Coming to Terms: Interaction Principles for Negotiating Privacy in the Connected Workplace

A Thesis Submitted to the Faculty of the

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Dedication

To my mother and father: without your rearing and support, I wouldn't have the maturity, education, and stick-to-it-ness to complete my academic pursuits from pre-school to this thesis.

To my wife, Nicole: without your empathy, intelligence, endurance, and sacrifice, I would have never dared to truly seek my occupational calling and return to school.

To my son, Elliott: without your inquisitive and persistent character, I might have knocked this thesis out in half the time—but with a fraction of the purpose.

Acknowledgements

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I would also like to thank my thesis committee members, David Meyers and Stokes Jones. Your guidance in my non-thesis classes was a boon to my success, and I received this same benefit again by having your guidance applied to my thesis project.

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Abstract

More and more, businesses are looking to their massive stores of data regarding workplace behavior as an opportunity to better understand their organization, monitor its performance, and optimize its workforce and processes.

This is not a new notion, but the present revival of optimization based on rigorous, quantitative observation brings with it an unprecedented amount and granularity of data. Furthermore, technologies and services are beginning to surface that are capable of trawling massive data stores and building ontologies for the purpose of business strategy.

However, such systems bare cultural connotations of oppression, coercion, and privacy invasion—rightfully so, given the unflinchingly bottom-line driven climate of US business, the widening class gap, and daily headlines regarding the NSA surveillance program. If workforce surveillance is going to be genuinely successful, one of the primary challenges it must negotiate is that of an established and expanding distrust amidst employees.

My thesis project is a digital user interface prototype for a workforce tracking system that affords users the ability to manage their level of participation. The design of this UI supports and manifests principles of transparency, privacy, human autonomy, co-determination, and negotiation. The hypothesis of my project is a user interface that is transparent and democratic in its interactions regarding workplace surveillance will result in users being more responsible regarding their personal data as well as more altruistic in volunteering personal data for use by their organization.

Chapter I: The Data-Driven Human Resources Department

With the rise of cloud computing and the proliferation of mobile devices, a rapidly increasing number tasks executed by employees have digital, online touch points. A result of this trend is a multitude of data streams buzzing with tertiary data—also known as "data exhaust". When captured and processed, this data can speak volumes about the employee and about what they are doing, when they are doing it, where they are doing it, and how they are doing it.

This is surveillance, and it is at a level of unprecedented granularity. Traditionally, surveillance deployments in the workplace have been installed primarily as a means of control and prevention of behaviors that negatively impact the organization. However, there is a growing trend that has a much more positive bent. It still has the interest of the organization in mind, but there is now a notion that this data-driven surveillance can be used to find ways for work to be more enjoyable or to even empower the workforce with a better understanding of how it operates. But, to be sure, even with positive, employee-centered motives, surveillance brings with it a gravitas and an inherent concern regarding the privacy and dignity of individual employees.

Current & Near Future Deployments of Workplace Surveillance

An excellent, recent example of this trend is the software application called Peak created by Metalab. In the words of the application's public website, "Peak is the automated way to keep track of what everyone is working on" (Usepeak.com). It does so by monitoring employee activity on various online tools such as Gmail, Google Drive, GitHub, Dropbox, and Basecamp. Marshall Haas, director of Peak, explains the deeper intentions of the project:

> The idea isn't to encourage micromanagement, it's to encourage passive management. We want to enable managers to simply take a look at Peak to see

> what someone is up to on a given day, or what they accomplished yesterday, and only intervene as needed...The same benefits are there for colleagues working together. At MetaLab all of our employees can see what everyone else is up to via Peak. (Pavlus)

Because Peak and many tools like it benefit from workflows that are predominantly facilitated by digital devices, it would seem tasks that remain largely or entirely in the analogue realm—such as a confidential, face-to-face meeting between two or more people—would be impossible to surveil and process at scale. These types of interactions have little-to-no inherent "data exhaust".

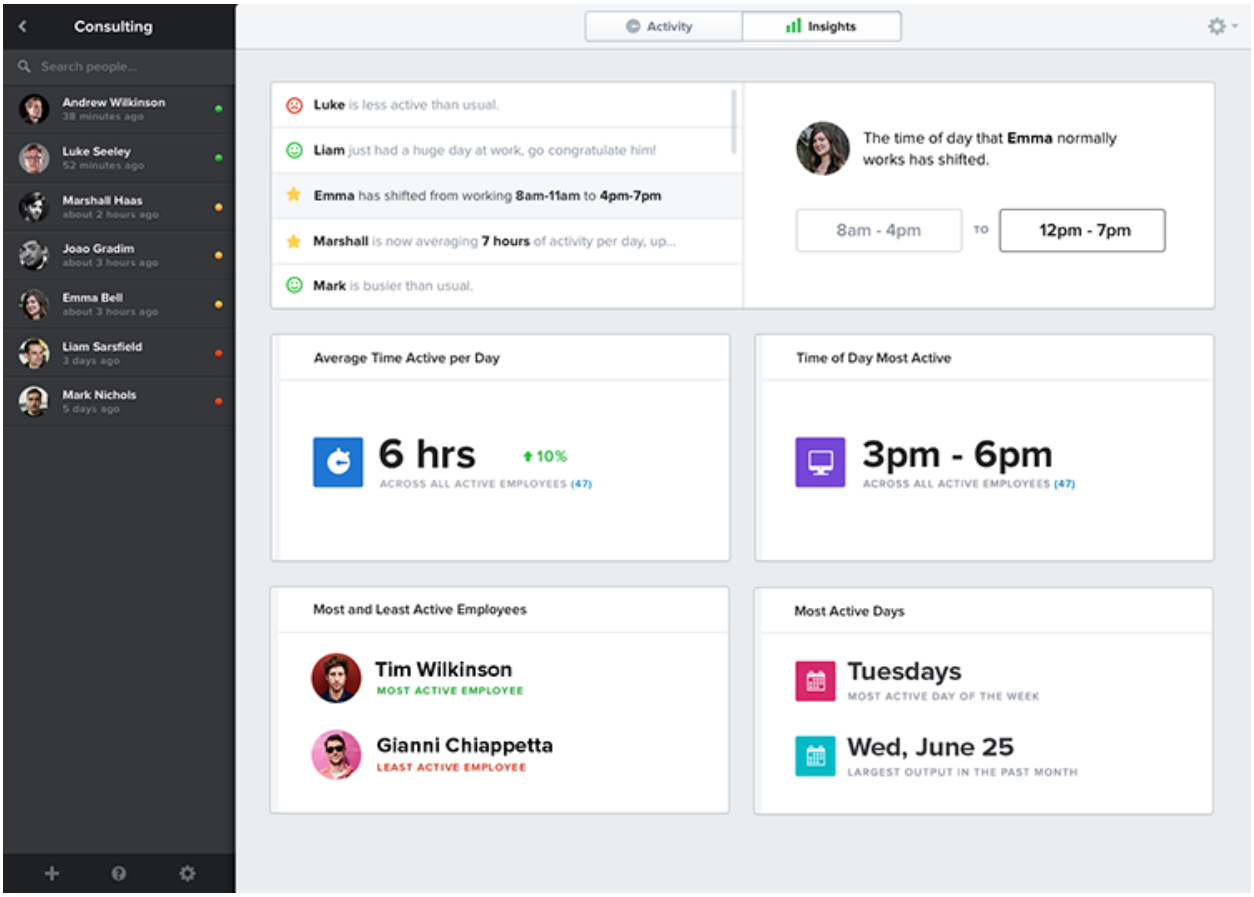

Figure 1.1: *Peak* by MetaLab

Tricky as these non-digital interactions might be to capture by a digital system, it is by no means impossible. Microcontrollers and sensors are inexpensive and are increasingly embedded

in our architecture, tools, transportation, clothing, and just about everything else. The workplace and even the employee are beginning to be outfitted with sensors and processors.

A nascent business called Sociometric Solutions is an excellent example of a commercial foray into devices for workplace surveillance and analytics. The company is the result of an ambitious MIT research project that developed a sensor-packed badge that employees wear throughout the workday that ambiently gathers data about the employees' behavior. This includes metrics as diverse as physical behavior (such as sitting, standing, and walking), features of speech (such as interest, excitement, and influence over others), exact location within a building or room, group conversations, and face-to-face conversations (Waber 5). These metrics can be overlapped and compared to generate more complex metrics that lead to valuable insights that are of great importance to large companies.

For example, when Bank of America hired Sociometric Solutions, it wanted to figure out why some of its call centers performed better than others. Sociometric Solutions' data showed that the better-performing centers had employees who had strong, interconnected networks at work, so the company tested out a new break structure that would enable more employees to take breaks at the same time, thus encouraging more social interaction and the formation of close-knit groups. The result was a 75% reduction in the call centers' burn rate and a 23% reduction in call time, worth conservatively $15 million a year to Bank of America, according to Benjamin Waber, president and CEO of Sociometric Solutions. ("Why You're Boss Cares if You're Happy")

These types of returns bode well not just for the future of Waber's company and others like it, but they also signal an inevitable trend toward workplace monitoring and analytics with increasingly levels of fidelity.

Risk & Reward

The benefits of applying big data practices to the workplace are perhaps most immediately obvious to those who are in charge of managing large businesses. As can be seen in the aforementioned, high-ROI example regarding Bank of America's call centers, there are organizational efficiencies that can be gained with workplace monitoring that have financial clear, financial returns. It also introduces a degree of unprecedented fidelity to the data on which workforce optimization decisions are made, resulting in more of these decisions being made more quickly and with greater confidence.

Much of the recent crop of workplace monitoring services and applications are focused on employee satisfaction. The working assumption seems to generally be that a happy workforce is a loyal and productive workforce. Sociometric Solutions likes to point to case studies that result in changes that are positive from both the employees' perspectives as well as management's. The heroic studies are those resulting in more breaks during the workday or process improvements that eliminate unnecessary and tedious tasks all while pointing at a dollar amount that is saved for the organization.

However, there is a capacity for both ill will and unintended, negative consequences in these systems. Given a climate of poor leadership, handing over tremendous amounts of personal data about employees to management could have disastrous results for all parties. This is particularly true if these surveillance programs offer little-to-no oversight from employees or—worse yet—are deployed unbeknownst to employees.

Potential abuses and negligent uses of such systems abound. These include decisions from management that have ill intentions such as the termination of employees based on non-work-related data, the coercion of employees due to insufficient safe harbors from surveillance, and the packaging and selling of personal data as a corporate asset. Other potential abuses may

be unintentional but are no less damaging. Employees can potentially be libeled due to false positives recorded by the system regarding their behavior, and this would have costly, legal ramifications for the employer. Due to the complexity of these systems and the tricky task of quantifying human behavior, they have the potential to create a frustrating, Kafka-esque work environment in which the standards by which employees are measured are governed by algorithms that are incomprehensible to the workforce. To put it simply, the baseline infraction is the invasion of privacy, and with such high fidelity surveillance system, this baseline infraction is an easy mistake to make.

As will be discussed in the following section, the law remains murky at best when it comes to the privacy rights of employees. This being the case, it is the employee that will likely take the fall when a workplace surveillance program is abused or neglected.

Chapter II: Power, Privilege, & Privacy in the US Workplace

The increase of the monitoring technologies and personal data processing in the workplace parallels the increase in concern US citizens are experiencing toward big data and privacy in general. In light of the Edward Snowden leaks of 2013 that continue to reveal invasive surveillance practices of the US government, this concern amongst US citizens has seen a dramatic increase in the past twelve months. Implicated in the Snowden leaks are many large tech companies—such as Google—that provide services to millions of US citizens. This implication is causing many people to distrust not only government organizations but also all organizations that handle or request personal data.

This concern naturally extends towards the organizations for which people work. And, it is probably safe to assume the more employers utilize surveillance technologies and personal data processing practices, the more employees will become concerned about their privacy.

US Privacy Legislation for the Workplace

Employers in the US have operated largely free of legal restraints or directives when it comes to the capturing and processing of personal data of their employees. There are a few exceptions—the biggest being Health Insurance Portability and Accountability Act (HIPAA)—but these exceptions are concerned with only certain types of personal data. There is no broad legislation that provides baseline protection for the privacy of all manner of personal data of employees.

Some have pointed to this issue as being a result of the US having no legislation that explicitly establishes privacy as a human right (Lasprogata par. 8). Without such a precedent, there is a lack of legislation—such as privacy rights for employees—that would naturally flow from this. This has also made it difficult for employees to take legal actions against employers on matters of personal data and privacy in the workplace. Any success that individual employees have seen in such battles has been the result of legislation passed at the level of state government—such as Connecticut's Personnel Files Act. However, only a handful of states have enacted such legislation.

Because the European Union has directives that explicitly elevate privacy to the status of a fundamental right, there is already a legacy in many EU member countries of legislation that directs how employers are to handle and process personal data of employees (Lasprogata par. 9). This legacy of data privacy is decades old with many international documents being released in the 1970s and 1980s which were the direct result of the growth stages of the computer industry "which introduced a technological dimension to the right of privacy" (Lasprogata par. 12). The US has instead taken a "reactive stance to the technology revolution" and seems to generally believe there is already enough legal precedence in place to address any upcoming privacy

concerns.

Rugged Individualism & At-Will Employment

As can be clearly seen in the US population's overwhelmingly negative response to the recent revelation of mass, unwarranted surveillance practices executed by the US government, privacy is very important to the US. This has always been true. However, instead of this importance being encoded in US legislation, it is implied in cultural principles such as the ideal of the rugged individual who is capable of handling his or her affairs without any government intercession. Privacy can be seen as the default state of this ideal. The individual can choose to share certain facets of her or his self or secure desired protections and benefits via contracts and covenants he or she forges with other parties.

This cultural principle is perhaps at its most explicit in the legacy of at-will employment. The online legal dictionary Law.com defines at-will employment:

> A provision found in many employment contracts which suggest the employee works at the will of the employer, and which the employers insert in order to avoid claims of termination in breach of contract, breach of the covenant of good faith and fair dealing, or discrimination. Inclusion of such a term puts the burden on the discharged employee to show that he or she had reasons to believe the employment was permanent. The employer uses the "at-will" provision to claim: We could fire the employee at any time, no matter what the reasons.

This definition makes clear the importance of both individuals being capable negotiators with equal bargaining power. This definition also not-so-subtly hints at the controversial nature of at-will employment. At the heart of this controversy is the carte blanche ability of the employer to terminate an employee without just cause. Theoretically, an employee can bargain

certain protections and establish a granular agreement with an employer that would prevent the employer from recklessly terminating said employee.

At-will supporters would point at this broad, legally unencumbered, clean slate for negotiating terms of an employment as an example of its power for both the individual and the employer, resulting in employment agreements that can fit the unique needs of both parties. Some supporters point to the success of Silicon Valley and its highly agile, highly meritocratic, entrepreneur-friendly environment as an example of the power of at-will employment. This is a particularly controversial notion considering Silicon Valley is "rife with discrimination and one of the most unequal labor markets in the country" (Hyde 1).

In summary, the rights of employees is not an area that has much government intervention—specifically when it comes to how contracts might be negotiated or how personal data is to be handled. This is certainly concerning for many and is a matter that requires attention. However, there are individuals that see this as fertile ground for worthwhile research and innovation of applications that stand to benefit all parties. This viewpoint would caution against brash, substantial government intervention for fear of clamping down nascent fields of study and industry.

> Because a single dramatic incident involving a breach of privacy could produce rules and statutes that stifle the nascent field of computational social science, a self-regulatory regime of procedures, technologies, and rules is needed that reduces this risk but preserves research potential...Researchers themselves must develop technologies that protect privacy while preserving data essential for research. These systems, in turn, may prove useful for industry in managing customer privacy and data security. (Lazer 722)

Thus, there might be some merit to our current legal murkiness. If not merit, it is at least

an opportunity for innovation. The goal, as made clear in the above quote is to responsibly take advantage of the United States' distinct situation regarding privacy to both show the power of data-rich information products and computational social science as it benefits both organizations as well as individuals. However, the key is in a responsible, ethical approach that upholds the dignity of and therefore gains the trust of employees. A failure to introduce responsible, employee-centered programs, policies, and user interfaces for the surveilled workplace of the future can result in retaliation and legal precedence that delays—or thwarts—applications that might benefit all parties.

Chapter III: The Role of Interaction Design in Addressing US Workplace Privacy

User interfaces and the maturing user-centered design processes commonly executed to create them stand to play a vital role in achieving this goal of balancing the benefits of big data for the organization against the benefits and privacy of the individual employee. This is particularly true if the goal is to establish mutually beneficial practices without requiring substantial government regulation. User-centered design's pre-supposition that a good design is what makes sense to, protects, and delights the end user ensures a high level of concern for an individual's need for privacy and ability to comprehend, navigate, and even create binding policy documentation for the workplace. There are three basic strengths of digital user interfaces backed by competent interaction design that can help establish mutually beneficial practices in this context: the ability to translate abstract concepts into concrete implications, parse complex systems into easily understood experiences, and allow for highly individualized customization of terms and agreements at scale. In the following pages, these strengths will be further explored in both positive and negative examples as they pertain to policy terms, negotiation, and building trust.

