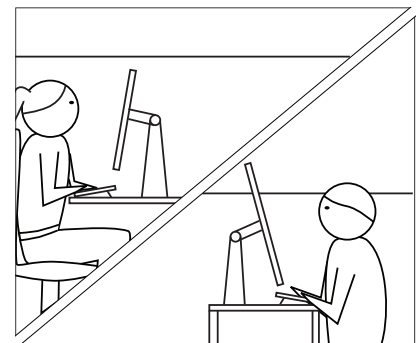
(8) Company Procedures



You are about to go on your first business trip after only being with the company for less than one year. Your manager explains all of the paper work you need to complete in order to leave but you are still confused about what you need to do.

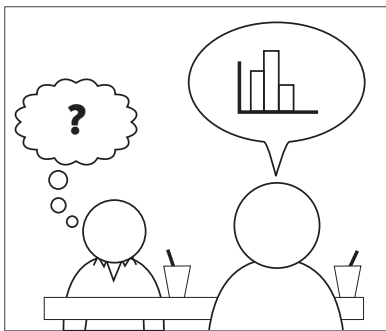


You search the system for "Business Trips" and find an informal write-up about what needs to be done for a business trip.

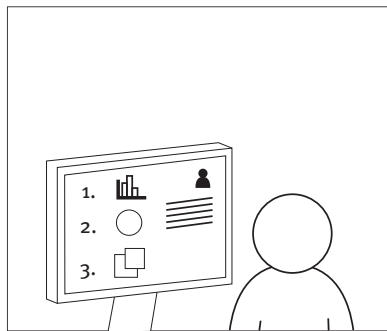


You look over this information and then contact the author of the write up to confirm all of the details.

(9) Obtaining project information



While having lunch with a co-worker, you hear about an interesting project someone from a different team worked on. You think that this project may be relevant to the work you are doing.



You enter the person's name your co-worker gave you into the system. The system then gives you a list of projects that person has worked on, classified by tags.



You pick the project with the tags which most closely match what the co-worker was talking about and are presented with information about the project.

(10) Assigning mentors



You are a manager and need to find a mentor for a new employee joining your team next month. You look through a list of your team members that are active on the company Q&A platform, dedicated to answering questions posted by employees throughout the company.



You notice that Andrew, a well-respected member of the team, appears near the top of the list, along with other potential mentors.



You send a confirmation e-mail to Andrew to check if he is interested in being a mentor for the new hire.

APPENDIX L

Overall Workflow, Competitive Analysis, and Areas of Opportunity

In order to start fleshing out the details of our design, we generated a sketch of what a user's workflow might be when using the system. We utilized both the knowledge retrieval model as well as our primary millennial personas when creating this workflow. Since the workflow involves our personas, it is best prefaced by the following scenario: Jason has been asked by his team's clients to come up with new marketing strategies, and, though he is not knowledgeable about viral marketing, thinks he can find someone else within the company who can help him as he thinks this strategy might benefit the client's campaign.

