

MeetMarket Final Report

Find your crowd™

MEET MARKET

Thomas Schluchter, Dan Byler

Advisor: Coye Cheshire

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Introduction

Networking is one of the most valuable aspects of attending professional and academic conferences. As much as conferences are venues to exchange ideas about a field or advance the progress of a profession, on a very concrete level they are also places to exchange business cards and advance one's own career. At the same time, for many conference attendees, networking is one of the most difficult aspects of the experience. This is because conferences are a very special kind of social setting, each with its own rules, its own hierarchies and its own established communities. MeetMarket is an iPhone application that helps attendees to navigate this social setting with greater ease by putting social information in their hands.

What do we mean when we say “social information”? First of all, we use the term social information to distinguish it from other kinds of “conference information” that are going to be relevant to a conference-goer: maps, schedules, speaker bios etc. These things are (mostly) known beforehand and are part of the official communication. In contrast, social information emerges as the event progresses, and is produced not by the event organizers but by attendees.

Social information lies on a spectrum of availability. At one end is social media: With the increasing use of mobile technology, more and more people are almost constantly connected to the Internet and to the services they use. This transforms the way attendees engage with the conference content and the conference community. During presentations, a constant stream of Twitter messages establishes a backchannel discussing the topic (or, if the presenter is not very captivating, the next coffee break). This information is typically public but can be difficult to digest due to its sheer quantity. On the other end of the spectrum, attendees make choices all the time without necessarily broadcasting them, such as what talk to go to next. This information remains private, yet is socially relevant because it determines where people can find and meet each other.

MeetMarket tackles the information problem at a conferences from both ends of the spectrum. It helps users digest the rich social media content that attendees constantly produce, and it surfaces the less public decisions people make. Social information is information about people's opinions, about their plans and about their connections. Making these three aspects of information about fellow attendees available in conjunction should raise the likelihood of having the productive encounters that every conference-goer is after.

It should be briefly noted what MeetMarket is not trying to do: MeetMarket is no attempt to alter the nuanced social dynamics that comprise a conference experience, nor is it an attempt to coddle users through an “easy mode” conference. Rather, it is a tool to augment the human experience by using technology to understand and present relevant information to the user.

In the following sections, we describe our research process and the design decisions that followed from it. We close with an overview of the prototype and technical implementation.

Research

For the MeetMarket project, we followed a human-centered design approach. We were interested in understanding the problem of networking at a conference primarily from the attendees' perspective, and to build that understanding from the ground up. Our choice of methodology is a result of this prioritization. Conducting a literature review for related projects and for applicable theoretical frameworks helped us make some foundational decisions about the course of the project, but the core of our research is ethnographic. We will briefly summarize the literature review, describe the ethnographic research approach and then synthesize the learnings from both.

Literature review

Live Matchmaking systems

The “matchmaking problem”, or how to bring people together that might be interested in each other, has been tackled by researchers from a number of different disciplines. A sizable subset of this research concerns itself specifically with the conference environment and approaches the problem from a technology perspective. Two good examples of this school of thought are the IntelliBadge (Cox et al 2003) project and MIT Media Lab’s UberBadge (Laibowitz et al 2006) system. Both use physical badges with wireless data transmission capabilities that attendees wear throughout their conference experience. A related approach to matchmaking is presented by MIT Media Lab’s Serendipity system.

IntelliBadge

The IntelliBadge project started in 2001 from the observation that conference attendees “do not benefit from the events as much as they could.” The researchers attribute this to the difficulty of finding others who share similar interests or can provide relevant expertise, and to the inability of conference organizers to act upon or even keep track of themes that emerge during the event. The project seeks to overcome these difficulties by deploying smart badges that track participants and provide “value-added, personalized, location-aware services with the goals to facilitate social interactions and foster social networks among the conference attendees”.

IntelliBadge was deployed at three conferences in 2002. During the live test, several services were made available to IntelliBadge users at both computer kiosks and large displays which were strategically positioned in the conference space. Users could register for the event at the kiosks and access information about conference logistics there. All private information, profile settings and electronic business cards were available at the kiosks as well. The public displays showed more generally useful information such as the number of people in a self-declared interest category attending an upcoming event. The latter focused heavily on playful data visualizations that were supposed to be engaging and informative. (Remarkably, the researchers awarded prizes to the participants who spent the most time in front of a public display.) One of

the visualizations included revealing “a non-critical [bit of] personal information” about IntelliBadge users that happened to be standing near the display at the same time. This feature was to serve the purpose of fostering spontaneous interactions sparked by the random factoid on display.

UberBadge

UberBadge takes the intentions of IntelliBadge a step further. Among its various goals is to computationally infer mutual interest in and existing affiliations between badge wearers on the basis of behavioral measurements. Whenever two UberBadges are in close proximity and pick up on what seems to be an interaction, the system listens in trying to measure how engaged either participant is using speech and movement patterns as indicators. The data generated by these interactions is fed into an aggregating system. This system is also fed with a badge’s location data so that the movements of badge wearers can be retraced. UberBadge uses the cross-section of badge wearers’ movement patterns to determine social network affiliations. The data collected in the process gets used to turn the UberBadge into an interactive display. An example application cited by the researchers was to display a group icon on an attendee’s badge at the end of the day. The group was assigned to the attendee using interest modeling algorithms that ran on the behavioral data collected by the UberBadge. Members of these dynamically created groups could then identify each other, the idea being that this would spark social interactions.