Making the Abstract Concrete

John Foreman, Chief Data Scientist at MailChimp and author, has wittily commented on the basic problem of private data as currency:

> [H]umans are bad at discerning the value of their data. Personal data just appears out of nowhere, exhaust out of life's tailpipe, so why not trade it for something small? I'm personally willing to hand over my own GPS location full time just so I have access to Angry Birds and a smartphone flashlight app. Our brains evolved to assess trade-offs best in the face of immediate, physical needs and threats. Should I run from that predator? Absolutely. Unfortunately, we still have these same brains. That's why the camel crickets in my crawl space make me flip my shit, but giving my kids' data to Disney World feels perfectly acceptable.

Interactivity, as it is facilitated by digital systems, have the capability to take in user input and quickly respond with feedback regarding said input. This is perhaps the most basic notion of computation, human-computer interaction, and interaction design. This computation can easily model potential outcomes for a user's decisions. Thus, user interfaces that are to help users manage their privacy and personal data can provide a boon by modeling outcomes regarding these decisions.

Perhaps one of the simplest but most heroic examples of this behavior in the world of consumer software is that of the real-time refund calculator in Intuit's tax management software TurboTax. As the user works their way through the guided tax form logging different decisions and inputs, this ever-present widget updates to reflect the most accurate estimation of the user's tax return. This type of modeling is common in financial and budgeting tools at the consumer level. This is likely on account of computational modeling requiring quantified data and inputs

and the inherent quantified nature of finance. When stepping outside of the world of finance and budgeting, it becomes more difficult to find examples of information technology that models the outcomes of choices.

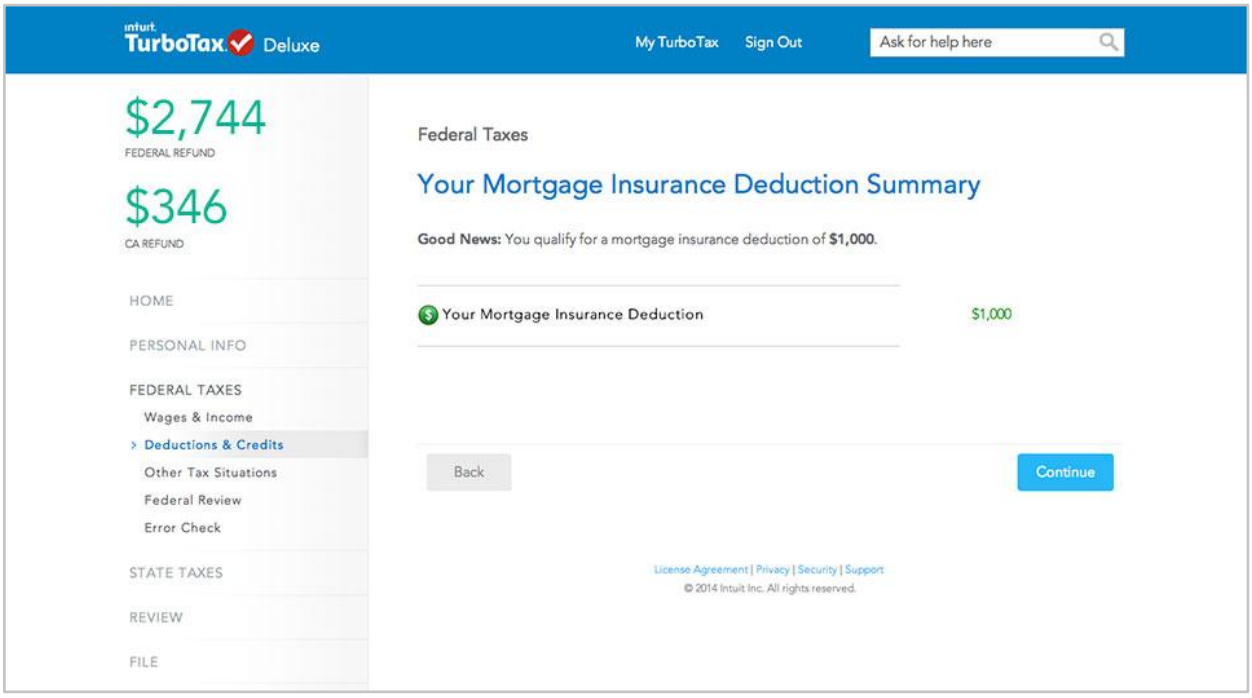

Figure 3.1: *TurboTax* by Intuit

However, one standout example would be that of the Made in a Free World's *Slavery Footprint* website. The survey asks of the participant various personal attributes (such as age, gender, and location) as well as personal choices and preferences (such as diet, hygiene, recreational activities). This results in a report that informs the participant how many slave workers are employed to support the lifestyle identified via the survey responses.

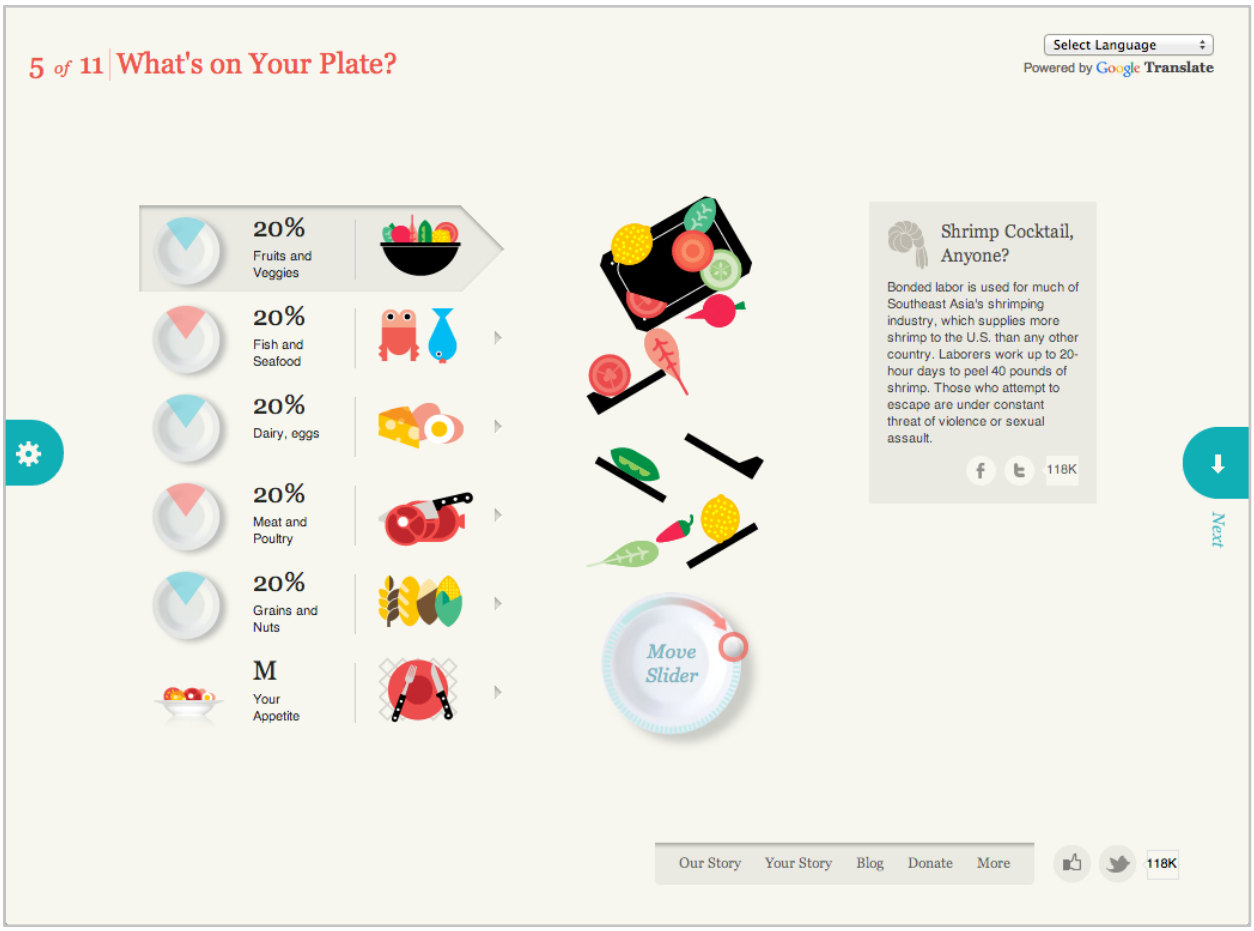

Figure 3.2: *Slavery Footprint* by Made In A Free World

These user interfaces are able to bring to bare information that would otherwise be impossible to gather without substantial cost—of time, money, or both. This information intends to influence the decision of the user. Because this feedback is influential, it is critical that it is clear, correct, and surfaces any biases.

Mitigating & Managing Complexity

Where pen and paper, face-to-face discussion, and handshakes among individuals and small parties have been the primary, historical means of negotiating contracts, it has become more commonplace for lawyers—often teams of them—to be the intermediaries or authors of binding agreements. At large scale, these agreements can involve a tremendous amount of legal

complexity. This often manifests in documents that are incomprehensible to most people. They are designed to protect interests more than inform. In the context of the workplace, this complexity puts in place an impenetrable barrier between individual employees and the opportunity to realistically bargain or negotiate policies or benefits. It is not uncommon for unions to hire legal advisors to parse the complexity of issues facing its members and, in turn, bargain on their behalf.

There are plenty of negative examples or "dark patterns" of this. One needn't look any further than the agreement's they have signed with their employer, email provider, or social media platform to find horrendous user experiences. Perhaps the most infamous example is that of the iTunes terms of service which—when printed out—is over 50 pages and is to be read and agreed to not just upon installation but also upon the majority of updates made to the software. More than just a usability problem, some have even pointed to this issue as the dawn of a new culture of non-informed consent that is bound to cause issues when it comes to culpability in lawsuits (Bechmann). In other words, throwing reams of legalese at users as a means of avoiding litigation is potentially not as bulletproof as it once was.

There are a few examples of services that are making inroads regarding the usability of legal agreements. MailChimp, an online service that allows its users to compose, send, and track email newsletters, uses a cleanly formatted website with thoughtful information architecture and a few interactive elements to better communicate their terms of use and privacy policy.

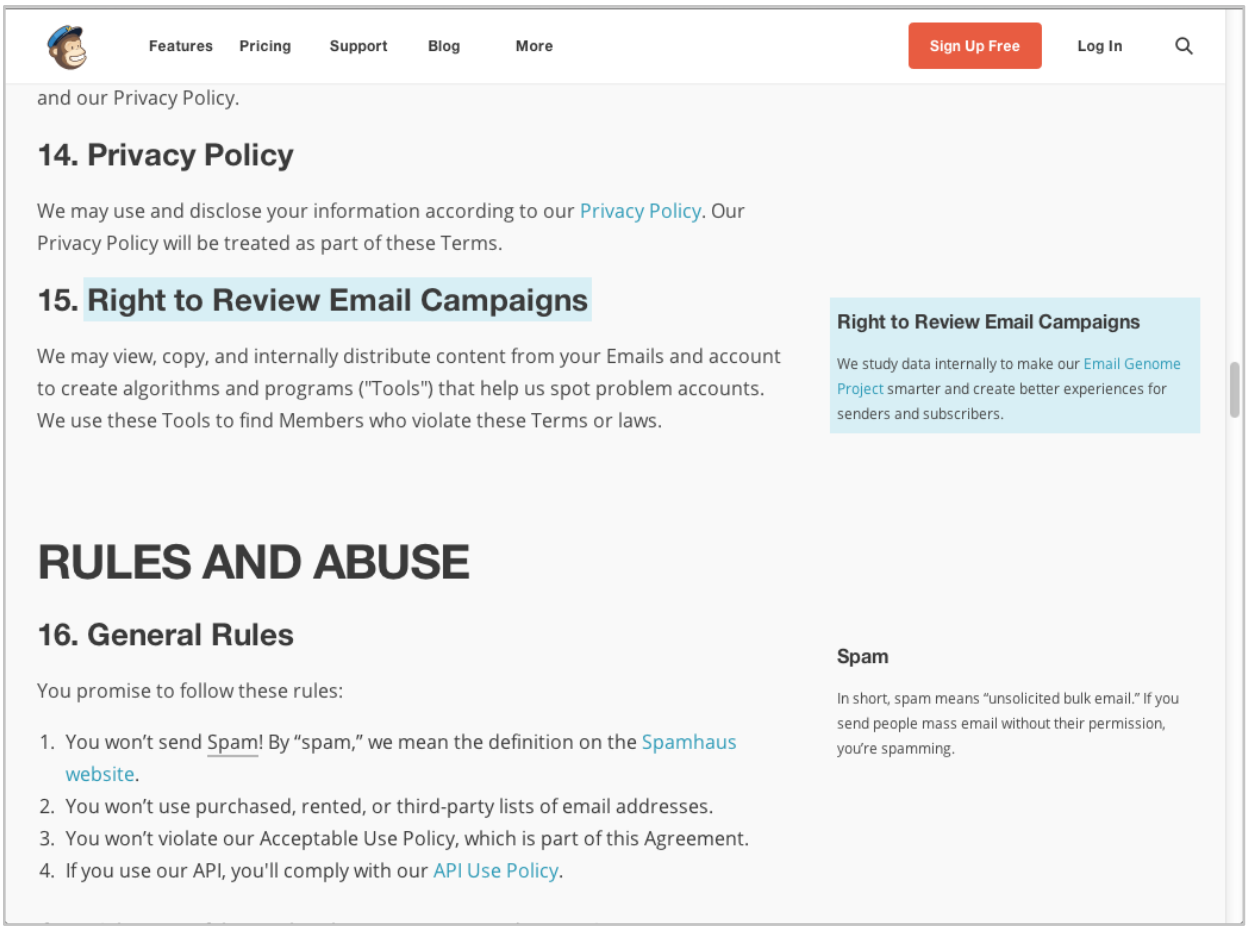

Figure 3.3: *Terms of Use* by MailChimp

Similarly, CodePen—an online WYSIWYG code editor—has added a "plain English" layer to their Terms of Service page. The legalese of the Terms of Service is parsed into sections with each section including easy-to-understand text unpacking the complex, binding legal text.

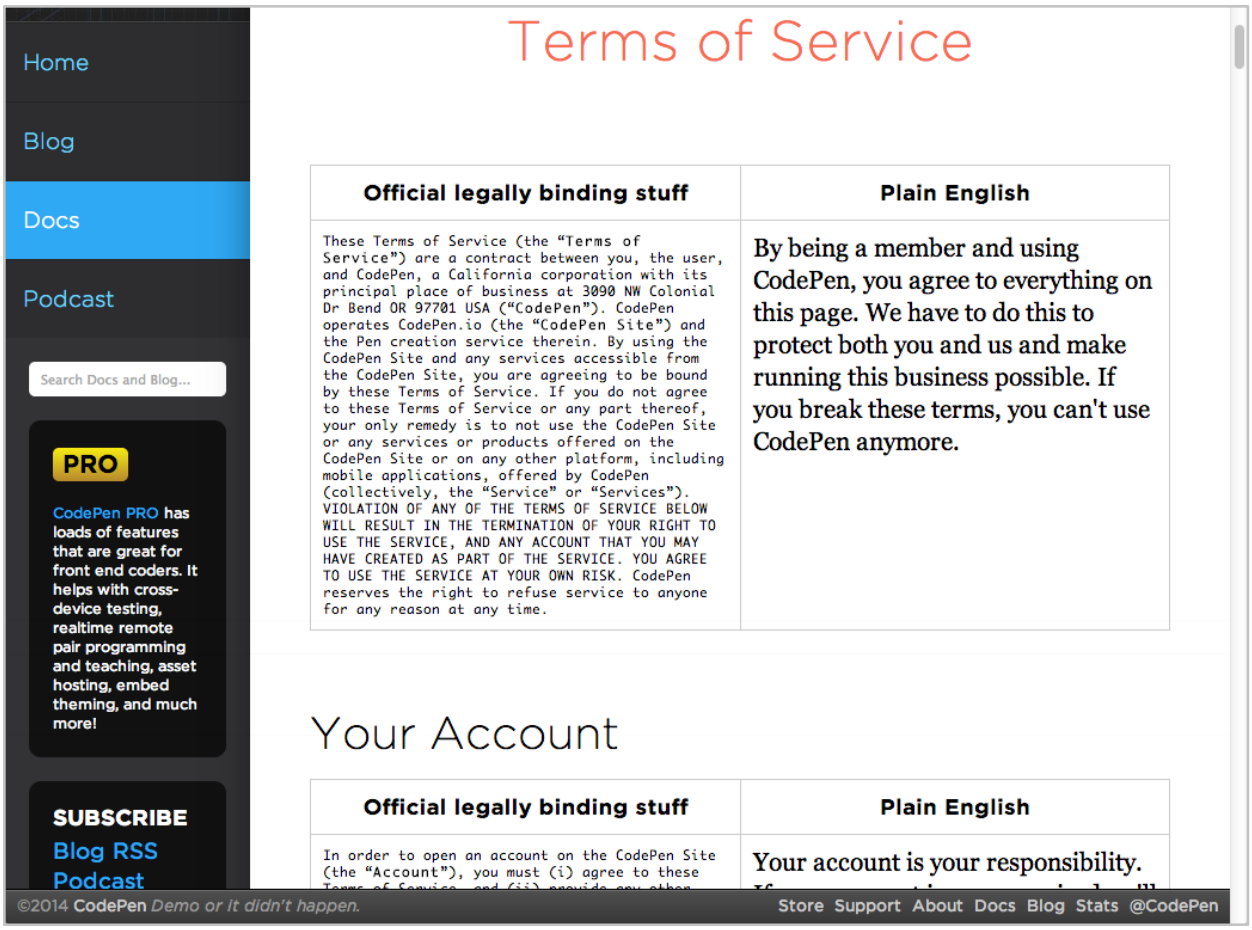

Figure 3.4: *Terms of Service* by CodePen

Customization of Terms

Where information technology has allowed for levels of individual customization at unprecedented scale, there is a suspicious lag in this type of customization when it comes to the terms of service documents, privacy policies, and other software-facilitated agreements. Not only are users confronted with pages upon pages of legal language when presented with a new software application or a job application, this document is read-only. So, even if they were capable of comprehending it, entering into negotiation regarding the terms is not an obvious option—if an option at all.