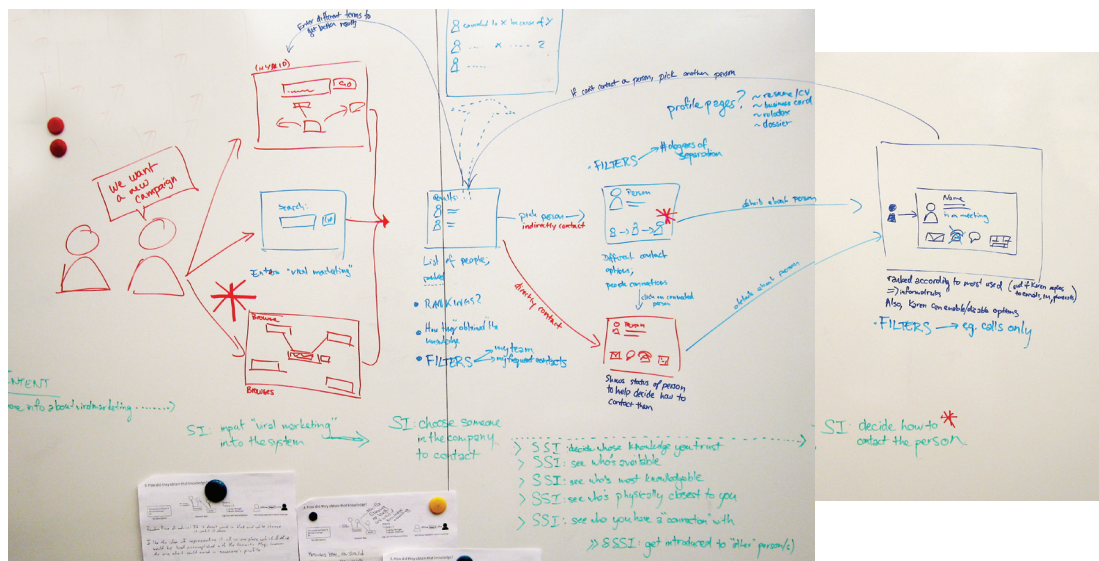


Figure 38 – Process Flow Diagram

Jason's primary intent in using the system is then to find out more about viral marketing. In order to accomplish this intent he has three other 'sub-intents', namely, A) to input viral marketing into the system (step 1 of the knowledge retrieval model); B) to choose someone in the company to contact (steps 2-4); and C) to decide how to contact that person (step 5). Solely looking at the number of steps involved, we can see that choosing someone in the company to contact (sub-intent B) requires the most thought for Jason. Also, if one sub-intent cannot be accomplished then Jason must redo the previous sub-intent (e.g. if Jason is unable to contact person X, he will look for someone else in the company; if he can't find someone in the company, he will try entering a different search term into the system).

Looking at this workflow, we recognized that solutions already exist that try and solve the primary intent of expertise-finding that Jason has. Because of our background research, however, we knew that the problem still exists in companies today, and that there are many workarounds to try and solve it – data repositories (e.g. wikis) to try and capture project information, online social network systems to try and bring employees closer together, company portals to try and capture company policies. Thus, we conducted another competitive analysis at a high-level but with a focus on knowledge sharing, in order to identify which parts of the workflow revealed areas of opportunity.

Competitive Analysis

We conducted an analysis of four corporate knowledge sharing solutions: SONAR (Trampoline Systems)^a, Atlas (IBM)^b, Visible Path (Visible Path Corp)^c and MetaSight (Morphix)^d. While each one has its own strengths and weaknesses, looking at all their features combined shows that there is still room for improvement.

a <http://www.trampoline-systems.com/product/SONAR+Dashboard/overview>

b <http://www.technologyreview.com/player/07/12/28Naone/1.aspx>

c <http://www.visiblepath.com>

d <http://www.tehuty.co.za/morphix.htm>

Trampoline Systems launched SONAR on April 2008 and is marketing the system as “intelligent social networking for the enterprise.” Some of its main selling points include: i) automatically-updated employee profiles which are populated based on information from corporate communications, ii) news feeds of peer and network activity, iii) easy-to-use privacy controls that allow users to approve all information before being made public, and iv) integration with LinkedIn.

While SONAR focuses on connections within a company, Visible Path also allows users to see contacts outside of their organization. Visible Path also scans communication flows between contacts to infer connections, but does not delve into the actual content of the communication (e.g. only e-mail subject lines, not the e-mail body). A unique feature of the system is to be able to show alternate connections to a person and to show exactly how many degrees that person is separated from the user, without revealing the identities of those in the path.

MetaSight takes a slightly different approach from the other solutions in that it allows users to not only see their connections in a network visualization, but also makes it possible for users to analyze the trends of communication flow with their contacts. For example, a user can view a heat map of which month they had sent the most e-mails to a contact, or see how the amount of communication has changed over time. Thus, when deciding who to contact on a particular topic, the user can use these visualizations to make their decision.

IBM's Atlas is unlike the previously mentioned tools in that it is completely dependent on the data provided by another platform, Lotus Connections. Because of this, however, the data it gathers includes more than just e-mail communication but also information such as who reads who's blog, who is in the same virtual community, etc. Atlas can be likened to a mix between SONAR and MetaSight, in that it allows users to search for experts and connect with them, but it also provides other information such as frequency of communication, mapping of expertise networks and corporate structure, etc.