Serendipity

Serendipity, also developed at the MIT Media Lab, is a system built on ideas similar to IntelliBadge and UberBadge. It differs from the aforementioned in its target space and in the way it integrates with existing technology ecosystems. Its primary application is the workplace, where it is supposed to solve the problem of discovering people with desired skills or knowledge. The serendipitous nature of Serendipity stems from the fact that, like the badge systems, it relies on proximity to trigger its actions. Unlike the badge systems, it does not require an extra piece of hardware but runs on people’s cell phones. (For the purpose of the study described in Eagle 2004, phones with pre-installed software were distributed, but it is easily imaginable to port the Serendipity system itself to any Bluetooth-enabled phone.)

The movements of cellphone users are recorded and a network graph of their ‘real’ day-to-day encounters constructed. Based on this information, Serendipity finds people who could act as bridges between isolated networks and alerts them when they are close-by. Similarly, if a user specifies that they are in need of a particular skill, and another user has provided the system with the information that she has this skill, Serendipity alerts both of them as they happen to walk past each other.

Summary and critique

Social facilitation through technology in the conference space has been a research topic for a

number of years. With the increasing feasibility of mobile computing, the attention of researchers has shifted to what can be done with intelligent devices. The review of existing work shows a strong bias towards a certain form of social facilitation. Most of the systems we came across attempt to forge connections between attendees by generating social cues from a mixture of behavioral data and explicit data entry. In our opinion, these approaches disrupt existing paradigms in two areas to a degree that limits their utility and ultimately their success. These areas are technology and social norms.

First, all systems that rely on micro-location, movement tracking or behavior analysis require not only the attendee but also the organizer of a conference to adopt new technology. While wearing a smart badge or carrying an beefed-up smartphone around might be acceptable to the attendee, the organizer incurs the cost of supporting an entire infrastructure on which the system relies. In the work we discussed, this could mean installing big public displays or equipping all rooms of an event location with near-field sensors as well as providing the requisite server capacity to deal with incoming data. Even if such a system works as desired, it is questionable whether it is feasible in the short term to deploy it.

Secondly, and perhaps more importantly, the systems we reviewed have a tendency to impose behavior changes on users. For example, the IntelliBadge exposes information about two people publicly at a shared location with the intention of giving them something to talk about. The underlying assumption is that the people involved are actually willing to engage in interactions with whoever they happen to stand next to. This may or may not be true; one could imagine a socially awkward situation arising from Person A being interested in conversation but not Person B. The same is true for name tags that light up when people with similar interests pass by each other. The technology gives off a cue based on collected data, yet it is the users' responsibility to handle the cue socially. This is exactly the arena where many conference attendees struggle already.

In addition, there is the related question of user control. All three reviewed systems collect and display data fairly autonomously. Some of the papers mention privacy concerns, but there is a greater underlying problem: Either users retain fine-grained control over their data (implying that they are constantly interacting with the system, making decisions about whether to allow or disallow communication), or the system shields users from this level of control (and drudgery), rendering them at the mercy of the system's built-in policies. A system that presents you with these choices might not be optimally suited for a conference setting where both time is precious and social stakes are high.

Social Practices

In the bigger picture, trying to influence social practices through technology in specific ways strikes us as a problematic approach to solving user needs. That is why we looked into other literature that focused on current practices that we might use as a lever to support better outcomes. There are two components that stood out as particularly relevant: The use of social

media in conferences and the implications of dealing with a huge number of strangers in a staged setting.

Use of Social Networking tools at Conferences

According to a study conducted in 2010 using the data from three different conferences, Twitter data is highly indicative of the activity at an event (Stankovic 2010). For example, it was discovered that 85% of the tweets sent by conference attendees were actually conference-related. The authors describe a method for mapping individual tweets to events and sub-events based on computational semantic analysis methods. In short, for conferences whose attendees use Twitter, there is a rich and highly relevant backchannel of information that can be automatically processed.

The familiar stranger

Paulos and Goodman (2004) describe the phenomenon of ‘familiar strangers’, individuals whom “we repeatedly observe and yet do not directly interact with”. We encounter these familiar strangers in our everyday environments, while commuting or strolling about in the neighborhood. Under normal circumstances, social norms inhibit interacting with these strangers, but a change of context can tear these barriers down. Imagine, for example, a commuter who takes the same train from San Francisco to work every day. In all likelihood, he will recognize a number of fellow commuters’ faces after a while. As long as none of these people have a personal connection with our commuter, there is no reason for them to interact with him. Yet, if he were to run into one of those people while vacationing in Italy, the “non-interaction rule” (Paulos and Goodman) would be overridden. Social protocol is suspended because the event itself (meeting someone from San Francisco in the subway of Rome) is so out of the ordinary that both people feel compelled to act on the mutual recognition.

‘Socio-metric stars’ are a subgroup of the familiar strangers. Socio-metric stars are individuals who “stand out in a community or group and are readily recognized by an extremely high percentage of people.” Our relationship with a familiar stranger and our relationship with a socio-metric star are different insofar as there is a prominence differential between us and the socio-metric star that does not exist between ordinary familiar strangers.

Following Paulos and Goodman, familiar strangers are socially layered between those we know and those who are perfect strangers. They create a feeling of familiarity with the environments in which we cross their paths. They are, in a sense, landmarks in our social topography. Viewed in the staged social setting of a conference, this concept can be very powerful. Relationships with familiar strangers serve an important social-psychological purpose in that it is comforting to recognize a face without a social obligation to interact. But these relationships take time to develop under normal circumstances. Consequently, apart from prior acquaintances (such as colleagues and friends) and socio-metric stars (e.g., the famous keynote speaker or the well-known blogger), the majority of attendees are going to be perfect strangers to each other.