What is perhaps the most widespread and accessible example of this dark pattern has to

do with the request for (although "statement of" might be more appropriate) personal data or hardware sensor access on behalf of a mobile application. At this point, the user has only a binary choice: allow access to everything requested or deny all access. The latter choice often results in software that is dysfunctional or completely inoperable such that the user just as well uninstall the application. Commonly there isn't even a choice: the user can allow all requested access or just not install the application. One of the more notable examples of this dark pattern is that of Brightest Flashlight Free, a flashlight app for the Android phones by GoldenShores Technologies boasting almost a million 5-star ratings, which gathers GPS and other device information that is nonessential to the application's stated functionality for the purpose of selling the user data to third parties (Steinberg).

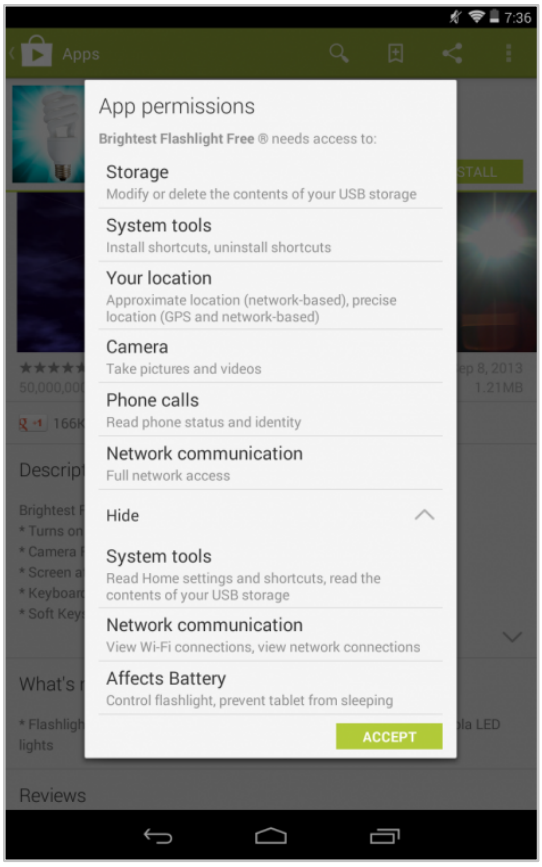

Figure 3.5: Brightest Flashlight Free's App Permissions

As mentioned before, this is currently the going rate. Finding a service that allows for any

kind of recourse or negotiation of its terms of service is nearly impossible. However, it is entirely possible for user interfaces to easily afford this type of negotiation and customization. OkCupid provides a good example of a user experience that gathers data from the user via questions about themselves but always allows the user to answer privately—which means their response will not be shared with other users. It results in a respectful but engaging conversation between the user and the UI. Considering the questions being asked are very personal in nature, this type of trust building between user and UI is critical OkCupid to be successful. This would also be the tenor of UI "conversation" needed for workplace surveillance software to be successful.

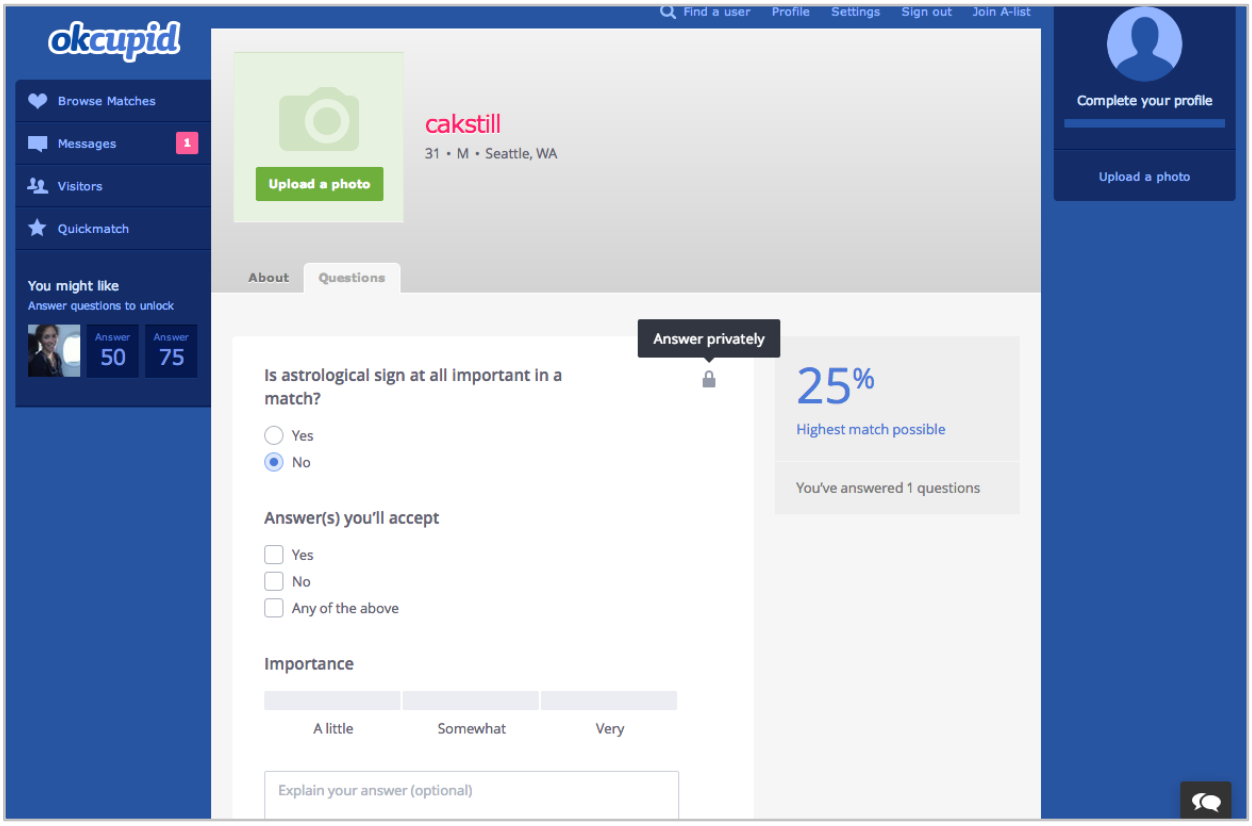

Figure 3.6: *Questions* by OkCupid

Chapter IV: Research

The research phase of my work encapsulates all the initial work executed to form an understanding of surveillance and privacy in the workplace. Activities for this phase included

bibliographic research as well as some primary research in the form of employee interviews. The primary outputs of the discover phase were a set of design principles, user stories, and scenarios. These outputs provided the bedrock for the design of the Alpha Prototype, and, in turn, the design and testing of Alpha Prototype informed and refined the design principles.

Employee Interviews

As a user-centered designer, it was my instinct to begin speaking with potential users as soon as possible. While this afforded some specific discoveries about specific contexts and workplaces, perhaps the biggest insight I came across was how integral the relationship an employee has with their direct manager(s) is when it comes to the deployment of potentially invasive programs or initiatives. Second to this was the opinion an employee holds toward management at large and how they feel the workforce is generally treated. Most employees I spoke with had little concern about the deployment of an internal initiative involving surveillance.

Interviewees generally disliked or did not really understand the notion of deploying surveillance for the purpose of workforce accountability. For some, the dislike was the on account of the distrust they felt it communicated. For others, it wasn't so much a dislike as it was an inability to see why their employer would have a need or desire to use anything beyond current practices to ensure accountability.

An insight gained from interviews was that employees—despite voicing a lot of trust toward their employer—still felt more comfortable with the thought of a third party processing personal data and handling much of the operations of a workplace analytics initiative involving potentially invasive and unprecedented means of surveillance.

Bibliographic Research

Bibliographic research was absolutely integral to understanding the trends and legal landscape of workplace surveillance, workforce analytics, and privacy in general. The fruits of this research can be seen throughout the written component, the design principles, and ultimately the design of the prototype.

Chapter V: Design Principles

Luke Wroblewski succinctly defines the purpose of design principles:

> "Design principles are the guiding light for any software application. They define and communicate the key characteristics of the product to a wide variety of stakeholders including clients, colleagues, and team members. Design principles articulate the fundamental goals that all decisions can be measured against and thereby keep the pieces of a project moving toward an integrated whole." (Wroblewski, "Developing Design Principles")

Potential design principles were extracted directly and indirectly from research efforts. This was primarily the case with my bibliographic research. As more and more bibliographic research occurred, the list of design principles would expand with new content and contract with synthesis and consolidation of concepts. What follows is an inventory of the finalized design principles accompanied by a deeper description of the principle and the source or sources from which it originated.

Principle 1: Personal Data is an Inalienable Representation—not a Currency

In the past decade, many services predicated on the idea that a user's data can be exchanged as payment for said service have seen tremendous success and adoption. Businesses

that have deployed such service models include tech giants such as Google and Facebook. However, there has always been a consistent nagging from those concerned with the implications of such service models. And, in light of the Edward Snowden leaks regarding government surveillance as well as huge tech companies making increasing plays to provide the essential infrastructure for societies, this concern has become widespread and is fueling much debate and dialogue. In spite of its effectiveness in user adoption and even some legitimacy as a system that could possibly uphold the privacy of individuals, treating a user's private data as a commodity that has transferable ownership is gaining a poor reputation.

To counteract this model of personal data processing, the thesis prototype is to be designed with a principle that shares the same spirit of the EU directives that regard human dignity and privacy as a fundamental right. In this vein, the design is to leverage any opportunities to communicate this belief—that their data is theirs—to the user to better establish trust between all parties.

Principle 2: Personal Data is a Democratic Mechanism

In writing about the delicate tension between privacy and transparency in society, Evgeny Morozov points out that the right to complete privacy—to withdraw oneself wholly from the public sphere, disconnected from corresponding responsibilities—poses a danger for society and begins to "undermine the very democratic regime that made the right possible" (Morozov, "The Real Privacy Problem"). Be it a society or an organization, there is a need for some degree of transparency at the level of the individual in order for peers to mutually benefit from knowledge sharing as well as for government officials or management to make informed strategies for the organization. Morozov ultimately points to the importance of politics—the realm of dialogue and negotiation given the messy, human, often confusing nature of societies and organizations—as

the medium in which personal information should be pledged or withheld.

Thus, employees should view their personal information not merely as being useful only to themselves and their own career but also as something that can be pledged toward strategies and initiatives with which they deem beneficial. Furthermore, as opposed to a UI designed with transactional metaphors, the UI of workplace surveillance software should instead seek out dialectical patterns and metaphors that are appropriate for negotiation, political discourse, and the formation and maintenance of relationships.

Principle 3: Opt-In is the System Default

Dark Patterns, a website that collects examples of ethically dubious user experience design patterns, defines the dark pattern called ‘misdirection’ as follows: “[t]he attention of the user is focused on one thing in order to distract its attention from another”. This pattern is commonly applied to software installation wizards that are trying to stealthily install additional, generally unwanted software. This is often accomplished by opting the user in by default in hopes that they fail to opt out. (“Misdirection")

Users are becoming increasingly aware of this pattern and others that are used to opt in their personal information. A 2012 study showed that over half of app users have decided not to install an app when they discovered how much personal information they would be required to share in order to use it. The same study also showed that 30% of app users have uninstalled an app already on their phone upon learning it was collecting personal information that they did not wish to share. (Boyles)

Such interactions instill a lack of trust from the user towards the software and the creators thereof. These tactics that attempt to sneakily opt people into generally undesirable circumstances, or—worse yet—a lack of any interactions that allow the user to opt out can even

be viewed as coercive. Coercive maneuvers made by management to surveil the workforce can actually lead to paradoxical results. “These efforts become an escalating battle of wits in which managers devise ever more sophisticated surveillance and employees use their ingenuity to circumvent it” (Sewell 939).

This means that such systems—when it comes to the processing, synthesizing, and reporting of data—should be engineered and designed under the assumption that a complete data “portrait” of the workforce—even at the level of the individual—is unlikely. Besides, this notion of the inability of embedded, data-gathering system to not paint a complete picture is not just a result of honoring active consent of those being surveilled but is a deeper, inherent reality. A complete, qualitative picture of human behavior being produced by a system is an impossibility (Greenfield 133).

Principle 4: Some People Care about Details—Most Don't

While it is critical for the sake of communicating trustworthiness to extend the offer for line-item consent to potential participants of a surveillance system, many users are not interested in the finer details of their consent and participation. When doing initial research interviews, it became clear that employees that trusted their employer did not feel a lot of need to control every aspect of their participation in a workforce analytics study that would involve surveillance. Therefore, software should allow an easy path for users that wish to consent quickly and completely.

This principle also has another application. As mentioned in a previous section, there is a tremendous usability issue when it comes to the lengthy, complex, legal documents that spell out the terms of agreement for software applications or other agreements. While these documents will remain necessary for legal purposes, the user experience design of workplace surveillance

software should find ways to interpret the terms in a user-friendly manner.

Principle 5: Transparency is an Effective Means to Trustworthiness

When doing the initial round of interviews with people that work for employers or in fields that might deploy surveillance technology for workplace analytics, one interviewee mentioned that it was really a matter of surfacing what her company wanted to do with the data gathered by such an initiative. When running some hypothetical uses by her, she claimed to have no concerns with any of them and would volunteer her data. This was true of hypothetical uses that had no benefit for her. After further discussion, she realized and communicated that it was the good faith of clearly exposing intent that helped her trust the initiative just as much if not more than fully understanding the intent.

This was echoed when facilitating the usability tests on the prototype. If the business' intentions regarding the workplace surveillance were not stated immediately and clearly, a few participants mentioned this made them concerned. While it is important to let users know what is intended with workplace surveillance so they have an opportunity to judge if it is worthy or not, it seems there is a much deeper trustworthiness that is gained by being upfront with intentions.

Principle 6: Effective Policies are the Product of Recourse and Negotiation

Adam Greenfield articulates the problem this design principle sets out to mitigate:

> [T]he deep structural design of informatic systems—their architecture—has important implications for the degree of freedom people are allowed in using those systems, forever after. Whether consciously or not, values are encoded into a technology, in preference to others that might have been, and then enacted whenever the technology is employed. Such decisions are essentially

> incontestable...Even if we are eventually able to challenge the terms of the situation—whether by appealing to a human attendant who happens to be standing by, hacking into the system ourselves, complaining to the ACLU, or mounting a class-action lawsuit—the burden of time and energy invested in such activism falls squarely on our own shoulders. (Greenfield 144, 146)

Systems that embody and become a platform of institutional power structures—such as a system concerned with measuring and communicating how people behave at work—are highly susceptible to the issue Greenfield is raising. Therefore, it was of primary importance to always be identifying opportunities for the UI of my prototype to afford users the ability to react against any unintended biases inherent to or acquired by a system that tracks personnel.

Principle 7: Get Out of the Way of Work

This is a simple, obvious principle. Any such system should minimize its interruption of an employee's workday. This concern was mentioned frequently when testing the prototype. The concern regarding privacy of such systems is rivaled by the concern of it being a nuisance to getting work done.

Principle 8: A Third Party Embodies and Communicates Bipartisanship

This principle started out as very much a hypothesis at the beginning of the project. On the one hand, a third party handling the deployment and data processing of a workplace surveillance program could put employees at ease, knowing that their managers or peers would not be the ones viewing and synthesizing their information. This could result in chasms in the power structure within the organization. On the other hand, a third party could also represent an outside organization that is not necessarily beholden to the organization and its members and

could seek out its own benefit when wielding employee information.

However, most usability test participants preferred the notion of a third party handling and processing the data. It represented neutrality. Thus, it would seem that a third party does indeed help establish trust between employees and the system.

Chapter VI: Draft Prototype Design

While primary and secondary research continued throughout the entire project, it naturally tapered off. At this point, it was time to begin work on the initial prototype. The first step in doing so was making discrete the user needs and functionality of the system and stringing those together into scenarios.

Scenarios

User stories were generated first. These user stories were intended to cover as many of the use cases as possible that a workplace analytics system might host. User stories were executed from the perspective of employees, managers, and admins. The list grew very long very quickly. It became clear that the thesis study would only be able to dive into a small subset of user stories. This being the case, user stories from the perspective of employees were prioritized and translated into scenarios.