Areas of Opportunity

When we map the features of the existing solutions onto our workflow (see Figure 38), we see that there is room for improvement in the following areas:

1. Providing new methods for inputting the search term and browsing peoples' expertise
While all the solutions allow for a direct text search on a particular knowledge topic, none of them easily facilitate finding experts of topics whose keywords are not familiar to the user. For example, a user may be aware of marketing but not familiar with the terms for the different facets of marketing. A system that assists users in specifying what area of knowledge they want to search for (e.g. through suggestions) would be beneficial to the user.
2. Presenting a visualization that assists with deciding who to contact
In a large company, it can be difficult finding the person that can give the user the right information to get the job done. By presenting the user with more context about these experts (e.g. through a semantic map of their expertise and their connections to the user), they should be able to make more informed decisions before they contact the knowledgeable person.
3. Providing alternate connections/paths to a user's contact
When the user does not directly know the knowledgeable person, they often go through the people they do know within the company in order to get introduced. However, there may be cases where it might not be appropriate to go through a certain contact, in which case it would be helpful for the user to see alternate connections. At the moment, only Visible Path makes it explicit that this can be done, and we see this as being a valuable feature for the user. In particular, it could be useful to know the nature of how people are connected between the user and the knowledgeable person.
4. Presenting the physical location, availability, and communication preferences of employees
While all the corporate solutions give the contact information of the knowledgeable person, there is almost no information about the immediate availability and location of that person. Furthermore, there is no real guarantee that the person will promptly respond to an e-mail that is sent by the user. By providing the user with this information, they can decide by what method they should contact the person, and may even choose to contact another person based on whether they are more likely to respond to a phone call than an e-mail.
5. Conveying informal rules within the company
Although not directly addressed by the corporate solutions we analyzed, this was an area that frequently arose in our background research. Organizational units (teams, departments, companies, etc.) will have their own sets of norms and rules that are not necessarily apparent to people outside of that unit or even to new hires. Within the context of knowledge sharing, a

system that could convey, for example, that the department head is actually an approachable person willing to spend time with those lower down in the organization chart would be useful to the user in that it could either expedite their expertise-finding or help avoid potential embarrassments.

Based on these areas of opportunity, we started creating wireframes of what our system might be like.

APPENDIX M

Wireframes and Paper Prototypes

Our early wireframes were created as a way of beginning design at a more detailed level. The wireframes consisted of three main concepts detailed below, which we presented and solicited feedback on during a class critique.

Desktop widget

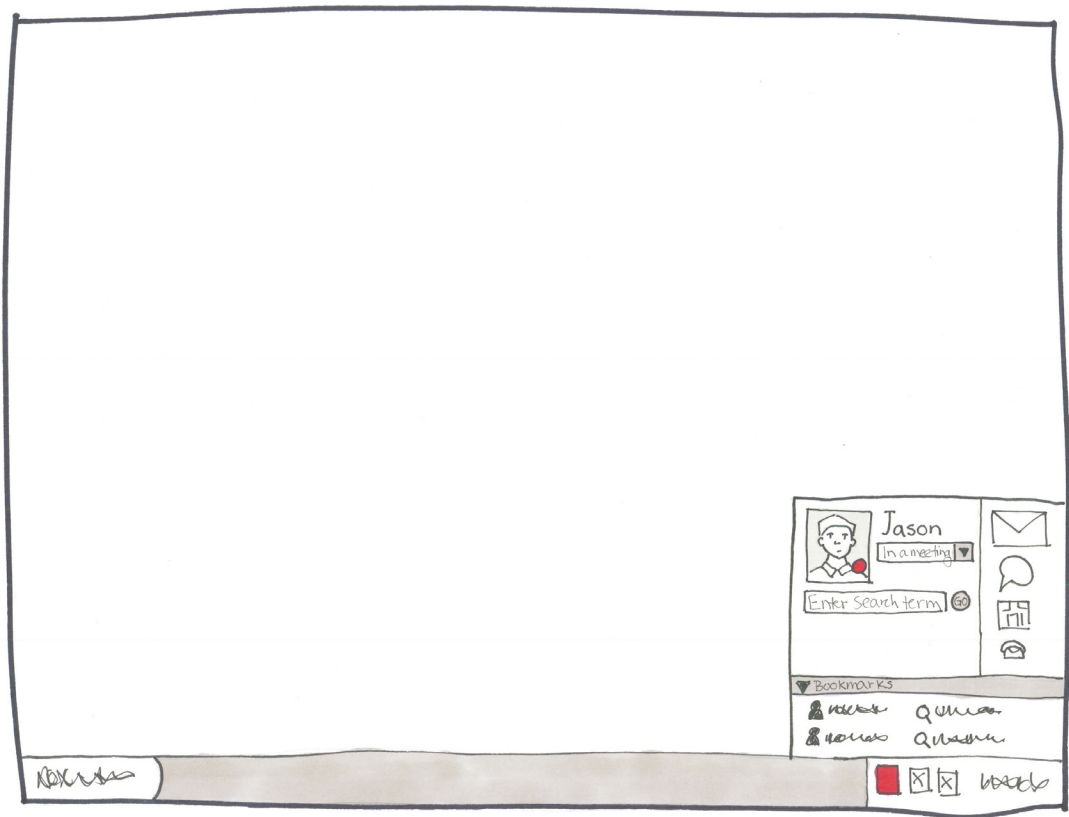


Figure 39 – Early wireframe of the desktop widget

We designed a desktop widget as a way of providing a convenient entry point to the system. Since the user's main intent is to search for people in the company with particular expertise, the widget enables them to access the system regardless of the work they are currently doing on the computer. However, as a knowledgeable person, the user's main intent is to inform others of their availability and communication preferences, so these can also be set in the widget. A status can be set along with an accompanying message to reflect the user's current availability; also, modes of communication can