This is particularly interesting because conferences are meant to be networking events, and thus require perfect strangers to leap the barriers of social norms. If we think about conversations needing both a **context** (a socially appropriate setting) and an **anchor** (a mutually acceptable reason to engage), we can see that conferences are designed to provide the context for these interactions. But what about the anchors? We see the concept of the familiar stranger as a key element in our strategy to foster social exchange at conferences. If we manage to turn perfect strangers into familiar strangers, and give attendees barrier, we can lower the barriers of interaction. Furthermore, if we can identify the “right” strangers to turn into familiar strangers, we can improve the chances of those interactions being meaningful.

Ethnographic research

We conducted two phases of primary research: participant interviews and diary studies. We interviewed six people for 45-90 minutes, each with recent conference experiences. In addition, we recruited six attendees of the 2011 Interaction Design Association (IXDA) Conference in Boulder, CO and the iConference 2011 in Seattle, WA to participate in a diary study. Finally, we participated in numerous informal conversations with conference-goers and at conferences we attended.

Methodological remarks

During the interviews, we employed techniques such as probing and mirroring phrases to elicit the richest possible meanings of peculiarities of expression or any other conversational item that caught our attention. Interestingly, one can only probe so deeply before hitting the ground of the interviewee’s conceptual construction. In every conversation, people said at some point: “I haven’t really thought about that...”, after having attached some kind of label to a concept that we were interested in.

For the diary studies, we sent out an open call for participation to a UC Berkeley School of Information email list and to the IXDA mailing list. Among the many respondents, six were selected to represent different levels of conference experience, from first-timers to old hands. Participants received a package containing a journal, a disposable camera, and a variety of writing prompts on stickers that could be pasted into the journal. The described task was very open-ended: Participants were asked to take note of their conference experiences, both good and bad. Anything they found remarkable or noteworthy could be included. Each participant received a monetary reward upfront. Throughout the duration of the conferences, we sent SMS reminders and Twitter direct messages to keep the participants motivated. In the end, four of the diaries were returned to us.

Although the interviews and diary studies differed in format, we used affinity diagramming to analyze both. Affinity diagramming is a powerful way to visualize themes and meta-narratives that thread their way through user research (Kuniavsky 2003). For each interview, we listened to our recording of the conversation, paying special heed to concepts and ideas mentioned by

the participant. Suspending judgment about what themes might be important, we then illustrated each concept on a Post-It note and placed the note on a large wall-like surface. As the process progressed, we moved the notes in order to form clusters of related concepts. In the end, the affinity diagram's theme clusters reflected the interviews and diary studies, providing both a high-level conceptual overview of the research and detailed concept descriptions.

See Appendix A for a sampling of clusters and insights.

Analysis

The stories we heard and read were very different, as participants ranged from first-timers to seasoned professionals, and from academics to business people. Yet they all spoke about the experience of learning the ways, of the intimidating feeling to be alone among experts, and also about the gratifying feeling of belonging somewhere. It is in the threads running through these very different stories that we see the essence of the conference experience: an exercise in finding one's place.

Finding one's place begins with the very basic notion of orientation. Beyond the metaphorical concept of orienting oneself in a professional field, there is a very literal aspect to this: conferences produce a feeling of being lost. They are typically hosted in utilitarian venues with "bland locations where attendees are supposed to go and network" , or, as one participant put it: "Large conferences tend to be faceless. Just vast." The newcomer, perhaps at his/her very first conference, is confronted with a sea of people who all seem to have a purpose, who know what they are doing. In comparison, the newcomer feels incompetent and misplaced. Why am I here?" was a common question for all interviewees, not only at the very first events in their career, but each time they took on a new conference.

One interviewee compared the newcomer's experience with establishing a new commuting routine after a move:

"You have this new job... You live in place A, and you have to get to place B. You have no idea how to do it. So you overplan. You research the route, you figure out where the bus is, you buy your crazy bus ticket, and it's got too much money on it because you want to be sure. You got all your maps and all your crap, and you go and you do it your first time, and you get lost. It's really frustrating. And you don't know how to signal a stop. "Oh god, that was totally awful! Everyone knew that I was this jackass..." You do that, finally it's done. And you go home and do it in reverse. But then the next time you do it, the next day, you have this experience, you have it under your belt. And you don't have to do the map stuff anymore. You find your way with a little bit more knowledge and a bit more confidence. Conferences are exactly the same way. The first time you go, it could be a specific event or just your first professional conference you've ever been to. You're going to clutch at the program; you're going to clutch at the crazy maps. You're going to ask "Where do I go, when do I go there? Who are my friends? Who are my enemies?"

This excerpt speaks to many of the key themes that we've come across. There's the anxiety

expressed in the desire to control the experience, the frustration of getting lost despite one's best efforts, the overly conscious self-reflection, and finally the realization that experience is the only thing that really helps feeling comfortable in this situation.

But what is it that makes it so uncomfortable in the first place? The feeling itself seems to run deeper than the ordinary awkwardness one might experience in other social situations, for instance at a party where everyone is a stranger. The terms that people used ranged from "intimidating" to "It's terrible. One of the worst experiences I've ever had". What differentiates a conference from the aforementioned party is the pressure resulting from the professional setting. Suddenly, "the way you carry yourself" becomes much more important because you're exposed to scrutiny by people in a field that you want to gain traction in. Underlying the anxiety is partly the fear of misstepping in this high-stakes situation. Another part is constituted by the nagging feeling of wasting one's time attending the wrong sessions and talking to the wrong people. Avoiding the boredom that uninteresting talks and shallow conversations bring is very important for attendees' perception of success.

The reason for this lies in the expectation of the value that ought to be extracted from a conference. A common mistake among newcomers is to believe that the value lies in the event's content. Invariably, every interviewee brought this up as a lesson learned after attending a couple of conferences: The important stuff happens "in the spaces between". It is the hallway conversations, the after parties, the semi-formal questions after a sessions that make the conference experience what it is. Precisely because of this, the newcomer will always feel lost. He/she is not yet embedded in a network of people that provides access to other networks.