Ultimately, five scenarios were developed that covered as many of the user stories and concerns pertinent to the thesis. The scenarios were also developed such that they followed a basic narrative of what it might be like to experience a workplace surveillance study as an employee from start to finish.

Figure 6.1: Scenarios List

The first draft of design principles, user stories, scenarios, and UI sketches were based on the initial discovery research and interviews. I then needed to move quickly from these low fidelity design artifacts into an initial, interactive prototype, because the most critical milestone in the design phase was the user testing of said prototype. The first step was to generate wireframes as a means of mapping out the draft prototype.

In doing research, initial sketches, and drafting the user stories and scenarios, it became apparent that the user experience of this software would most likely be deployed primarily via a website and mobile application. It is entirely possible the software could also be deployed as a desktop application as well. If this was the case, I see there being very few differences between what the basic user experience design for the desktop website and that which is designed for a desktop application. Many deeper, technical considerations would need to be made to put a finer point on platform decisions. These would rely heavily on presently incalculable contexts such as the business model of the party deploying this service, the workplace types they would like to target, and so on. All of these considerations extend beyond the scope of this project.

Similarly, I also quickly determined that finite stretches of surveillance—instead of

always on surveillance—would help reinforce several of the design principles I had already established. Particularly, it stands to dramatically strengthen the principle of transparency in that it is much easier to expose the intention of a burst of surveillance. Open-ended surveillance becomes much more difficult to explain specific purpose month-to-month, year-to-year. Because I went with the assumption of finite stretches of surveillance with a specific purpose, the user experience frequently refers to this unit of time as a "study".

Draft Prototype

For this aspect of the design (and much of the final prototype), I worked primarily in Axure. This allowed me to initially design layout and information architecture with static wireframes and quickly transition into prototyping interactivity all within the same program. What follows are states from the draft prototype with commentary.

Study Overview

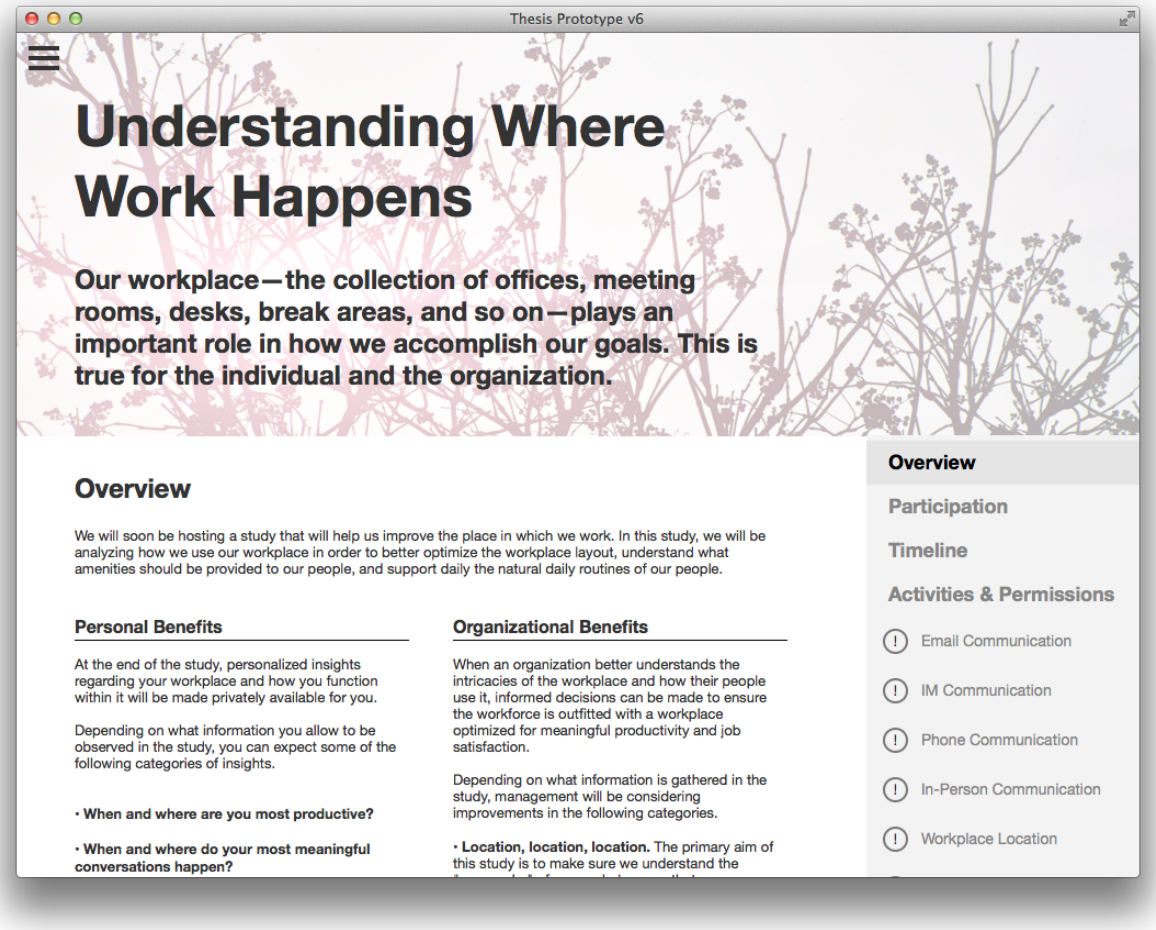

Figure 6.2: Study Overview, Intro (Draft Prototype)

The study overview provides the user with a summary of what the study is about, why they are invited, the general schedule of the study, the activities of interest in the study with the ability to select which activities they will allow to be surveilled. The study overview also acts as the invitation page. This means the study overview is likely the first impression a user will have of the system. The study overview is the prominent page of the first and second scenarios and holds much of the content and many of the interactions that are critical for testing the hypothesis of the thesis.

Because this page holds so much content, it is a very long page. This caused me to look

into affordances and feedback that would allow the user to always understand where they were in the page and allowed them to quickly jump to other sections of the page. The result was what I refer to as the anchor link panel the spans the height of the browser viewport on the right side.

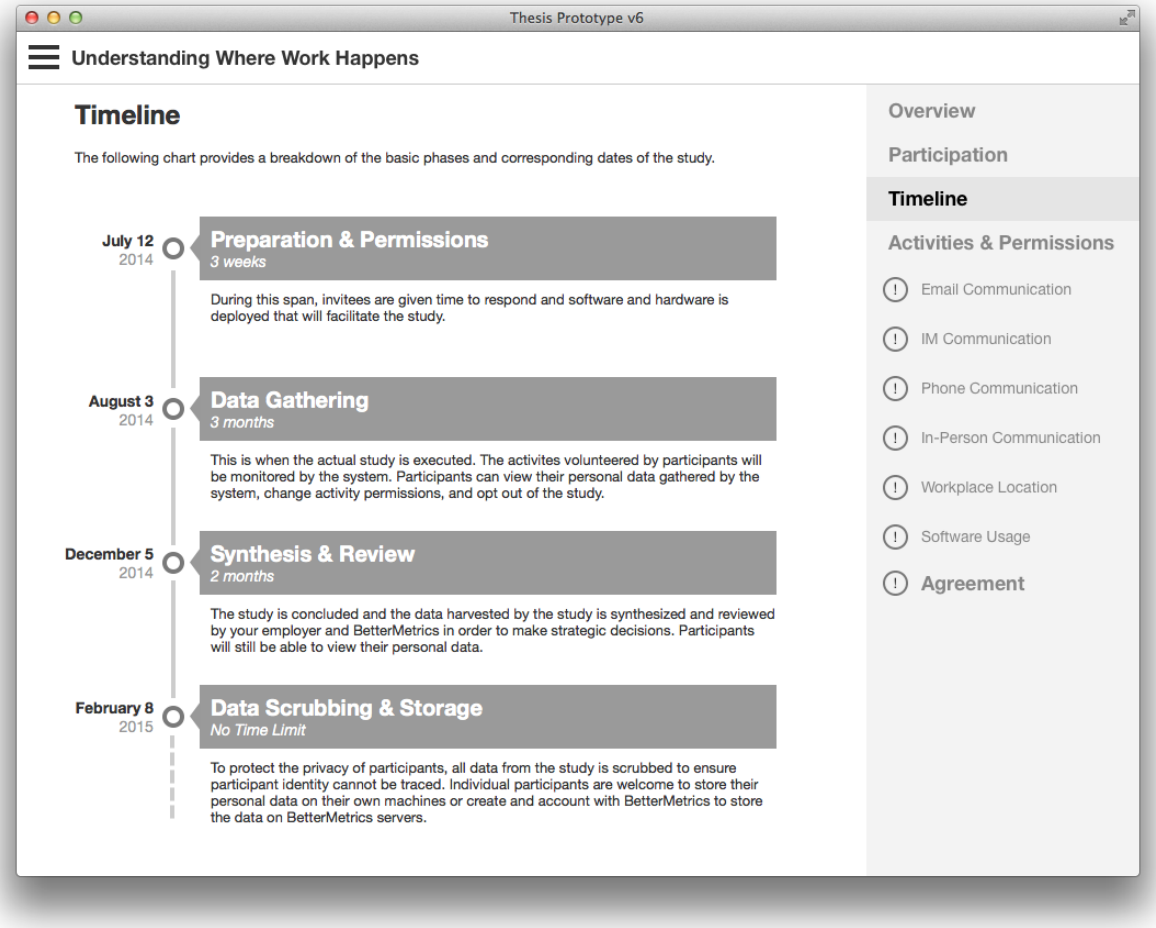

Figure 6:3: Study Overview, Study Timeline (Draft Prototype)

The Timeline section intends to inform the user about the temporal scope of the study and what is to be expected in each phase. It had a secondary purpose of helping build trust by informing the user that their data will be destroyed in the final phase of the study.

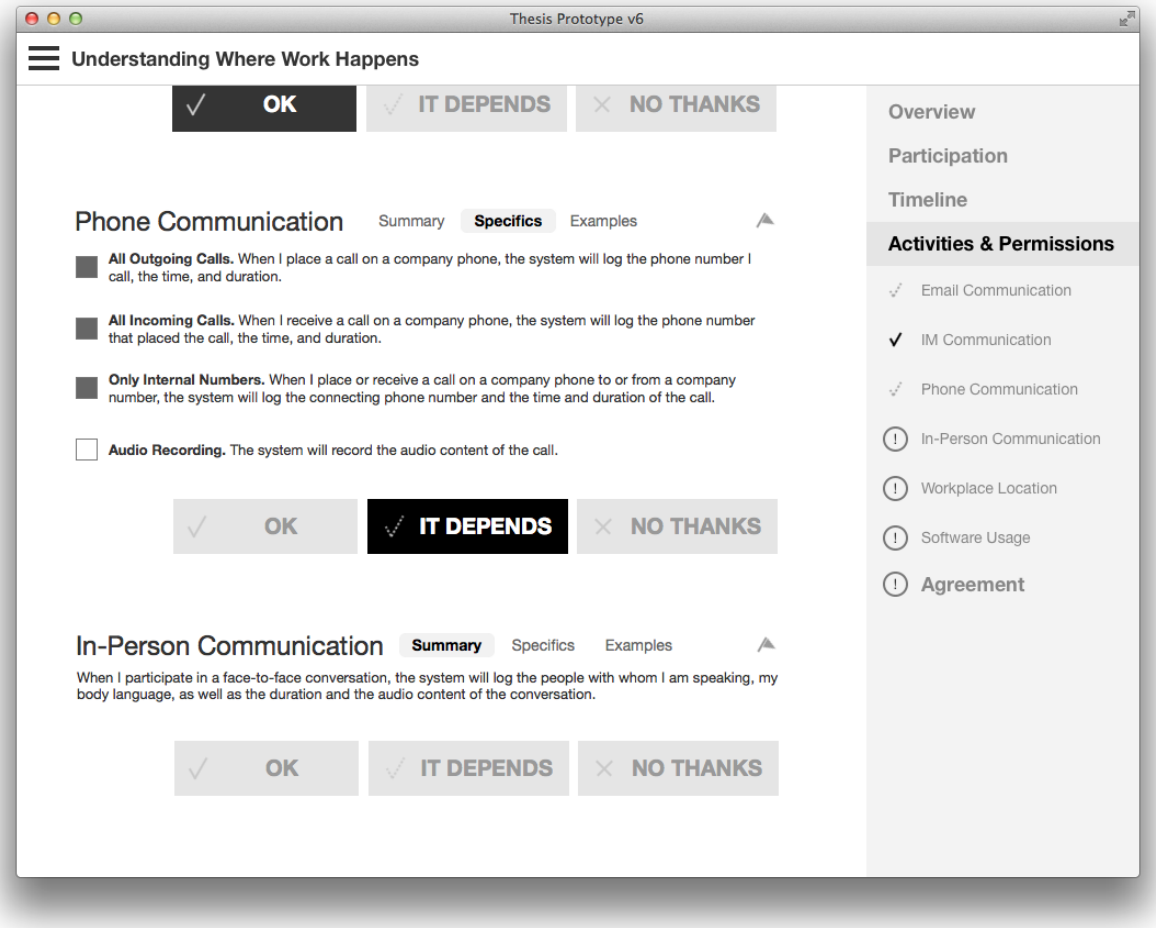

Figure 6.4: Study Overview, Activities & Permissions (Draft Prototype)

The Activities & Permissions section includes a sub-section for each activity the study intends to have surveilled. Each activity allowed the user to either quickly respond with an "Okay" or "No Thanks" button. If the user would like to fine tune their participation they could either click on the "It Depends" button or the "Specifics" tab. This exposes a checklist of all facets of the activity as the system intends to surveil it. The user can select specifically which attributes they are comfortable having surveilled.

Users can also view examples of what the data looks like when the system documents this type of activity. Additionally, there is an option for each activity to mark it as inappropriate and send feedback regarding its inappropriateness.

As the user responds to each sub-section, the related link in the anchor link panel updates with the status of the user's response.

Dashboard & Navigation Panel

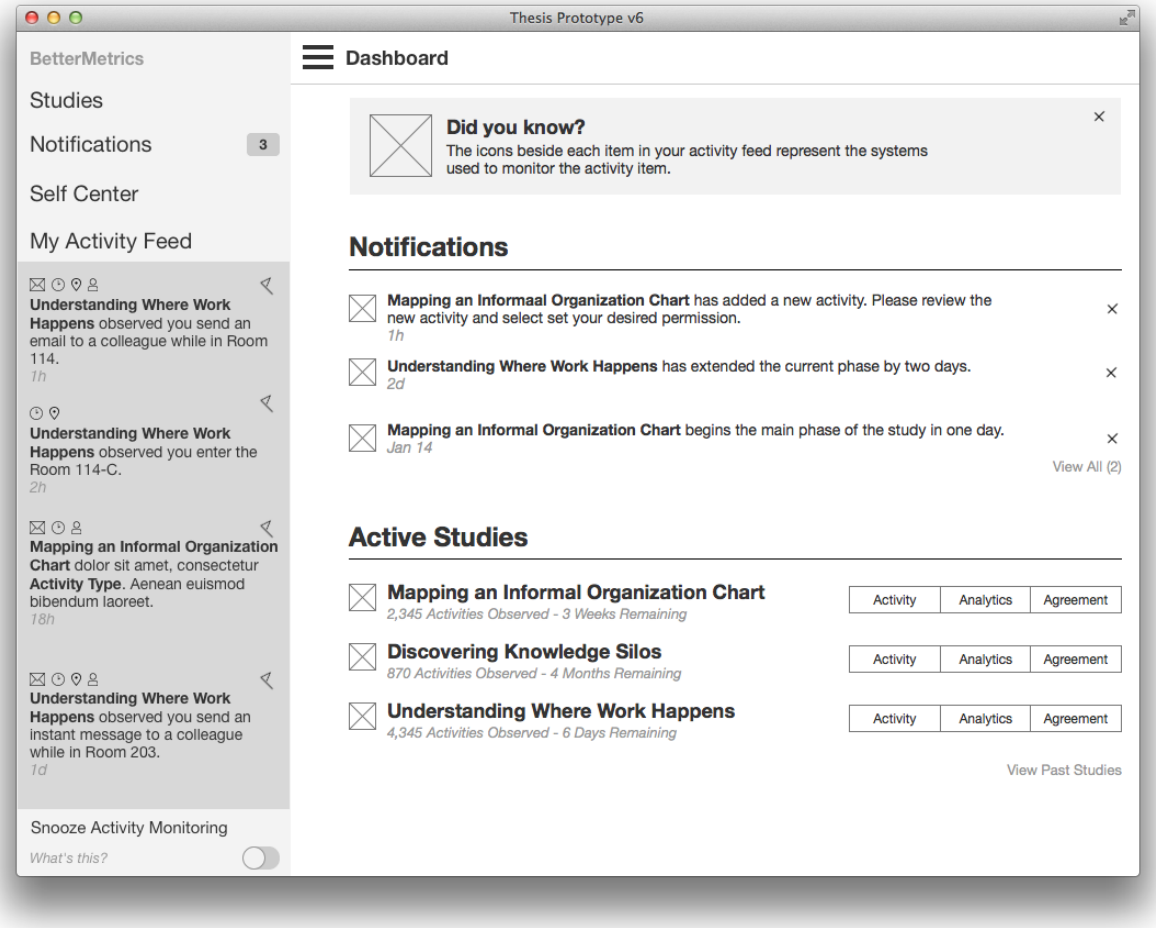

Figure 6.5: Dashboard with Expanded Navigation Panel (Draft Prototype)

Upon agreeing to participate in a study, the user is taken to their dashboard. The dashboard provides a listing of any current studies in which the user is participating, actionable notifications regarding said studies, and a listing of their recent activities that have been surveilled for any studies in which they are participating. Navigating the system is handled primarily via a navigation menu that is manually invoked, sliding in from the left side of the

screen. This menu contains the main sections of the system and potentially recent notifications or activities. A widget at the bottom of the navigation menu allows users to temporarily suspend (or "snooze") their participation in any active studies.