be ranked according to preference or even disabled entirely. Since our background research revealed that people often forget to set their statuses on related applications such as IM clients, the system tray icon would reflect the user's current status so that they are aware of the status they are currently broadcasting. There is also a bookmarks pane that allows the user to quickly revisit a previous set of search results, or a specific person's profile.

Results page

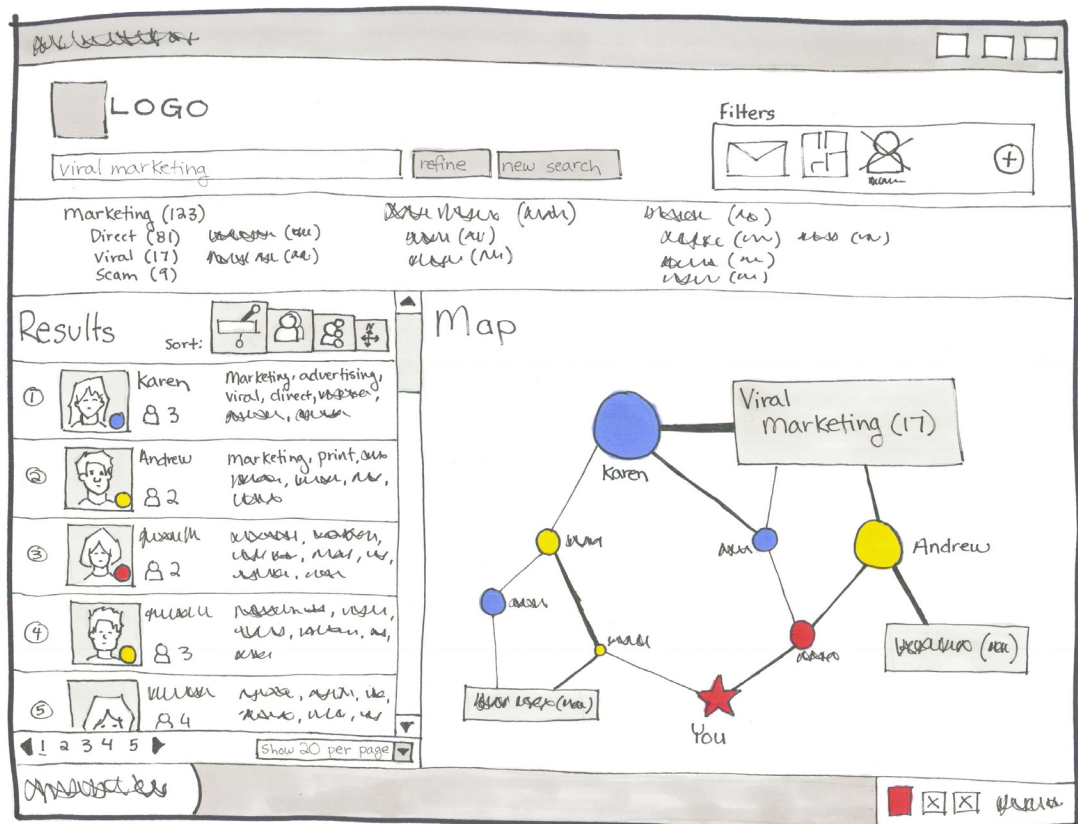


Figure 40 – Early wireframe of the search results page

When the user has entered their search term through the widget, a browser opens and they are taken to the results page of the system. We designed the system to be browser-accessible, as it allows employees access to the system regardless of their location. It also makes it possible for the system to be accessed on mobile devices, which millennial workers are very likely to have.