Using the complex of social interaction as a lens, we analyzed our affinity diagram for **pain points** (areas of expressed frustration), **aspirations** (what participants hope to gain in a conference experience), and **success factors** (elements that contribute to the conference-goer's belief that the conference was a success). These concepts, listed in the following, underly and inform our design decisions.

Pain points

- Useless conversation (it is frustrating to waste time in undesirable conversations)
- Getting the "in" (it can be difficult to successfully introduce oneself or be introduced)
- Lack of parity (disparity in social status can be an impediment to making connections)
- Limited time → High cost to wasted time (every minute is valuable at a conference)
- Competition for interest ("high-value" individuals are rarely available for conversation)
- Too many impressions to productively retain (even good conversations can be difficult to remember in a high-bandwidth networking environment)
- Horror of organized networking (formal networking can seem awkward and contrived)
- Feeling alone (being in a sea of strangers can feel alienating)
- Strategize & extract value at the same time (there is a constant tradeoff between planning

- and experiencing)
- Invisible social barriers (what are the specific challenges to overcome in making a connection?)
- Organizing follow-up (once home, how to effectively sort the stack of business cards?)

Aspirations

- Have productive conversations
- Enhance your reputation
- Meet people on all levels of social hierarchy (seeking both immediate and future value from networking)
- Learn (from organized sessions, fellow conference-goers, et cetera)
- Feel as part of a community (find one's place in the sea of faces)
- See and reconnect with friends

Success factors

- Break down formality (tactics included leaving the conference space for coffee; strategic use of the cigarette break; skipping sessions in favor of hallway conversations; and focusing on after-parties)
- Gaining experience (e.g., through repeated attendance of the same conference)
- Being known (finding ways to be connected with specific fellow attendees)
- Being involved (facilitating sessions, serving on committees, volunteering, etc.)
- Suppress your fears (“just say hello”)
- Prepare (know who is attending and what sessions to attend in advance; contact specific individuals beforehand to schedule coffee)
- Participate in backchannel (active use of Twitter can lead to name recognition and spur connections)
- Prioritize for value (experienced conference-goers prioritize networking over content)

Concepts

From the combination of literature review and primary research, we identified several guiding concepts to clarify the issues surrounding conference networking.

Clique versus Crowd

Because people are most comfortable being with those whom they are familiar, conference-goers associate most heavily with people they already know. Frequently, this leads to **cliques** forming between groups of people who know one another. While cliques are useful in providing stable social structures for their members, their primary benefit is familiarity, not effectiveness in networking. Our research participants have mentioned that they constantly

float in and out of their cliques over the course of the conference. While successfully networking offers significant benefits to attendees, it is also a stress factor; “decompressing with friends”, as one participant put it, is an important function of cliques.

In contrast to the socially established clique, we use the term **Crowd** (frequently in conjunction with an individual, as in “My Crowd”) to describe a set of conference-goers who have something in common and can productively interact with each other. Each conference-goer has a crowd of fellow attendees that comprises, to use the expression of an interviewee, the “5% of actually useful people”. While the attendee might know about some of these people, most of them are going to be strangers to her. The challenge is to identify people who might be in an attendee’s crowd and to help her connect with them in meaningful ways. One first step is to turn the perfect stranger into a familiar stranger. MeetMarket tries to facilitate this process by augmenting the user’s conference experience with social information wherever possible.

Social Makeup of Conferences

A conference is comprised of various subsets of attendees with whom an individual attendee could relate. The further away from the center, the less likely an interaction becomes as there are fewer incentives to connect. Orthogonal to the progression of social distance described by the circles are three salient uncertainties that an individual faces with regard to members of these circles:

- Who are they?
- What are they up to?
- How are we connected?

“Who are they?” is the most basic uncertainty and relates to extracting a relevant subset from the mass of all attendees. This uncertainty is addressed by looking at implicitly or explicitly stated preferences of individuals and matching them up against each other. Those with higher similarity scores are assumed to more likely be a member of an attendee’s crowd.

“What are they up to?” is a question that arises when a subset of attendees is identified. Because the goal of MeetMarket is to facilitate productive encounters, it is critical to put information about an attendee’s crowd into his hands. By surfacing what the crowd plans to attend and what they have to say about it, we enable the attendee to base his decisions on socially relevant criteria.

“How are we connected?” is an uncertainty that is relevant on the individual level. A person being a member of someone else’s crowd means that there is some measure of similarity between them, whether it be a common interest, subject of research, or social connection. But for the purposes of initiating a social interaction, this similarity needs to be translated into something concrete—something that can break the ice and gets a conversation going.

Social risks

Based on our research, we identified several different categories of risk associated with social interactions in the conference environment. These are:

- wasting time (engaging in unproductive conversations or conversing with undesired individuals)
- “missing out” (not meeting the right person);
- rejection and social awkwardness
- losing track (failing to properly follow up with someone)

Figure 1 shows the distribution of these risks across the different social groups identified above.