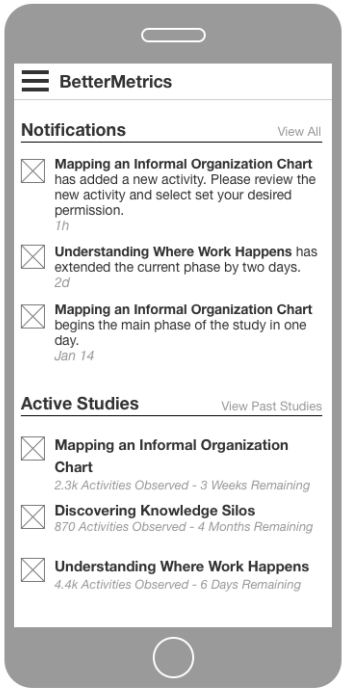

Figure 6.6: Dashboard (Draft Prototype, Mobile)

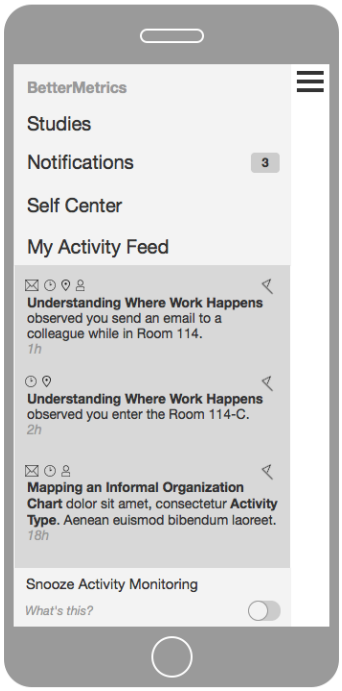

Figure 6.7: Navigation Panel (Draft Prototype, Mobile)

The mobile UI and desktop web UI designs were created simultaneously to ensure the interaction model could translate smoothly between platforms.

Single-Question Survey

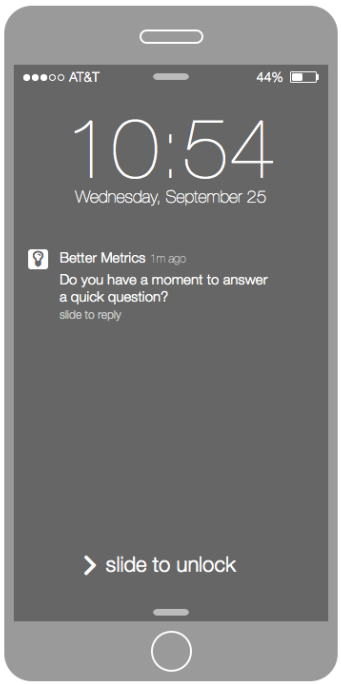

Figure 6.8: Survey Notification (Draft Prototype, Mobile)

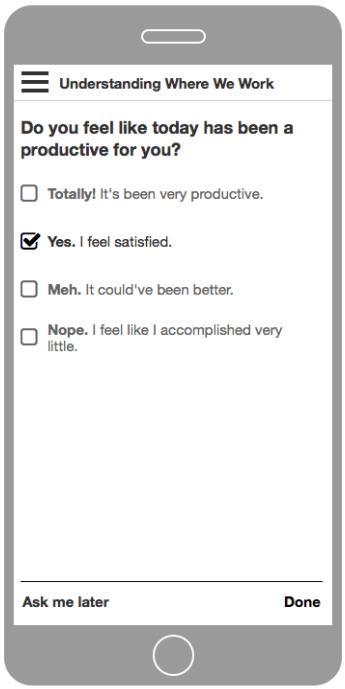

Figure 6.9: Survey (Draft Prototype, Mobile)

The Single-Question Survey is used to gather data from study participants throughout the study. Ideally this tactic would be deployed sparingly, as it risks conflicting with the principle to not disrupt work. The system could potentially leverage what it understands about what the user is currently doing to determine (a) whether or not they should be bothered to respond to a survey and (b) what the survey question should be about.

Insights

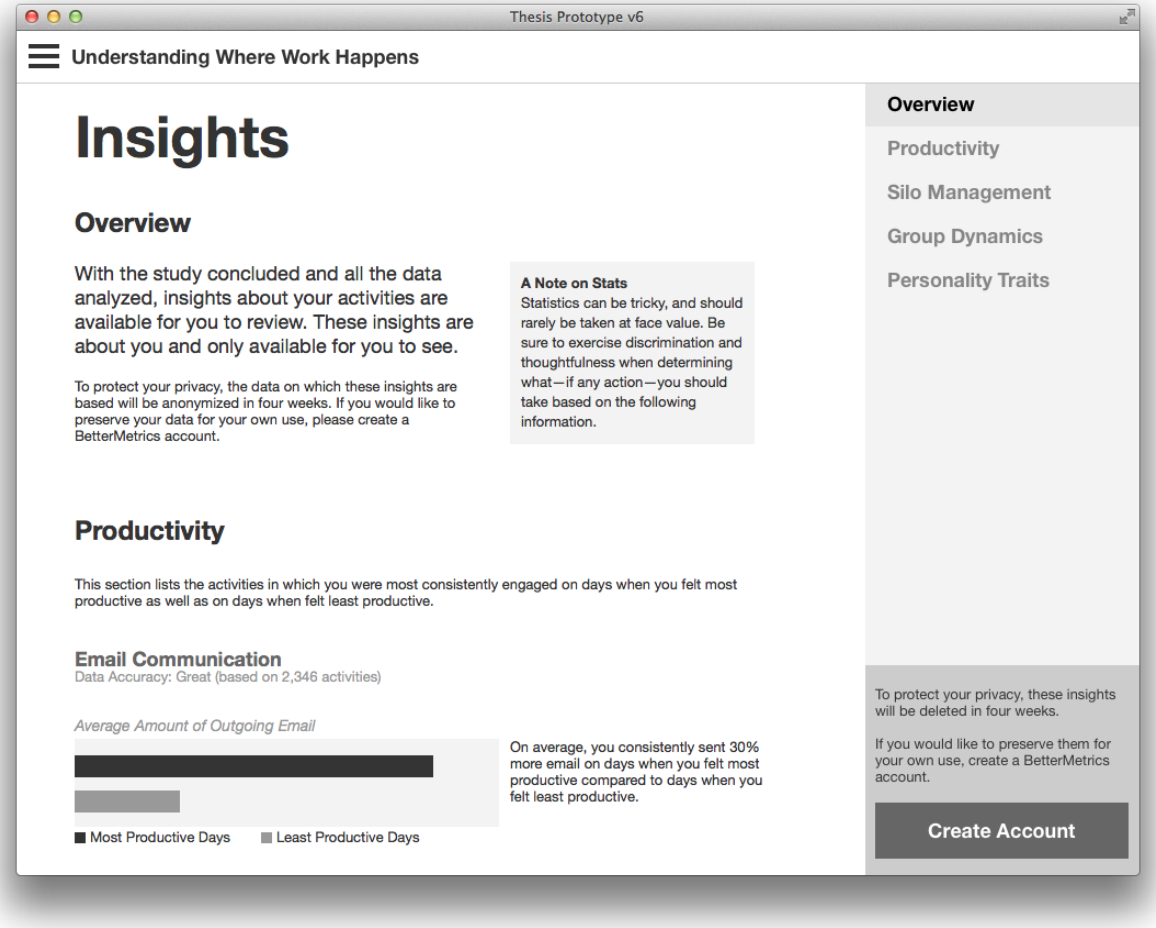

Figure 6.10: Insights (Draft Prototype)

The Insights screen contains the synthesized output from a study that has been tailored for the individual user. It provides information about the user's behavior during while participating in a study. Because there will likely be a lot of insights presented to the user for any given study, the page uses the same long-scrolling paradigm as the Study Overview screen, including the anchor link panel. This screen also prompts the user to create an account with the third party service that deploys and runs the studies.

Designing this screen for the prototype was particularly difficult mainly on account of not having a deep understanding of the types of analyses that could be run given a data set of human

behavior in the workplace. This would fall under the expertise of a computational social scientist and could easily justify separate project or projects. For the sake of my research, it was sufficient to put together a screen that communicated its premise to user testing participants.

Chapter VII: User Testing

The Alpha Prototype was deployed for user testing with seven study participants. The primary criteria in screening for participants was that they work for a medium (75+ employees) or large organization and spend the majority of their work time in an office in which they are co-located with their colleagues. This was indeed the case for the majority of participants. All but one user testing session was done in-person; the exception was handled via WebEx, and online meeting and collaboration tool.

All participants reported that they could see their employer rolling out some form of workplace analytics program in the near future. Most participants felt their employer was generally trustworthy and have had generally positive experiences with how their workplace is managed.

What follows is a breakdown of the scenarios used in each test session accompanied by the feedback themes found in observing and conversing with the participants. Please note that while there was a tremendous amount of actionable feedback gained from the test sessions, the following only covers the most dominant themes and findings pertinent to the thesis.

Scenario 1: Employee Responds to an Invitation

In this flow, the employee receives an email informing them they have been invited to participate in a particular study. They click the link to view the invitation in a browser. The invitation provides an overview of the study, the benefits it will provide for them as an individual

as well as their organization, why they have been invited, a timeline of the study, privacy guidelines to which the study will adhere, and most importantly a list of activities that will be observed for the study. The user is able to select which activities they are willing to allow to be observed. The employee submits the invitation confirmation.

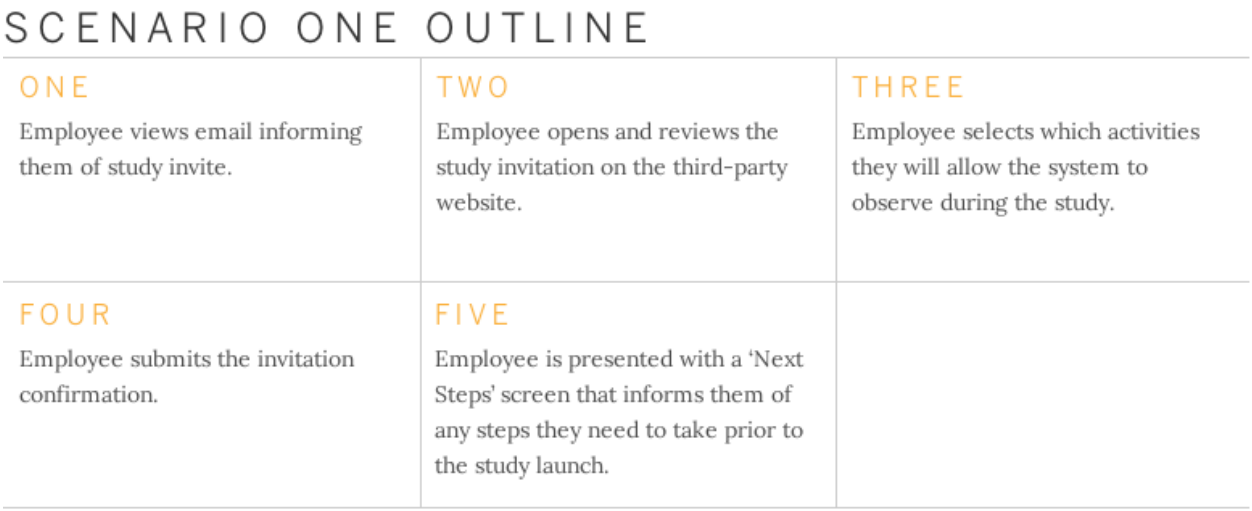

Figure 7.1: Scenario One Outline

Feedback Theme: The Big Picture

Perhaps one of the most problematic and apparent issues to surface from user testing was the failure of the UI to adequately and immediately inform the user about the general surveillance initiative. Said one participant as they were halfway through the first scenario, "I'm still not sure what is really being asked of me in terms of how much time this will take or what I will be doing; is it a survey?". Most participants did not begin to grasp what was being proposed until they started working through the more concrete "Activities & Permissions" section.

While it is good practice to not waste users' time and whittle a UX down to its most important moments (especially with enterprise software), the levels and methods of surveillance proposed by the prototype are foreign to most people. The UI needs to accommodate this fact by

better informing users upfront regarding what the initiative is and what participation looks like.

Similarly, some participants wanted more information upfront about the benefits participation might bring. These participants read through the benefits section in scenario one, but they didn't fully comprehend the benefit of personal insights until they saw the insights page in the last scenario. Again, the concept of personal analytics and the quantified self is unknown to the general public; thus, the UI should better accommodate this fact.

Feedback Theme: Information Density

Test participants felt a little overwhelmed at points as they worked through the study overview. The study overview page is chock full of information and inputs. This was intended by design. The interaction model of the long scrolling page with clear, persistent navigation has seen success in certain contexts—particularly with online forms. It allows for feedback regarding progression while also allowing the user to make non-linear jumps between content without page refreshes or navigating away from the page.

However, the study overview is not just a form, but it also has a lot of moments that don't require user input but contain content of which the user should be aware. In this way, it is mixed media and mixes modes of interactivity. An interaction model that provides better guidance or even steering of the user might be a better fit.

Information density also harmed the UX for certain participants, as key information in which they were interested (such as what the surveillance initiative is or how it could benefit them) was locked up in blocks of text. While they found the thoroughness of this copy helpful, the blocks of text were not immediately apparent or inviting.

Feedback Theme: Permissions

Users generally comprehended what each Activity & Permission question was asking of them. However, there were a few—such as those regarding in-person communication—that caused them to wonder how exactly this could be done. The content being harvested made sense, and participants completed the permissions without any problems, but they wanted to know if opting in meant that someone would be observing them in-person or if they would be wearing a device. They claimed the method might impact whether they would opt in or not.

Participants were surprisingly open when it came to volunteering the content of their conversations for surveillance. It seemed they generally felt the content of their conversations was always a professional nature and did not fear any recourse. Although, many participants did begin to hesitate when it came to volunteering the content of certain channels by which they entertain both professional and non-professional conversations. Mobile phones owned by the employer and IM were commonly cited as being such channels. Similarly, some participants mentioned a concern regarding the content of conversations given the context of non-disclosure agreements or general conversations with clients that may or may not understand they are being indirectly surveilled.

Some users mentioned an interest in having value propositions tied to each Activity & Permission prompt. This was particularly true when participants experienced the personal insights in the last scenario and made a connection between the data quality of the personal insights and how much they opt in for each channel of surveillance.

Feedback Theme: Email Delivery

A few participants that worked for very large organizations mentioned a concern about email as the sole mechanism of announcement and recruitment for a study. They cited the fact

that they frequently receive emails for various internal initiatives, and that it is easy for emails of this nature to be overlooked or outright ignored. Part of the solution to this risk would be to announce and recruit through multiple channels in the workplace: all hands meetings, one-on-one meeting between managers and their reports, signage, and so on. Another avenue to drive engagement might even be to introduce incentives—financial or otherwise—to drive engagement. However, these tactics (especially offering incentives) risk going against the design principle of playing down any aspect of the user experience that could come across as transactional. The concern would be that users might begin to suspect they are trading personal data for some material gain, because this is a tactic common to contemporary marketing and business campaigns.

Another avenue to increase visibility amidst the barrage of corporate communications is that of clear, high quality branding and user experience. Much of the user experience of communications and software in the corporate setting seriously lag behind what is available in consumer domain. Furthermore, this approach—high quality user experience—ties directly into the design principles that strive to establish trust between the user and the system.

Scenario 2: Employee Responds to a New Activity

When a new activity is added while a study is in-flight, they are notified and are given the opportunity to choose to have the new activity observed or not. The employee is notified via email of the new activity. They open the third-party website to view the new activity in greater detail. Upon deeper review, the employee finds the new activity to be invasive and damaging and flags it as such.