The results page is where the user sees information about all the possible people they can contact in the company who have some knowledge about their particular search term. The user's intention at this stage is to make a decision on who to contact, and so the system presents them with plenty of information in order to assist them in making that decision. Similarly to Google Maps, a list of results appears on the left with a few details about each person, while on the right is a visualization of these results and how the user is connected to these people. The list can be sorted by one of four options: 1) level of expertise, 2) degrees of separation, 3) availability, and 4) physical distance. In the visualization, people are shown as circles connected to either other circles (other people that they know) or rectangles (knowledge topics related to the search term, including the search term itself). Each person node is colored depending on their availability (busy vs. idle vs. free) and is sized according to their level of expertise on the search term. Stroke weight also denotes the frequency of communication between two people, or the frequency of communication that a knowledgeable person makes regarding the topic. Should the user not completely know the exact terms they are searching for, the map displays related topics and whether the currently displayed results are also connected to them. A list of related keywords is also shown at the top of the screen along with the number of people who are connected to that knowledge. Should the number of results be too large, the user also has the ability to filter their results at the top right portion of the screen, with criteria including communication preferences and degrees of separation.

Business cards

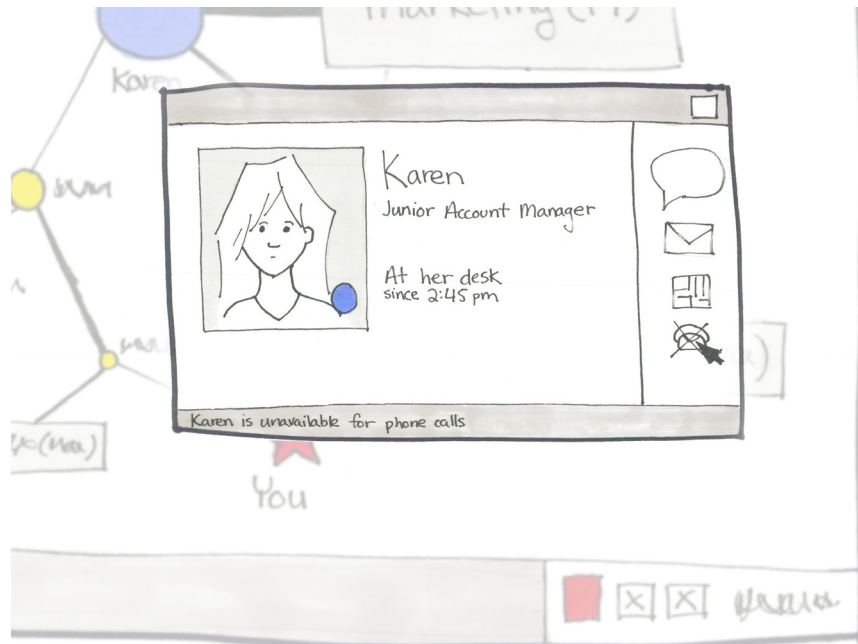


Figure 41 – Early wireframe of the business card

When the user has thought about contacting a person from the results page, they can easily access that person's 'business card' by either clicking on their row on the results page or by clicking on their node on the map. The business card allows the user to decide the best way to contact this person, and, based on this information, might even choose someone else entirely if their original choice is not available. The user sees more information about the person, especially their preferred mode of communication as well as any modes of communication that the person has made unavailable. The person's status is also prominently displayed. From here, the user can launch their e-mail client, IM client, IP-based telephone, or see a map of the person's office. Clicking on the person's picture takes the user to that person's profile page with even more detailed information about the person's past projects, work experience, etc.

Early Wireframe Feedback

Although we only presented three screens to a group of our peers, we were able to get valuable feedback that helped us refine our designs. We went into a discussion of whether there was any value in being able to rank modes of communication and decided that forcing the user to rank the communication methods in order of preference was quite a burden to the user. Instead, we decided to simplify the setting of communication preferences and only allowed for either enabling or disabling a communication method. We also went into a discussion about the burden of setting status messages, as well as the notion that employees should always be 'busy' since they are at work. We concluded that it would be less of a burden if the status message was instead always tied to the employee's corporate calendar. This way, the system already utilizes information from the calendar but relieves the user the burden of having to set themselves as free vs busy.

The most valuable feedback we received from the critique, however, was that our results page was overly complex, especially the visualization. While we were presenting the user with plenty of information to make an informed decision, we were giving the user information overload since all the information was not needed all at the same time. In particular, comments generally revolved around the idea that we were presenting the user with too many options and leaving too much of the decision-making to the user. Based on this feedback, we drastically simplified the map such that it became an expertise browser (instead of conveying connections between people), removed the ability to sort results and instead changed the design such that the user is presented with the best result up front. Should they wish to explore other results they are able to still browse the expertise details of each result. This feedback was incorporated into our paper prototypes which we used for think-aloud user testing.