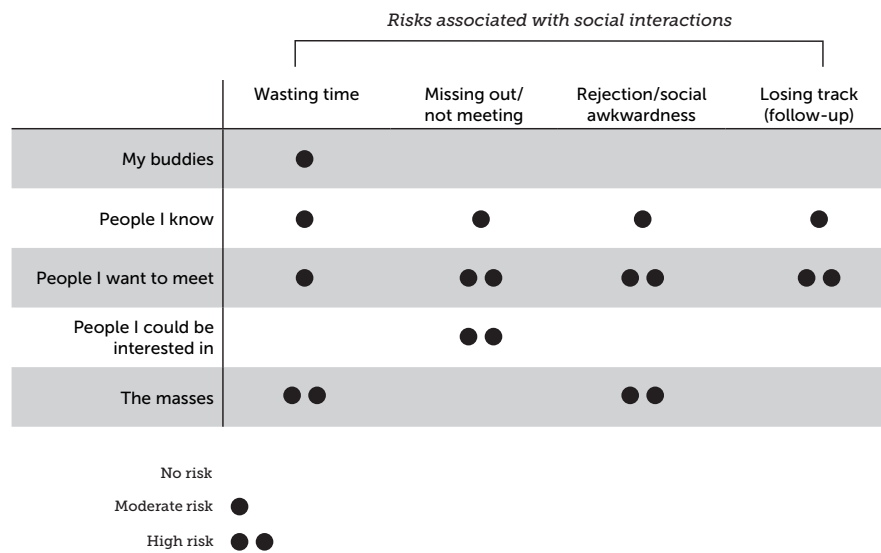


Figure 1

Design approach

Framing the problem

In order to focus on the most relevant parts of the application, we narrowed down the problem space described by our research to a set of workable concepts through a four-step reduction process. These steps were as follows:

- Classify user needs into facets
- Cross-tabulate facets
- Generate need statements
- Analyze and reduce results

Classify user needs

During our user research, we identified high-level user needs on two dimensions. The first dimension comprises the pain points, aspirations, and success factors detailed earlier.

In addition, we identified a set of five nonexclusive categories to further describe each user need:

- Value statement (relating to the perceived value of an interaction to the conference-goer)
- Psychological (relating to intrapersonal barriers to networking)
- Interpersonal (relating to real-time interpersonal interactions)
- Community status (relating to status and power dynamics within the community of conference-goers)
- Information deficit/cognitive overload (information issues, whether lack of knowledge or information overload)

Each user need could belong to one or more of these broader categories.

Cross-tabulate facets

Next, we counted the number of user needs in each facet and cross-tabulated the facets to identify which facets were most prevalent, and to what extent they overlapped. This enabled us to see the types of user needs in aggregate, and to begin to understand subtextual relationships and patterns.

Generate need statements

We next generated a generic user persona, Ceegee, to represent a representative conference-goer: someone without a tremendous amount of clout in the community, who may have attended this particular conference once or twice but is hoping to maximize the value of the

conference experience. Using the Point-of-View technique, we generated a user need statement to contextualize each user need from her perspective. The statements follow this format:

[stakeholder] has [a need] because of [surprising insight from research]

For instance: “Ceegee needs to connect with other people at the conference because the stigma of being a loner makes her socially unattractive.”

We then mapped these statements back to the master User Needs list in order to ensure that all the needs are addressed in a Need Statement.

Analyze and reduce results

Finally, we revisited the User Need classifications in light of our design decisions in order to eliminate User Needs that are outside the scope of technology to meaningfully address. For instance, community status issues play an important role in determining the character of specific networking interactions, but these issues are also the most difficult to address with technologies. Researchers speak of a “socio-technical gap” , a great divide between the nuances of human interactions and needs and the blunt edge of technology. With this in mind, we elected not to address user needs that are primarily related to Community Status or “In My Head” .

Design Principles

Over the course of our research and design, we identified a number of principles to keep our design in line with the findings from research.

1. Utilize a context-appropriate model of engagement with the app.
2. Facilitate offline interactions, not online interactions.
3. Don’t try to manage the “last mile” of social engagement: people still need to interact face-to-face.
4. Don’t interfere with existing community dynamics.
5. Allow users to get in and out of tool quickly so as not to distract from the conference.
6. Provide immediate value to users, even if they are not interested in social features.

The ramifications of these design principles are broad. For example, incorporating overt game mechanics into the system would violate principles 1 and 4, and possibly 5, so we ignored solutions that required heavy-handed game mechanics.

Problem statement

Considering the user need statements in conjunction with our design principles, we framed our design problem as such:

We want our users to have big ears. We want them to “hear” the most useful information *to them* in order to maximize conference experience *for them*. To this end, we will create a mobile application that will help users filter the conference experience through the expressed preferences and discussions of their crowd. By identifying the sessions and discussions of interest to their crowd, users will be able to make more informed decisions to maximize their own experience.

Practically speaking, MeetMarket will combine a recommender engine with conference and social data in order to provide logistical and social information to users.

UX design and prototyping

Everything that diverges must converge

Starting from the need statements generated in the synthesis sessions, we conducted several ideation sessions in order to identify possible design solutions for each user need. Initial ideation sessions were characterized by a divergence of ideas: that is, they were planned to maximize the number of possible options without regard to feasibility. Failing to perform value-free ideation can lead to premature dismissal of viable concepts due to their unfamiliarity or lack of precedent in existing solutions. Some of the solutions proposed during these sessions included using subliminal messaging to artificially create a “familiar stranger” effect (in order to reduce personal anxiety), or creating a point system to reward certain types of social interactions (in order to mitigate some of the undesirable effects of community power dynamics). These whimsical examples did not make it into our final design but served the important role of maximizing the range of possibilities under consideration.

From these divergent sessions, we drafted low-fidelity paper designs of the more promising ideas. Again, divergence was key: some ideas were instantiated in radically different design sketches in order to keep options open for possible implementations.

One hallmark of good product design is focus, and no product can incorporate all possible solutions. Therefore, it is a *convergent* process which gives meaning to divergent ideation. In this stage, we ruled out ideas that conflicted with our design principles (e.g., as mentioned above, overt gamification conflicts with Principle 4, *Don't interfere with existing community dynamics*). Next, we explored various combinations of ideas to identify those which could align to form a coherent user experience. Additional paper prototypes followed before we settled on a final conceptual design in the form of wireframes.