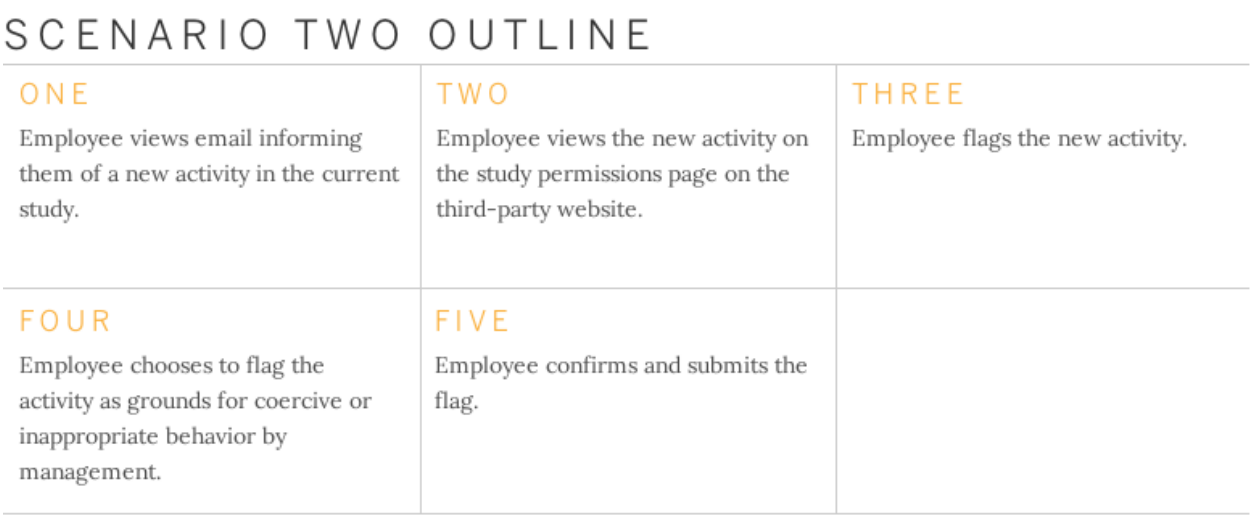

Figure 7.2: Scenario Two Outline

Feedback Theme: Flag Findability & Legibility

Only a minority of participants was able to understand the affordance for flagging a permission prompt as inappropriate. This seemed to largely be on account of the flag icon not representing recourse or communicating a request for censorship in the mind of the participants.

Feedback Theme: Not My Style

Upon further discussion with participants regarding real-time recourse in the context presented by the prototype, many of them disclosed they were much more likely to discuss the matter in-person with a manager than use the UI to provide this type of feedback. Most of the participants said they did not see themselves as the type of person to take any substantial recourse unless it was an extreme case, but they also did not think it likely their employer would create an extreme case.

When questioned if these tendencies to not provide recourse had any association with concerns of how they might come across or how they might be treated by management, only two participants let on they were slightly concerned about negative recourse against them. Most

participants did not fear recourse, but just did not see themselves being passionate or concerned enough to take recourse.

Scenario 3: Employee Responds to Survey

In order to gather direct data from the user that could not otherwise be gathered via hardware sensors, the system deploys very simple, single-question surveys via the mobile app that request feedback from the user.

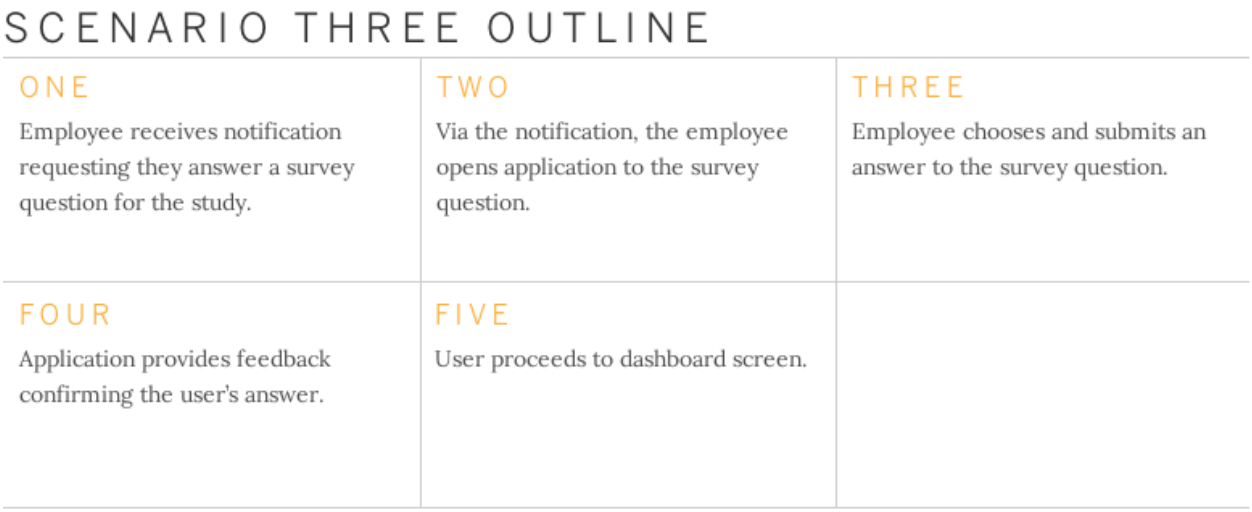

Figure 7.3: Scenario Three Outline

Feedback Theme: Single Question Surveys

At their first glance of the survey screen, most participants expected multiple questions. These participants claimed to feel a little annoyed at the notion of completing surveys on a frequent basis that included multiple questions. Upon learning the survey only had one question and were optional, most participants were no longer put off by the survey feature.

Feedback Theme: Activity Feed

Although it was not a part of the primary task of the theme, participants were asked to view the abbreviated Activity Feed in the mobile app's menu and provide their thoughts on what it was and how they might find it useful. All participants were able to quickly understand what it was and the content it was displaying. Likewise, all participants said they could see themselves using the Activity Feed to get a better understanding of how they appeared in the system. A few users said it would be a useful resource to determine if they should go back to the study overview and alter their level of participation. None of the participants saw themselves as regularly checking the content of their Activity Feed.

Scenario 4: Employee Suspends Participation

At any time during a study, an employee can choose to suspend—or "snooze"—their participation in a study. Doing so ceases all monitoring of study-sanctioned activities during the suspension.

Figure 7.4: Scenario Four Outline

Feedback Theme: Snoozing

Test participants liked this feature. Even those that said they probably wouldn't use it much or at all liked it nonetheless, because it communicated a degree of trustworthiness from

those deploying the study. It imparted a level of altruism to the employee and their privacy.

Amongst those participants that said they would likely use the feature, there were a couple that mentioned a desire for even more options and features to suspend their participation such as setting up a daily schedule that designated certain times of the day as being suspended from surveillance.

Scenario 5: Employee Reviews Study Results

When a study is completed, the system notifies the employee. The employee is then able to review the results of the study as insights for the individual employee.

Figure 7.5: Scenario Five Outline

Feedback Theme: Personal Insights

Most participants were at least mildly interested in this feature. Three participants were very interested. However, it is difficult to accurately gauge interest due to there being a lot of difficulty communicating its benefits without actual data and synthesized insights tailored for each participant. On a similar note, one of the participants later revealed their disinterest in this feature was largely due to their disbelief that it could offer truly useful insights or information of which they were not already aware. It is also worth noting this same participant also mentioned feeling a sense of duty to their workplace as the primary motivation for their participation—not

the benefit of gaining a better understanding of how they behave at work.

The ‘data accuracy’ that each insight module is tagged with felt honest and helpful to participants when they came to understand it. Participants claimed the language used to categorize levels of data fidelity (such as “okay”) felt vague and somewhat confusing.

Feedback Theme: Third Party Service

Participants were prompted at the end of the session if they understood who exactly was deploying the surveillance study. All participants understood it was a third party in charge of deploying the test. Likewise, all participants voiced a level of appreciation that a third party was handling it. “I like the idea that this data is not necessarily going straight to the HR department,” stated one participant.

Four of the participants claimed they would probably create an account with the third party service to preserve their data and combine it with further studies deployed by the third party. Three participants said they probably wouldn’t. Again, this had to do with a general disinterest in personal analytics. One participant who appreciated that the prototype promised to anonymize their personal data cited concern at the notion of preserving their data—making it susceptible to data breaches—as opposed to allowing it to be disassociated from any identifying qualities.

Chapter VIII: Revised Prototype Design

Having synthesized and consolidated feedback, it was time to integrate it into the prototype and created the next version. In addition to updating the interaction of the prototype, I also applied a visual design direction to the prototype. The aesthetic attempts to follow the design principles as much as possible. This resulted in a visual design that attempts to be

engaging and interesting while maintaining a level of professionalism and clarity. The iconography becomes as much about communicating simply and clearly as it is about extending the aesthetic. A few moments in the slideshow use the iconography the introduce hints of playfulness as a means of humanizing the user experience.

What follows is a walkthrough of the highlights of the revised prototype with commentary regarding the major changes.

Study Overview

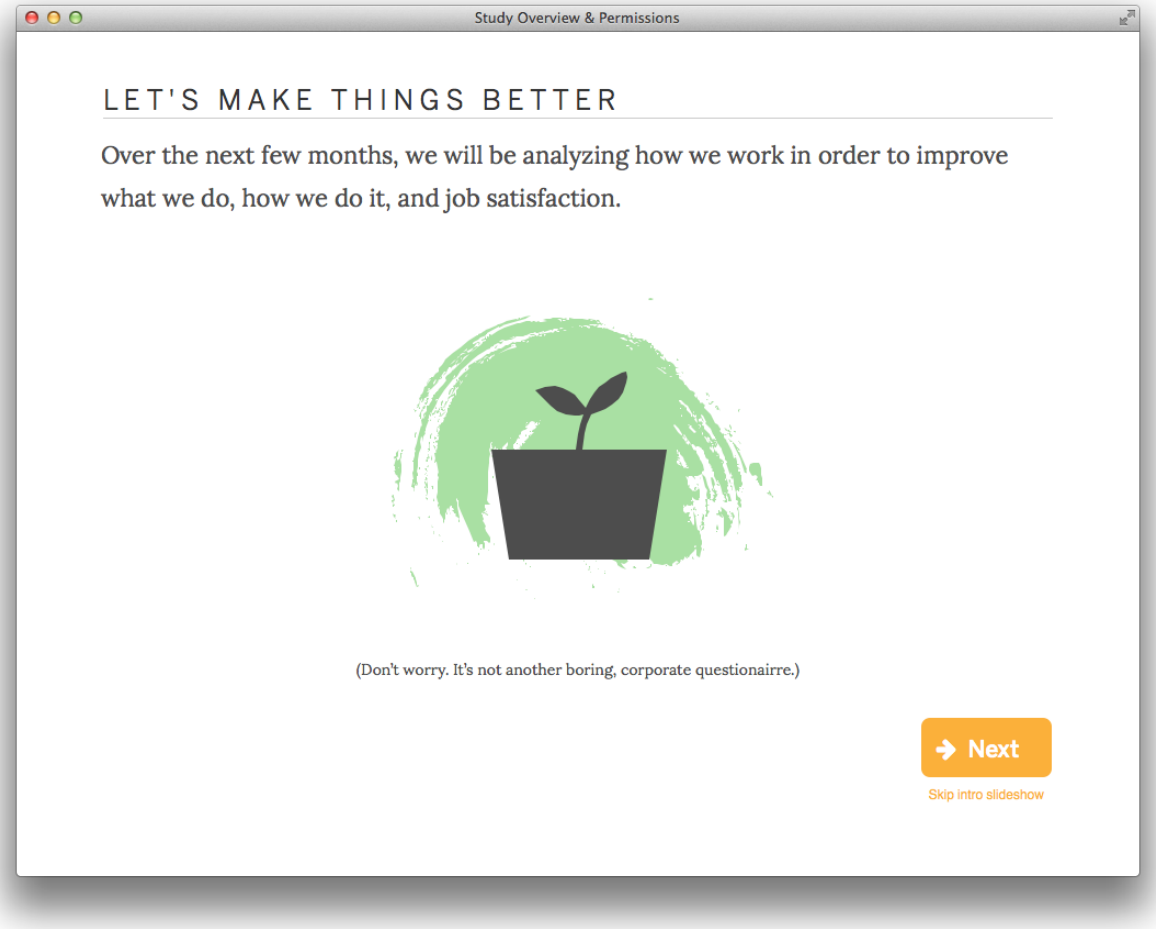

Figure 8.1: Opening Slide of Intro Slideshow, Study Overview (Revised Prototype)

In addressing one of the biggest feedback themes from the usability test, I separated the

Study Overview into two basic sections with their own unique modes of interaction. The first is the Intro Slideshow. Its purpose is to more fully educate the user about the study. It covers the study purpose, goals, and schedule. It also covers topics such as personal benefits for participants and how personal data will be processed.

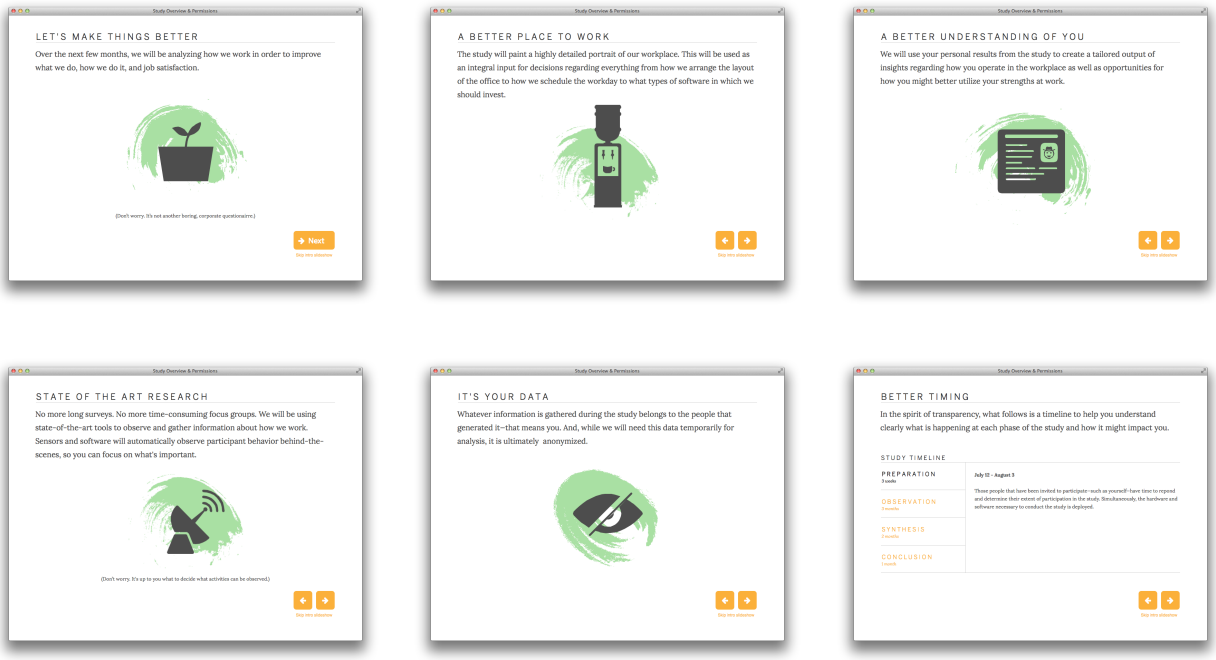

Figure 8.2: Intro Slideshow States, Study Overview (Revised Prototype)

Upon stepping through (or skipping) the Intro Slideshow, the user enters the primary section of the Study Overview. Whereas the Intro Slideshow is intended to purely inform and orient the user, the primary section is all about the user taking action to customize their participation. This section includes sub-sections for each activity the study intends to surveil as well as the legal terms for the study. The user must take action on each before they can submit their participation.

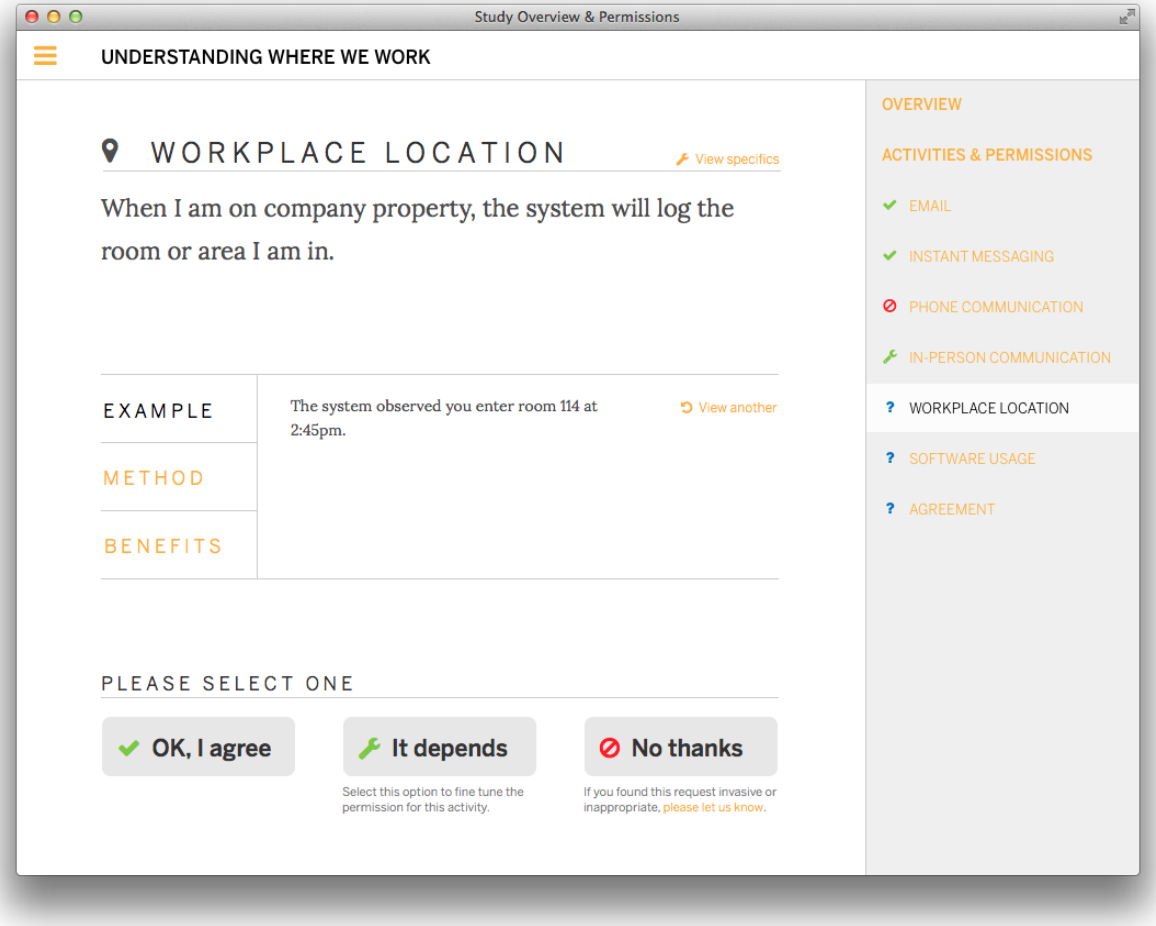

Figure 8.3: Activities & Permissions, Study Overview (Revised Prototype)

The anchor link panel widget remains in the revised prototype as it was well received in testing. However, the primary content area now behaves more like a slideshow. The user can still scroll vertically through the content. However, when the manual scroll action is complete, the page smoothly scrolls such that a single sub-section fills the primary content area. This is intended to reinforce the user's focus.