Paper Prototypes and User Testing

Paper prototypes of our system were brought to New York for testing with millennials currently in the work force. A total of eight users were asked to perform think-alouds on the paper prototypes. Each user went through one practice task to make sure they understood the think-aloud procedure, followed by five actual tasks on our system (see Appendix N – Think-Aloud Tasks for Paper Prototype User Testing).

Once the user testing was completed in New York, the results were compiled and summarized so improvements could be made before work began on the high fidelity prototype. The results can be found in the table on the next page.

System part	Widget		
What was tested	Setting Communication Preferences	Bookmarking a person and using the bookmark	Searching with filters
Findings	Users understood the first three communication icons (email, imp, phone) but not the building icon	Star icon does not convey the idea of bookmarking	Users did not use the filters
	Users were not sure what clicking on the icons would do	"Bookmarking" people doesn't fit the user's mental model	Unclear is users understood "Degrees of Separation"
	User thought clicking might enable the communication (actually disables it)	Users forgot the name of the person they just bookmarked and as a result could not find the bookmark later	Some users did not understand the degrees of separation icon
	Tool tips (brought up by hovering over the buttons) cleared up any uncertainty	Users wanted a list of recent searches as well as more content connected to the bookmark	Users clicked on the blank "filter drawer" instead of the add filter button
	All but one user understood how to use the communication icons once they clicked on them once	Users were confused this task with bookmarking the actual webpage	One user tried to filter the results by expertise
	Several users tried to right click on the system try icon to set their communication preferences		One user clicked on the status message expecting something to happen
	Some users confused the communication icons with the search filters		
The building icon was difficult for the users to understand			
To Do	See what other programs use for representing location		Reword and add labels
			Show result count (1-5 of 2500)
			Keep search filters collapsed in widget
			Confirmation action on filter dialog

Figure 42 – Summary of findings from user testing of paper prototypes

Results Page			Misc Issues
Accessing profile page	Choosing who to contact and how	Using Expertise Browser	
Most users easily figured out that clicking on the picture goes to the profile page	Users were confused over what the default search order is	Most users understood hierarchy of information	What happens if you search for multiple terms?
Users understood tag cloud on profile page	Some users were confused by the meaning of the relevance bar	Users correctly understood the number next to each topic (number of results)	
There is a disconnect between widget communication icons and profile page communication icons	Most users used previous experience to make decision on who to contact	Users liked the circle over a tree design	
Users clicked on their own picture to go to their own profile page then wondered what happens if they clicked the phone icon ("Would I call myself?")	Tabbed results worked for most users		
Map only shows the current floor. What if the user is in a different building?	One user expected a vertical list and was surprised by horizontal tabs		
	One user didn't even see the results until the final task		
	Degrees of separation was not clear to all the users. "Does one degree mean I know the person or there is one person between us?"		
	One user thought connected people were also knowledgeable about the search term		

APPENDIX N

Think-Aloud Tasks for Paper Prototype User Testing

Background

You are Jason and you work in a large company (2500+ employees). Your company mandates the use of a knowledge sharing system, which shows each employee's area of expertise, their communication preferences, as well as their connections within the company.

Task 1

You need to create a viral marketing campaign but you don't know anything about viral marketing

- a) Click on the blue system tray icon to access the knowledge sharing system
- b) Find someone knowledgeable to ask about viral marketing
- c) Bookmark that person for later reference

Task 2

Search for someone who knows about viral marketing that is directly connected to you and available by e-mail and IM. Make sure that you can meet that person at his/her desk.

Task 3 (original)

Use the bookmark you made earlier in Task 1 to find the physical location of that person

Task 3 (revised)

Use the bookmark you made earlier in Task 1 to find the office location of that person

Task 4

Set your communication preferences to allow only e-mail

Task 5 (original)

You have recently done a search on 'software configuration management' but you feel that the people in the search result will not be able to help you sufficiently.

Find a knowledgeable person in a more general field of expertise that is related to 'software configuration management'.

Task 5 (revised)

You have recently done a search on 'software configuration management' but you feel that the people in the search result will not be able to help you sufficiently.

Find a knowledgeable person in a more general field of expertise than 'software configuration management'.

APPENDIX O

Hi-Fi Prototypes

Using the feedback we obtain from our paper prototype user testing, we began construction on the high fidelity prototypes. The high fidelity prototypes were created using a combination of Adobe Flash, HTML, CSS, and Javascript. The widget and expertise browser were created completely in Flash using ActionScript 3.0. The search results page, profile page and home page were all created with HTML, CSS and Javascript.