Final design

We designed MeetMarket to be a mobile application that provides three layers of information to users:

- Conference information (CI)
- Backchannel information (BI)
- Recommendation information (RI)

Conference information forms the scaffolding for the conference experience by providing the static information that forms the basis of a conference. This includes information about the conference schedule, venues, and attendees. Conference information is needed to ensure MeetMarket is immediately useful to any user (Design Principle #6). Using it, our conference-goer can browse events and create a personalized schedule by flagging sessions of interest. She can also browse and search the attendee list in order to identify persons of interest. From our survey of conference product space, provision of basic conference information is the extent of functionality of most existing conference apps.

Next, MeetMarket provides **backchannel information** to augment the basic conference information. We provide an interface to view conference-related Twitter conversations, as well as ways to view session-specific discussion (provided that a hashtag is in place for the session). In the future, we intend to also provide anonymized location-specific information to identify social check-ins, such as those with Foursquare to help users decide which after-hours events to attend.

In our competitive analysis, we have seen only a handful of conference apps which provide backchannel monitoring, and most of those do not provide session-specific monitoring. We believe providing access to the current backchannel information on a given session will provide greater insight into the conference and may help conference-goers make better decisions about how to spend their limited time.

At a large conference, the sheer amount of information available—both conference information and backchannel information—can be overwhelming. This is where the MeetMarket **recommendation information** comes in, helping to refine the conference information to that which is most relevant to a specific attendee.

To generate recommendations, the MeetMarket Engine first analyzes all available information about the conference attendees. Using self-identified profile information, as well as information from the users' online presence, the recommendation engine creates a similarity ranking between each pair of attendees. For each user, the set of users who share the most in common become his or her Crowd, which is a way of identifying those people he or she is likely to have something in common with. To mitigate privacy concerns, social information is provided on an opt-in basis; for example, users must intentionally link their Twitter account to the app in order to use Twitter as a recommendation source. Also, the MeetMarket user could customize her crowd at any time to add or remove specific people of interest.

Using information about the user's crowd, MeetMarket filters Conference Information and

Backchannel Information in order to highlight the most socially relevant information. For instance, when browsing through the conference schedule, a MeetMarket user can instantly identify which events have been flagged by other members of her crowd—thus identifying those sessions where she is most likely to meet these people. Similarly, the backchannel information can be filtered by her crowd, so she can quickly see what sessions, topics, and after-hours events are being discussed by these people.

This recommendation feature is rarely found in the current range of conference apps. We believe it will help refine the conference experience from one that may be overwhelming to one in which the attendee feels informed and empowered. Using MeetMarket, the attendee stops asking “Where am I going?” and starts asking “Whom am I meeting?”

But MeetMarket goes beyond this purely informational approach. A recommendation feature still leaves individuals with the problem of locating and identifying recommendees in a sea of strangers. Using what we call FaceCards, we seek to make this a smooth experience. FaceCards are a flashcard-like interface that helps attendees learn to recognize people of interest. Along with an attendee’s face, names and other helpful factoids are displayed. The user is tasked with associating the right name and the right factoid with a face. Correct guesses earn the user points, and after recognizing the same person three times, this face gets added to the user’s Face Gallery. To incentivize attendees to play from time to time, their score is displayed in relation to the average conference-goer and the current leader.

The selection of people to display in the FaceCards section initially comes from the recommendation system. That way, the user becomes familiar with people that might be of interest based on shared interests. We also want to give the user a choice in the faces they learn. While users can indicate that they know the person displayed (or are not interested in learning this face) when viewing a FaceCard, they can also manually add other attendees from their attendee profile card.

We believe that FaceCards provide a very specific function. By turning perfect strangers into familiar strangers, they increase the chance of a serendipitous interaction between two people. We believe this will help conference-goers in networking situations, as they will have the opportunity to recognize and approach people who are interesting to them.

Technical approach

The MeetMarket service design architecture consists of two related systems. From the user's perspective, the MeetMarket iPhone application ("MeetMarket App") is the sole front stage interface. All user interactions are currently designed to occur on the MeetMarket App, from browsing the conference attendee list and schedule to storing user notes or browsing FaceCards to learn names.

The backstage services (collectively referred to as the MeetMarket Engine) include a CouchDB-based data store and a set of recommendation and synchronization daemons written in Python. These daemons interact with external services (for example, searching Twitter for conference-related tweets) and perform relevant recommendation functions for the user.

MeetMarket App

Platform selection

Our decision to develop for the iOS platform was partly a response to industry trends and partly a personal decision. Most mobile applications are deployed to iOS before other platforms, in part because of the savvy, deployed iOS user base, and in part because of the more mature development tools available for iOS. As neither of us has developed for mobile devices before, the stronger development tools available for iOS made it an attractive choice.

However, the decision to develop for iOS is a first step, not a long-term strategic decision. When MeetMarket is ready for deployment, it will be relatively cost effective to generate an Android or web-based app from the fully specified iOS version, so platform restrictions will not be a long-term impediment to MeetMarket's adoption.

A variety of development frameworks are available for iOS development. While the traditionally preferred option is develop "native" iOS apps in Objective-C, a number of alternative options exist for iOS development. In conjunction with a multi-criteria decision analysis tool called roominds, we decided to work in native Objective-C. (For more information, we describe our decision-making process around this technical decision in Appendix B.)

Operation

The MeetMarket iOS App operates as a client of MeetMarket Engine. Upon launch, it downloads new data from the data store, allowing the user to work with the full speed of local data. A synchronization process periodically sends updates to the data store and fetches new information, ensuring each handset reflects the latest data on the server.