Each Activity now includes a tabbed area allowing the user to browse examples of how they might appear in the system should they choose to participate in an activity, better understand how having this activity observed will impact their workday during the study, and to gain a better idea of how volunteering to have an activity observed can benefit them.

The revised prototype slightly adjusted and cleaned up the interactions surrounding the ability of users to fine tune the specifics of how an activity is observed by the system. In the previous prototype, expanding an activity sub-section accessed these options. In the revised version, this behavior is more of a mode switch. This is to prevent some of the confusion that occurred in the usability testing that resulted from having the default and advanced options capable of existing in close proximity simultaneously.

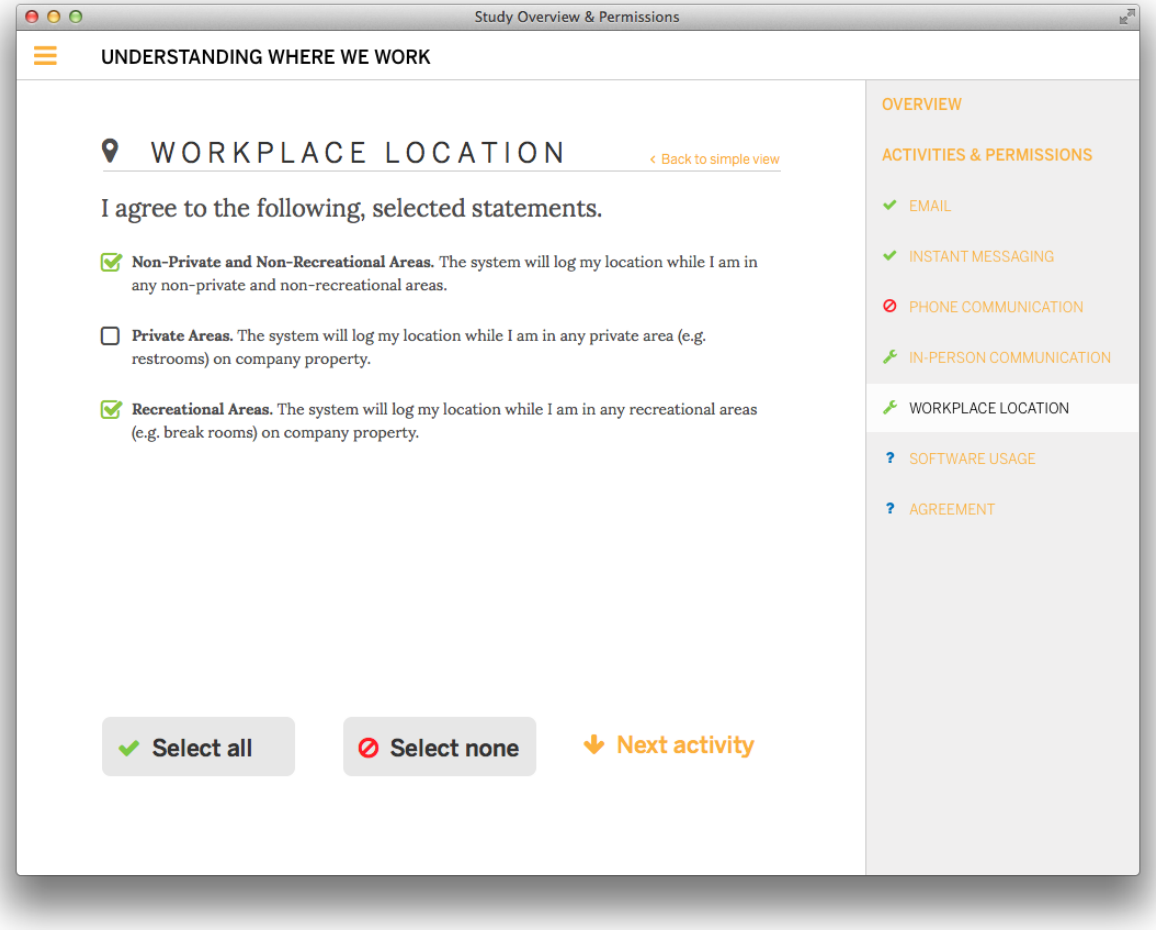

Figure 8.4: Activity Specifics, Study Overview (Revised Prototype)

The last section is the Participant Agreement. In terms of content and purpose, there are only mild changes between the previous and revised prototype. I emphasized the summary statements, as those were well received in the usability tests. I also dramatically emphasized the

'I Agree' checkbox, as many users in the usability tests had a difficult time locating it.

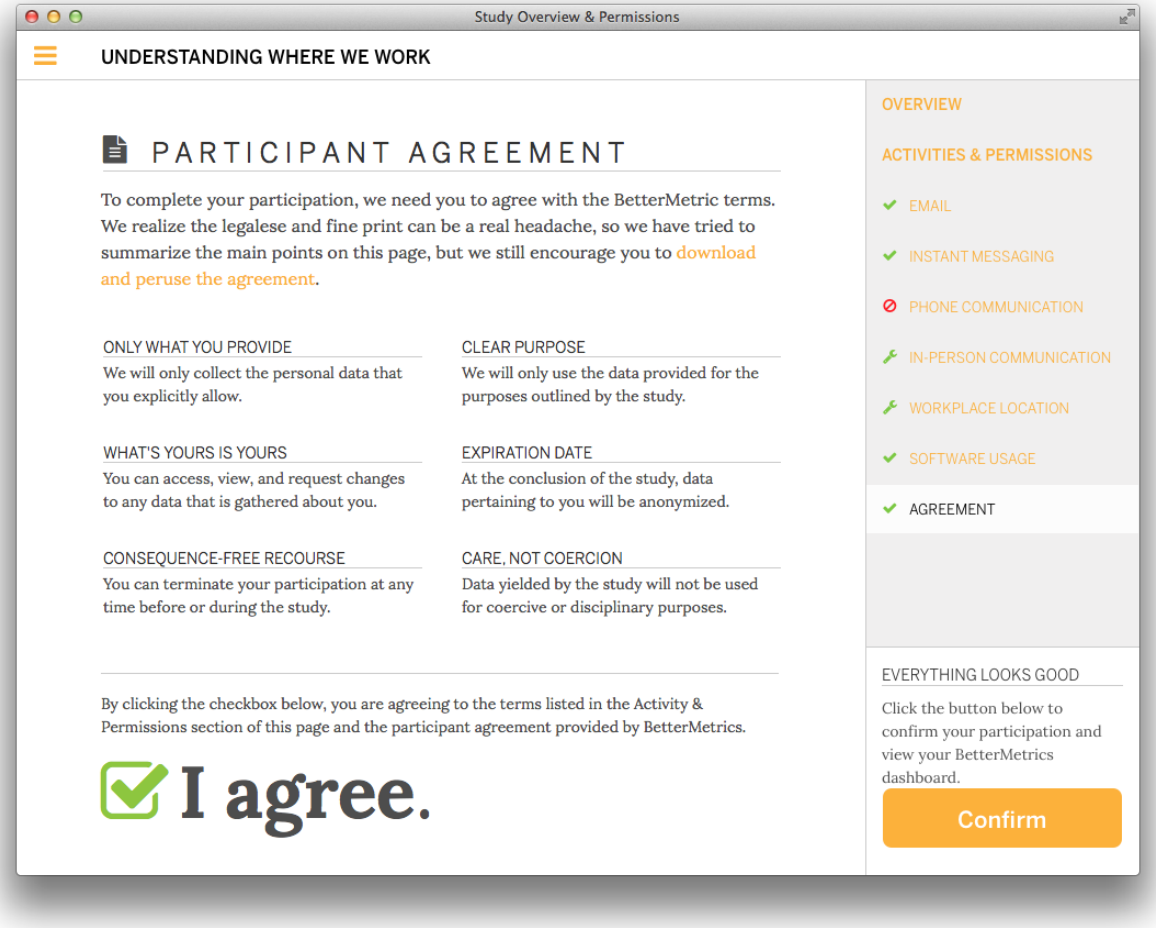

Figure 8.5: Participant Agreement, Study Overview (Revised Prototype)

Single-Question Survey

Due to a mild, initial concern from some usability test participants regarding the potential interruptive nature of the Single-Question Survey feature, I did some superficial redesigning in hopes of making this moment feel somewhat more delightful. Because I imagine this survey often being used to measure participant attributes that are more subjective or emotional in nature, I moved away from the clean but sterile aesthetic seen in the previous prototype. The question now includes a degree of playfulness both in the visual design and the interaction. The user can

horizontally swipe to browse the different choices available to them, and these choices have a visual and textual representation.

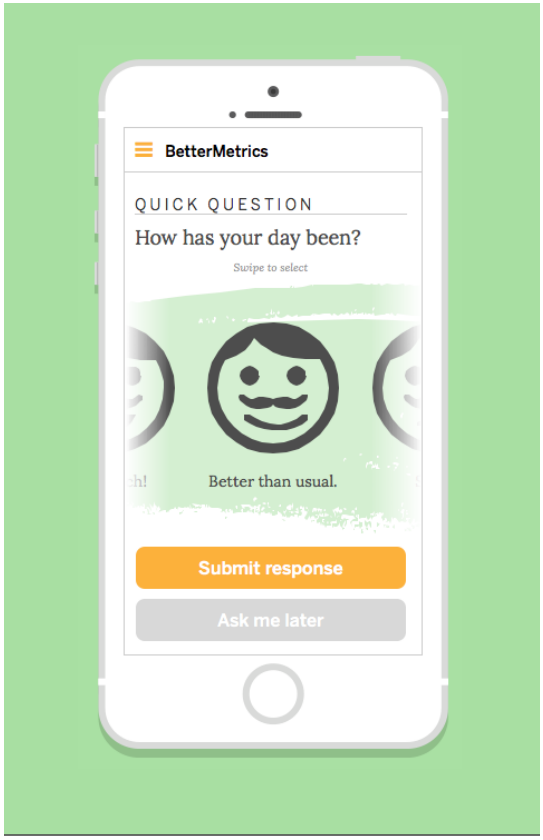

Figure 8.6: Survey Question (Revised Prototype, Mobile)

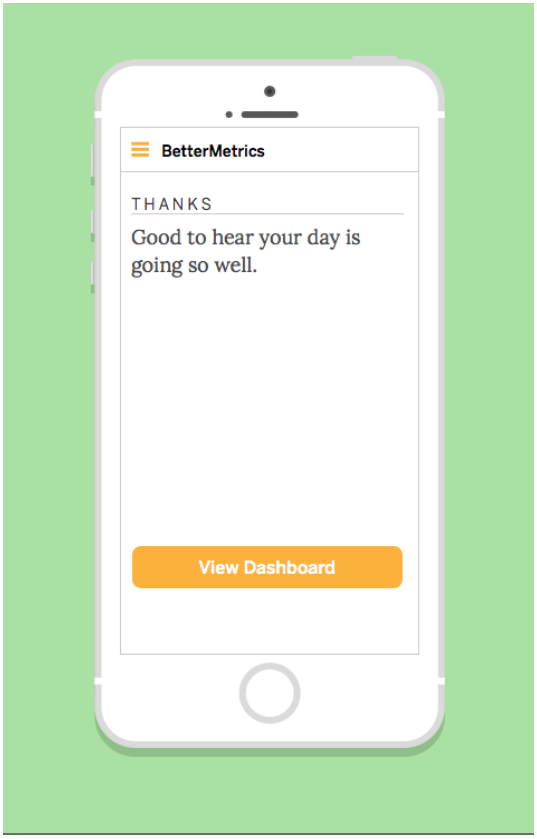

Figure 8.7: Survey Confirmation (Revised Prototype, Mobile)

Personal Insights

The same difficulty that I encountered when first designing the Personal Insights screen for the initial prototype was still present when re-designing it for the revised prototype. Basically, it is difficult to determine what the content would actually be. It would rely heavily on several variables such as what technologies and sensors would be present for a given study and the technical interplay between the specific permissions granted by a user and the algorithms that

will derive the insights. Furthermore, driving down to the specific data visualizations that would be most appropriate for communicating this type of information is a thesis project unto itself. Nonetheless, the Insights page was tweaked for the revised prototype.

The intro section provides a more heroic, grounding moment before sending the user into a long-scrolling page of data visualization. The ability to select different studies has been integrated. The prompt for the user to save their insights—seen in the lower right side of the screen—remains fundamentally the same as seen in the initial prototype. This is due to the positive response from some usability test participants that they would indeed be interested in creating an account and saving their data for later viewing.

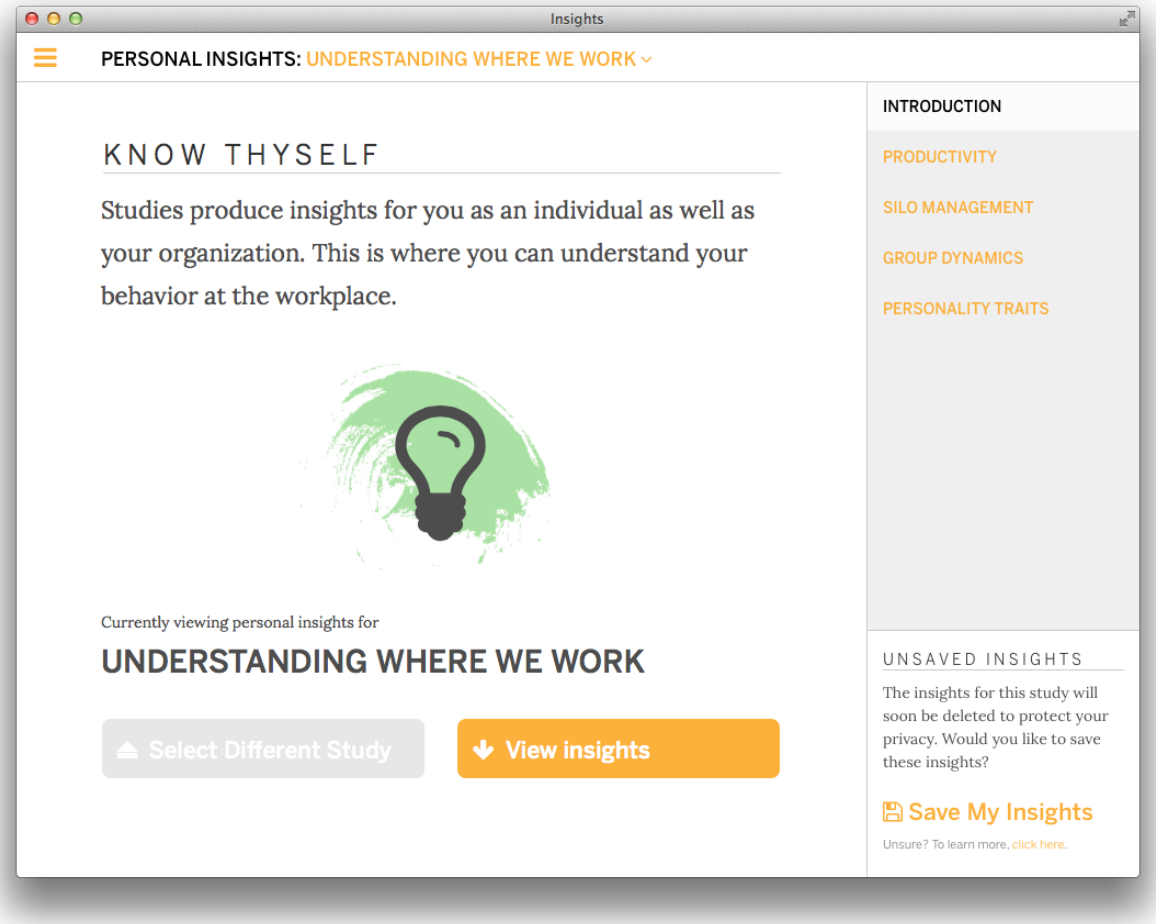

Figure 8.8: Introduction, Personal Insights (Revised Prototype)

While the Personal Insights page maintains the long-scroll design it had in the initial prototype, several of the visualizations have been collapsed into a smaller set of widgets wherein the visualizations are accessed via dropdown menus. Each widget represents a category of graphs. For example, the Email Communication widget in the Productivity section contains all data visualizations regarding Email Communication. Each widget also contains feedback regarding the accuracy of the insight it contains. The concept of this feature was well received in the usability tests, but it's intent was not immediately clear to most users. One user did not initially notice it. The revised design calls more attention the Data Accuracy feature and includes a tool tip that explains its intent.