Once a preliminary version of the high fidelity prototype was created and working smoothly, user testing began. Since we had sufficiently tested the needs of the system with millennials currently in the work force, we felt a need to focus more on usability in this round of testing. As a result, we did not require working millennials, and any millennials would suffice as a candidate for user testing. A total of nine millennials went through four different tasks while thinking aloud and any issues were recorded (see Appendix P – Think-Aloud Tasks for Hi-Fi Prototype User Testing and Appendix Q – Insights from Hi-Fi Prototype User Testing). Modifications were made to the high fidelity prototype as issues arose through the various rounds of user testing.

Once the user testing was completed the final modifications were made to the high fidelity prototype. In addition, graphics and code were cleaned up before presenting the final prototype to our clients.

APPENDIX P

Think-Aloud Tasks for Hi-Fi Prototype User Testing

Background

You are Jason and you work in a large company (2500+ employees). Your company mandates the use of a knowledge sharing system, which shows each employee's area of expertise, their communication preferences, as well as their connections within the company.

Task 1

You need to create a viral marketing campaign but you don't know anything about viral marketing

- a) Click on the system tray icon to access Forté
- b) Find someone knowledgeable to ask about viral marketing that
 - i) you know either directly or through a friend,
 - ii) can meet with face-to-face, and
 - iii) is currently not in a meeting

Task 1 (revised)

You need to create a viral marketing campaign but you don't know anything about viral marketing

- a) Click on the system tray icon to access Forté
- b) Find someone knowledgeable to ask about viral marketing that
 - i) you know either directly or through a friend, and
 - ii) can meet with face-to-faceYou can use the 'Search Filters' panel to assist you.
- c) Make sure the person is currently not in a meeting

Task 2

Find a person you know through a friend.
Look up the office location of your FRIEND.

Task 3

Find a person who specializes in a subcategory of 'direct marketing'.

Task 4

Set your communication preferences to allow only instant messaging.

Task 5 (original)

You recently did a search on ‘social networks’, and you remember a person named Lesley in the top results.

You have another question for Lesley. Find Lesley’s phone number.

Task 5 (revised)

You recently did a search on ‘social networks’, and you remember a person named Lesley in the top results.

You have another question for Lesley. Find Lesley’s phone number.

You can use the ‘Recent Searches’ panel to assist you.

APPENDIX Q

Insights from Hi-Fi Prototype User Testing

General Findings

- * “Below the fold” issues (obsolete; now fits in a 1024x768 browser window)
- * Tab visibility!
- * After he knew the filters were there, he knew how to use them
 - » was somewhat looking for a 'meeting' filter
- * “Offline” vs. “at the desk” notion (obsolete; now shows “x has no scheduled appointments”)
 - » what does that mean? “Can I still go and visit them?”
- * Mini-profile was interpreted as the profile
- * Widget is cool! Doesn't like having to open up a browser to get to the system
- * hinted at maybe wanting results right in the widget (?)
- * Said it looked professional
- * Random results is somewhat interpreted as a glitch
 - » Checksum??
- * Filters: Switch toggle buttons↔slider?
- * Filters: convey inclusiveness of degrees
- * Phone popup: make it a confirmation such that it doesn't start calling immediately (obsolete)
- * Should the viz reflect the filtered results?
- * way to filter out 'top management'? Would never want to talk to them.
- * wants persistent search filters
- * make the icons look like buttons?, or convey what actually happens

Findings from Task 1

User A

- * Looked at filters and thought they weren't helpful: “Degrees of separation? Don't think I need this.”
- * Generally had confusion with degrees of separation: “through a friend? one or more??”
- * More likely to filter by communication by degrees of separation
- * Surprised by the behavior of the > “woaaaah!”
- * Didn't understand what the plus meant in 4 degrees icon

User B

- * Hovered over a lot of things, e.g.
- * Didn't open the filters pane
- * Wondered about search order (“alphabetically??”)
- * No problem with connections
- * Understood degrees of separation icons
- * Didn't user filters
- * Said “want to search right away”

User C

- * Hovered a lot
- * Used the search filters
- * Had no motivation so didn't type 'viral marketing'

User D

- * Hovered over EVERYTHING
- * Went to the filters directly, and opened the panel, hovered over everything
- * Clicked on the slider and realized there were tooltips, looked at what it meant and stopped at 'through a friend'
- * Typed search term and hit enter
- * Clicked on viral marketing but said "it didn't do anything"