MeetMarket Engine

Tool selection

The MeetMarket Engine data store is based on an instance of CouchDB, a non-relational database belonging to the NoSQL family. We selected CouchDB for a variety of features that are important to MeetMarket:

- CouchDB can handle arbitrary data types. Any JSON object can be efficiently stored and retrieved in Couch.
- CouchDB is designed for massively scalable web applications. Replicating CouchDB databases is simple and seamless, so risk of downtime or data loss are extremely low.

Our recommendation and synchronization daemons are written in Python, a language that enjoys wide support in the web development community.

Operation

MeetMarket daemons currently perform the following functions:

- Query data store for updated data
- Perform calculations to generate My Crowd recommendations for each user
- Fetch real-time conference data from Twitter

Future improvements of the MeetMarket daemons will include interacting with other online services (e.g., LinkedIn, Foursquare, JSTOR, etc.) to generate richer My Crowd recommendations.

Results

MeetMarket exists to facilitate better conference experiences through better informed attendees. We have designed a tool that takes overlays backchannel information on the conference information typically provided in a conference app, and refines that information based on user-specific recommendations. By incorporating a focused feature set with a robust background intelligence, we believe MeetMarket will mitigate attendees' conference pain points, address their aspirations, and strengthen the success factors. Here are a few ways MeetMarket addresses these user needs:

Pain point: It is difficult to strategize and extract value at the same time. **MeetMarket solution:** Provide better information to the user through MeetMarket recommendations in order to minimize the time needed for strategizing and maximize the attendee's opportunities to meet the right people.

Pain point: Too many impressions to productively retain. **MeetMarket solution:** Help users to identify persons of interest (by overlaying the user’s Crowd) and create opportunities to become familiar with them (through FaceCards) so the user can make better use of networking time. More targeted networking means a higher percentage of conversations will be memorable.

Pain point: It can be difficult to organize follow-up. **MeetMarket solution:** By identifying points of commonality between users and allowing users to enter notes, sorting business cards at the end of the conference can be done in the context of more useful information.

Pain point: Attendees can feel alone in a sea of faces. **MeetMarket solution:** Although technology will never fully resolve this social issue, we hope to alleviate it by using FaceCards to create a sense of “familiar strangers” among people who haven’t yet met.

Aspiration: Attendees want to have productive conversations. **MeetMarket solution:** By highlighting points of commonality between the MeetMarket user and other conference attendees, MeetMarket helps users identify commonalities that can be launchpads for more productive conversations.

Success factor: Good preparation. **MeetMarket solution:** Overlaying social recommendations on conference information means users can more effectively prepare for the conference sessions and interactions that make the conference meaningful.

Success factor: Participate in the backchannel. **MeetMarket solution:** Provide easy access to the wider conference backchannel, as well as the session-specific backchannels that form throughout the event.

Limitations

As we have discussed, there are a variety of user needs that cannot be solved with technology, and we make no claim to address these with MeetMarket. Among these are psychological (e.g., suppressing one’s fears to talk to strangers), interpersonal (e.g., breaking down formality, getting out of undesirable conversations, lack of parity in social standing), and issues of community status (e.g., enhancing one’s reputation). It is unlikely that these issues will be addressed technologically, but we believe the features MeetMarket offers will have a measured impact on the value users get from a conference experience.

Future work

We see the future of MeetMarket evolving in several directions: increasing its utility and increasing its availability.

Increasing the utility of MeetMarket would occur according to this rough feature plan:

- 1.0 changes
 - Improve login/signup workflow
 - Add additional data sources for making recommendations
 - e.g. citation mining
 - JSTOR
 - LinkedIn, Facebook, etc
 - Monitor Foursquare checkins
 - Build a smarter recommender to take into account things like Event starrings

- 2.0 changes
 - Ability to persist beyond single conference
 - Build persistent identity
 - Move beyond a Twitter-dependent backchannel; facilitate MeetMarket-based backchannel with possibility for anonymous discussion
 - Create API to tie into 3rd party registration systems

Finally, to increase availability of MeetMarket, we would need to create a Web-based version to run in any smartphone browser.

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Appendix A: Research Clusters

Every conference is a different beast

Participants described a dramatic range of conference characteristics, highlighting how different each is from the next. While some people described the “personalities” of conferences, others spoke of “hilarious and overwhelming” conferences where “1,000 attendees is small”. In a “home turf situation” attendees feel empowered for interactions and “getting to work”, but in large conferences we heard about a tendency to “hang around”.

Every conference is the same

Numerous participants spoke of limited time available at conferences, “opportunities present themselves all the time”.

Pre-planning

Pre-planning was described as both a success factor and a point of frustration for attendees. While participants wanted to network before getting to the conference, one spent a frustrating 36 hours trying to plan her event.

Face-to-face networking

While one can assess a potential interaction by the other person’s “approachability vibe”, one still “needs to have something valuable to say”. Introduction methods ranged from “just say hello” to the “wounded duck introduction” (“I hate networking!”). Props (business cards, empty coffee cups) can help end awkward interactions, and this will always be needed as “we need a *reason* to connect”.

Value of interactions

Conversations cannot always be taken at face value: awkward conversations can be valuable in the long run. And simply “acquiring contacts” with a “shotgun” business card approach can lead to questionable value. Uncertainties were echoed throughout, though: over time a seemingly trivial contact could become valuable, a contact perceived as valuable could be forgettable.

Expert strategies

Participants described a wide range of what we call expert strategies, from avoiding bad sessions to finding the right friends.

Backchannel

The Twitter backchannel embodies a range of discussion, from discussion of current events to collective decision-making for “the next thing”. Further, the possibility for attribution leads some to use Twitter as a way to gain traction in the community.