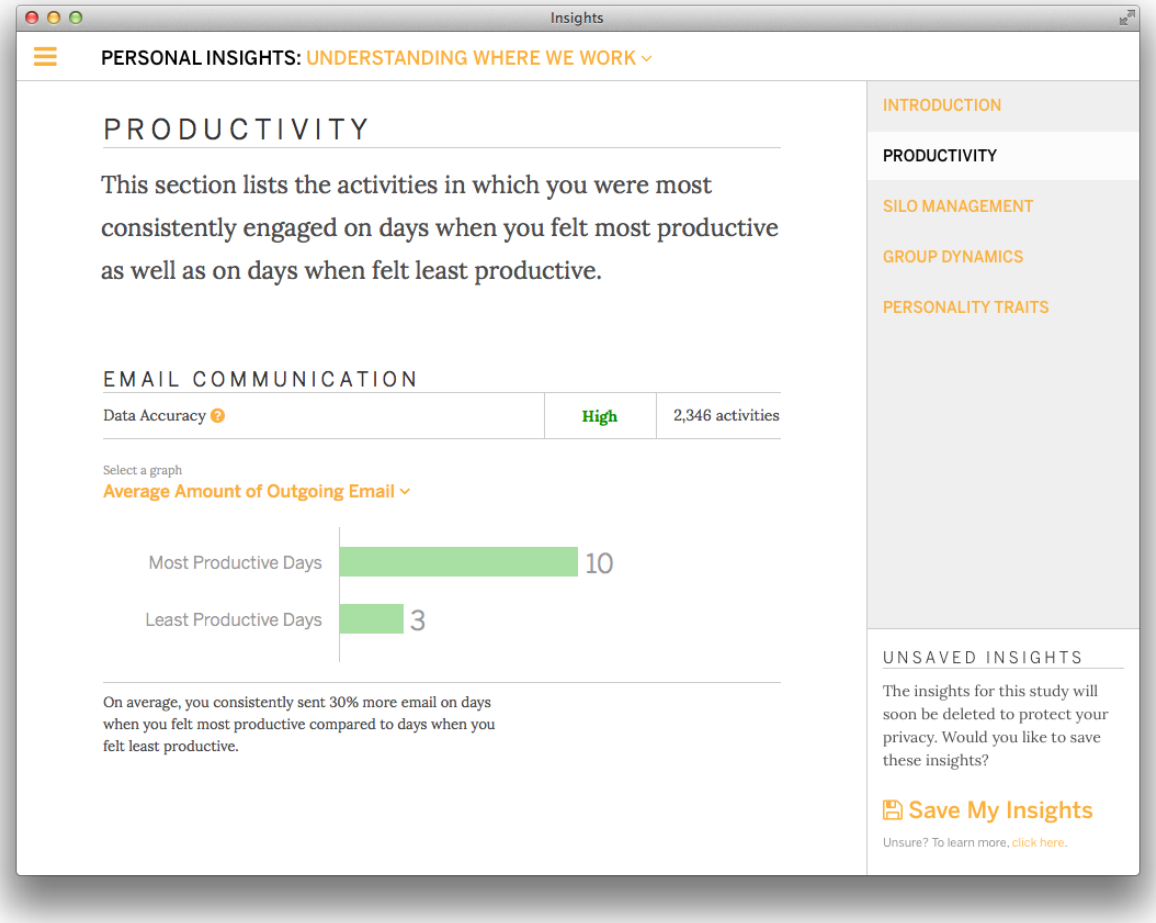

Figure 8.9: Productivity, Personal Insights (Revised Prototype)

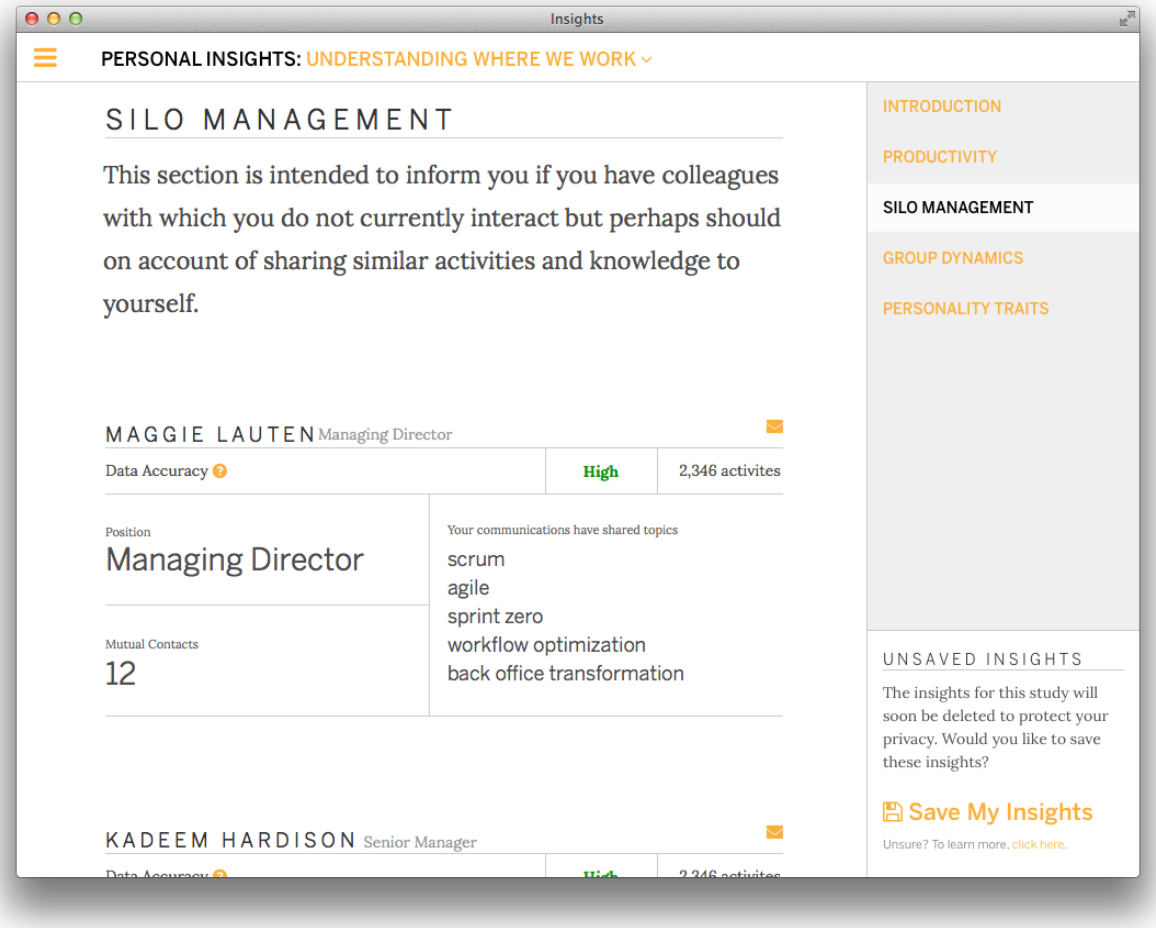

Figure 8.10: Silo Management, Personal Insights (Revised Prototype)

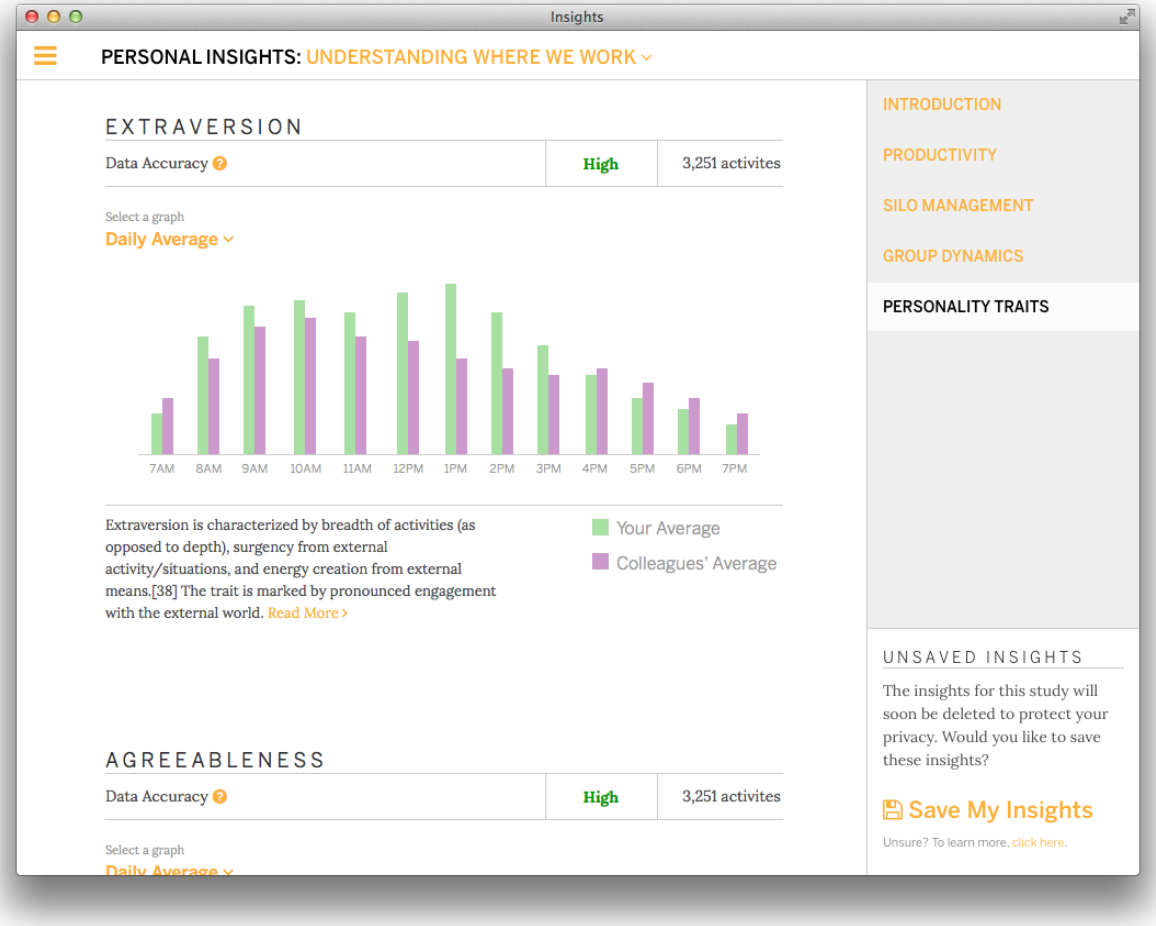

Figure 8.11: Personality Traits, Personal Insights (Revised Prototype)

Chapter IX: Conclusion

Regarding Trustworthiness

Based on the feedback received from participants in the user testing, the approach taken has resulted in a user experience that engenders trust. Transparency, clarity, and control were cited by test participants as the reason for its trustworthiness. The initial prototype had some issues in user testing regarding clarity of methods of surveillance that resulted in some suspicion or doubt. However, steps have been taken in the revised prototype to increase clarity and mitigate these issues.

On the subject of trust, it should also be mentioned that users approached this interface with a lens that had already been established with their relationship to their organization. Those who already had a generally trusting relationship often glided through the prototype with little concern about their personal data was to be handled. The trustworthiness they experienced in the prototype was analogous with their current understanding of how their organization treats employees. The few participants who had some mistrust towards their employer approached the prototype with more skepticism. However, it should be noted that these participants still viewed the UI itself as being trustworthy due to its transparency, clarity, and degree of control it allowed. For these participants, an interface such as what is seen in the prototype would be a move towards establishing trust between employee and organization.

What remains a hypothesis at this point is the notion that a user interface that allows for "line item" control of participation in workplace surveillance is more likely to result in employees volunteering more of their personal data than that of a user interface that offers binary participation. While I believe the hypothesis to be true based on the anecdotal evidence observed in the user testing for this project, an additional study with a much larger sampling of participants would be required to draw a conclusion.

Regarding Methods

In the process of creating the initial and revised prototype, I never came across a particularly novel interaction pattern or widget that espoused trustworthiness. If anything, designing the prototype has been in exercise in the fundamentals of interaction and user interface design. The novelty to be found in this project is more in regards to the application of human-centered design fundamentals to the nascent fields of computational social science and state-of-the-art, deeply connected surveillance in the context of the workplace.

I believe there is another, more subtle novelty in this project, and it has everything to do with privacy policies, terms of service agreements, and other similar documents. These are not new, but it is peculiar and unfortunate how little these documents fall under the purview of design. The prototype included some human-centered design when it came to the agreement document, and test participants greatly appreciated it. Frankly, it required little effort and, for the test participants, it seemed to bridge a wide chasm of legalese. There is a tremendous, immediate opportunity for human-centered design of these documents—in all arenas of commerce, research, and so on—to be overhauled with fundamentals of human-centered design.

Regarding Provocation

The breed of design I have employed for the current iteration is conventional and focused on achieving the goals of all involved parties as directly and friendly as possible. This results in a smooth process that can be executed quickly and as clearly as possible. While this approach has yielded several important, worthwhile interaction patterns and design principles, I don't believe it is sufficient in beginning to address some of the deepest, most difficult issues that are beginning and will continue to crop up with inherently surveilling information products. Evgeny Morozov articulates one of the core needs that results from such privacy issues:

> [W]e need more provocative digital services. It's not enough for a website to prompt us to decide who should see our data. Instead it should reawaken our own imaginations. Designed right, sites would not nudge citizens to either guard or share their private information but would reveal the hidden political dimensions to various acts of information sharing. We don't want an electronic butler—we want an electronic provocateur. Instead of yet another app that could tell us how much money we can save by monitoring our exercise routine, we need an app that can

> tell us how many people are likely to lose health insurance if the insurance industry has as much data as the NSA, most of it contributed by consumers like us. Eventually we might discern such dimensions on our own, without any technological prompts.

Thus, if I am to continue exploring this vein of research and design, provocation is an area of study and a design mechanism I would integrate immediately. Some of the first steps taken would be gaining a strong familiarity with the works of design provocateurs such as Anthony Dunne, Fiona Raby, Natalie Jeremijenko, and other similar designers that have made marks in the small but important fields of critical design, adversarial design, and tactical media.

Regarding Third Party Facilitation

While design a business model is not the goal of this thesis, many benefits of such a service being operated by a third party were discovered when designing and testing the prototype. Almost all test participants appreciated the notion of the study being facilitated by an outside organization—even those that had a high degree of trust towards their organization. I suspect the precedence set by the third party organizations that execute background checks for employers could be influential in this notion of the neutrality of third parties given the context of sensitive, personal data in the workplace.

Upon further discussion, a few participants cited an expectation of expertise when dealing with an outside organization that is wholly focused on deploying these studies. In addition to building up expertise on the subject matter of computational social science for the workplace, a third-party consultancy would also be able to build up an increasingly strong and robust pattern language for the overall user experience of workplace studies. Lastly, there is a notion of finitude that a third-party brings with it; whereas, an in-house deployment is more

likely to always be on, always be monitoring.

However, this is not to say that these studies could not be run in-house and be run responsibly. In a categorical sense, many of the activities and information facilitated and processed by such studies would fall naturally in the domain of human resource departments, which is an operation that currently exists in most organizations and is familiar to the workforce. There has even been a trend over the past few years of human resources department of large organizations hiring full-time data scientists to capture, process, and analyze data regarding current and potential talent.

Regarding Legislation

The prototype proves the beginnings of a system that is indeed capable of facilitating the communication and negotiation of policies regarding workplace surveillance. Given such systems, it becomes easier to imagine a future in which individuals and organizations can successfully co-determine an array of policies with one another.

> Ideally, the United State may arrive at the point where employers and employees work together to codetermine the workplace environment; however, until American perception of the employment relationship shifts to acknowledge a stronger role for the employee as citizen, this is unlikely to happen. In the absence of cultural change such that American workers are seen as citizens and not just employees, courts or the United States government will have to proactively protect employee privacy. (Evans 1143)

Without a doubt, there are many organizations that want to take advantage of computational social science to better their operations and want to do it in a way that is respectful of their employees. However, there are many organizations that have little to no

interest in preserving the privacy of their employees—especially if it might mean getting in the way of a tool that promises high returns. Good design—unless we are applying the word "design" to legislation—cannot protect employees from these organizations. Given this and the inevitability of increasingly surveilled workplaces, I believe there is as much an immediate need for improved rights for employees in the US as there is for the human-centered design of the systems that will facilitate the surveilled workplace.

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