User G

- * Tooltips were useful, but he would go from person to person to find out what the 'enabled' tooltip was; confusion about face-to-face versus office map (obsolete; tooltip is now more descriptive)
 - » More important to know what enabled meant
- * Didn't use the widget search filters, NOR the page filters
 - understood the checkboxes WHEN the filters were introduced to him
 - icons seemed to work: "I want one person between me and the person of interest"
 - » FITTS LAW: slider is too small. (obsolete)
- * Clicked through the tabs till he found someone
- * Was confused that a person was offline, and their face-to-face was still enabled
- * "This person is available for a face-to-face meeting because they are at their desk", even though the desk icon is disabled.
- * Was confused about the degrees of separation
 - » when looking at paths, saw "You->person->person of interest", interpreted as "there's three people here"
- * TASK/WORDING: "through a friend" not necessarily interpreted as 2 degrees.
- * Didn't scroll down, SO didn't see meeting/offline banners (obsolete; now fits in 1024x768 browser window)

Findings from Task 2

User A

- * Had some questions understanding the task
- * found someone directly connected and clicked
- * didn't know who his friend was, but stupid issue cos you'd know who your friends are
- * clicked on icon and said "oh oh, I only want the phone number." (obsolete)

User B

- * didn't know where to start, so clarified task wording
- * didn't have problem clicking on the picture
- * once they got to the profile, knew where the phone number was
- * didn't like the layout of the info
- * found the filter and viz inbetween tasks

User C

- * immediately used slider
- * no problems understanding the connections images

User D

- * didn't really know what "through a friend" meant
- * once she found someone that matched the criteria, hovered over the connection picture
- * was really surprised by the phone popup, wasn't expecting something to happen (obsolete; no longer a javascript confirmation box)
- * was confused that the office icon meant availability but also an action

User G

- * Did exactly what we expected him to do (and found the office location of the PERSON, not the FRIEND)
- * The visible mini-profile matched this criteria (through a friend)
- * He clicked on the alternate path picture
- * Was miffed/confused with the javascript alert box because the desk was disabled (obsolete)
- * Didn't look at alternate paths, only looked at first "alternate" to complete task

Findings from Task 3

User A

- * started typing for direct marketing, but then saw the viz and used it
- * clicked subtopic, no problems

User B

- * filtered down to direct connections just for kicks
- * used the viz, had no problem understanding the hierarchy
- * saw that the numbers in the results didn't match up with viz but understood that it reflected the filtering.

User C

- * when initially saw the viz, said "oh it doesn't say anything", but eventually used it properly after clarification

User D

- * typed 'direct marketing'
- * looked at the viz, wanted to click on direct marketing, said "I don't really understand this, is direct marketing related to the sub items?"
- * started looking at the mini-profile and saw it was all about direct marketing,
- * didn't notice that the filter was on

User E

- * viz needs to update numbers
- * dragging

User G

- * Didn't use the viz first (searched for it by typing 'direct marketing')
- * Was clicking through people and read the "experience related to..." blurbs
- * Did eventually find the subcategory in the viz
- * Didn't verbalize when he noticed the viz
- * Hierarchy was clear to him: "these are the subcategories"
- * After clicking on a subcategory, would look at the mini-profiles
- * ** after the tasks, said "this was a great way to find a subcategory"

Findings from Task 4

Users had no problem with this task, and so we eventually stopped asking users to perform it after the first few tests.

Findings from Task 5

User A

- * clicked on 'recent searches' but didn't expand 'social networks'
- * searched for 'Lesley'
- * assumed that the first result was the right Lesley because the system would be smart enough to know she's from a recent search
- * had to clarify the task
- * eventually expanded social networks

User B

- * saw recent searches right away, expanded ebooks, then expanded video, then expanded social networks, then saw Lesley Young
- * Then clicked on 6 more results...
- * had no problem with finding Lesley's details
- * didn't think that 'social networks' was a search term

User C

- * thought that maybe the first person would be the most recent search

User D

- * expanded social networks, saw the name but didn't think it was clickable
- * found the phone number with no problems

User G

- * Typed 'social networks', and hit enter. By sheer luck there was a Lesley in the results
- * Went straight to the phone icon and clicked on it immediately, but expected to see a number (obsolete)
 - » (maybe because the map shows you the map?)
- * Kept scanning the mini-profile to try and find a number
- * TASK/WORDING: "you would like to give her a call" is misleading?
- * ** after tasks, he thought that the mini-profile was indeed the profile and didn't think there'd be anything more