Internal barriers to networking

Participants describe feeling “out of place” or like they had “no business” being there. Formal socializing can be awkward, particularly when it leads to wandering around in search of conversation partners.

The “newbie” experience

First-time attendees at a conference feel “lost” without knowledge of the “invisible protocol” that drives social interactions at that conference. So they “clutch to the crazy maps” while trying to navigate.

Social dynamics

Social interactions are challenging for a variety of reasons. The social landscape is comprised of members of various status levels—“heroes and losers”, in one participant’s words—with everyone competing for the interest of the heroes. Having little of interest to say can lead to social fall-out, but the alternative could be worse: don’t “express how lame you are” by not talking to anyone. Standing back outside a conversation circle is “ugly and awkward”.

Networking in practice: Serendipity

Serendipity was mentioned numerous times: overhearing a conversation leading to a shared connection; running into a high school friend in the coffee line. Listening for these moments is key.

Networking: Middle-man

Meeting people through an introduction was cited as a factor for success. Yet introductions are tricky as well, and can reflect well or poorly on the introducer; said one: “I’m not burning *that* bridge!”

Space/logicstics

Context makes a big difference for networking. Planned networking in a hotel ballroom is “forced” and “awkward”, but after-parties are more natural for making connections.

Appendix B: Selecting a platform using MCDA

With prototyping rapidly approaching, we decided to revisit our earlier decision to program MeetMarket as a fully native iOS app. Although we still intend to target iOS first, the ultimate success of MeetMarket depends on wide-scale adoption, which means being available for Android as well.

Native iOS, PhoneGap, Rhomobile, or Titanium?

Options abound for developing apps for iOS. In descending order of “nativeness”, here are the platforms we considered:

- Native iOS developed in Objective-C
- Hybrid iOS app (native wrapper for web content)
- Third-party development frameworks (Rhomobile and Appcelerator Titanium were at the top of our list)
- PhoneGap (natively encapsulates web apps)
- Web app

We ruled out Rhomobile and Appcelerator fairly quickly, despite their purported advantages (most notably: cross-platform builds). Appcelerator has its own IDE, which we found lacking in some ways and strangely over-developed in others (why does it have Twitter and Friendfeed built in?), and Rhomobile’s showcase has exactly zero apps that we find satisfactory from a design/UX perspective.

This left us with four options, which we ranked on the following criteria:

- Effort to deploy cross-platform
- Speed on device
- Ease of integration with other systems/services
- Access to device-specific capabilities
- Anticipated frustration learning/developing
- Coolness factor
- Personal pride factor

But how to weigh the possible decisions? Even understanding how each option stacks up with these factors gives us little means to *make the decision*.

Selecting a platform using MCDA

Multi-criteria decision analysis describes a variety of techniques to analyze alternative options by weighting decision factors. [roominds](#) is a tool we used to facilitate this process. roominds walks users through the process of defining and ranking decision-making criteria in order to elicit true weighted preferences with respect to these criteria. It also allows users to specify a set

of alternative options, which it ranks against your stated preferences. Here is the general workflow:



The real magic of this method is that the preference ranking process occurs through a [series](#) of [pairwise choices](#), allowing users' true preferences to emerge through a series of simplified decisions.

1000minds®

◀ back to models / processes (home)

Which of these 2 (hypothetical) alternatives do you prefer? (Left, Right or equal?)

(given they're identical in all other respects)

<p>(Left)</p> <div style="border: 1px solid black; padding: 5px; background-color: #ffffcc;"> <p>b Effort to deploy cross-platform already cross-platform, no real effort</p> <hr style="border-top: 1px dotted black;"/> <p>c Coolness factor meh</p> </div>	or	<p>(Right)</p> <div style="border: 1px solid black; padding: 5px; background-color: #ffffcc;"> <p>b Effort to deploy cross-platform full rewrite required</p> <hr style="border-top: 1px dotted black;"/> <p>c Coolness factor cool!</p> </div>
<input type="button" value="this one"/>	<input type="button" value="they're equal"/>	<input type="button" value="this one"/>
<input type="button" value="this one is impossible"/>	<input type="button" value="skip this question for now"/>	<input type="button" value="this one is impossible"/>

85% done (251 of 297 potential questions) *

Our criteria ranking revealed that, for example, device performance was an important factor for our choice, and accessing device capabilities is relatively unimportant for this project (location awareness, the most important device information, can be exposed even to a web app, making this a moot issue).

It should be noted that the preferences surfaced through a tool like roominds are fully subjective, and their application is just as important as their ranking. For instance, we personally decided it would be more gratifying to develop in native Objective-C than using

HTML/CSS/JavaScript in PhoneGap, so the 'pride' factor works in favor of native development *for us*.

Finally, applying these weighted preferences to our available choices confirmed our original preference to develop natively:

CRITERIA										
<input type="checkbox"/>	ALTERNATIVE click to open	Speed on device	Effort to deploy cross-platform	Coolness factor	Personal pride factor (looking back)	Access to device capabilities	Anticipated frustration	Ease of integration with other systems/services	RANK	TOTAL SCORE
<input type="checkbox"/>	Native iOS	zippy	full rewrite required	cool!	high	all	high	not possible	1 st	79.2 %
<input type="checkbox"/>	Hybrid App	decent	some adaptation needed	meh	medium-high	some	medium	possible but challenging	2 nd	64.6 %
<input type="checkbox"/>	PhoneGap	decent	already cross- platform, no real effort	meh	medium	some	low	possible but challenging	3 rd	53.1 %
<input type="checkbox"/>	Web app	sluggish	already cross- platform, no real effort	lame!	medium	none	low	easy	4 th	38.5 %