

Playing The Part: Introducing Facebook Roles

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1 Introduction

In this paper, we present a set of design solutions to the problem many users face on Facebook in regards to managing self-presentation and sharing behavior in the setting of collapsed contexts and audiences. First we review literature that contributes to the definition and understanding of the problem and other attempted solutions. Then we describe our own user research and its results. Next we describe the design solutions we would employ, namely that of a role-based interface design supported by ongoing data collection. Finally we describe limitations and assumptions of this project, as well as further research, design iterations, and next steps.

This project focuses on Facebook exclusively. However, in order to introduce this domain and the design problem, in this section we discuss Social Network Sites broadly, how and why they are used, and why users experience anxiety and frustration when trying to control access to personal information and manage impressions (Wisniewski, Richter, & Wilson, 2012).

Social Network Sites (SNSs) are “bounded web-based services that allow individuals to (1) construct a profile, (2) articulate a list of other users with whom they share a connection, and (3) view their list of connections and connections of other users” (boyd, 2007). In addition to these common SNS functions, Facebook supports various forms of communication, including wall posts, comments on user-generated content, and private and instant messages. SNSs are used across the world and have become exceedingly popular in the past five years. Users of SNSs, including Facebook, typically report using SNSs to support already existing relationships, though, some SNSs connect strangers who have an interest or hobby in common (boyd & Ellison, 2007). Our user research produced the same conclusion; this will be discussed in-depth later on.

SNS use presents an opportunity for extending of our offline relationships. Meta-analysis has revealed that individuals use SNSs because of two needs: the need for self-presentation and the need to belong (Nadkarni & Hofmann, 2012). Here we focus primarily on self-presentation, or the effort to control perceptions of oneself that are formed by others. Facebook users make decisions about what types of information to share and with whom as part of a highly nuanced, dynamic, and constantly renegotiated effort to manage their online self-presentation.

With the use of SNSs being so widespread, clearly users see many benefits of the online presence and communication supported by SNSs. Investment in relationships with others and the shared sense of trust that can develop provides benefits for an individual, known as social capital (Burke & Kraut, 2013). SNSs allow users to expand their social networks by creating a greater number of weak ties. Use of SNSs can increase one’s social capital and this likely provides motivation for using SNSs (Binder, Howes, & Sutcliffe, 2009). However, the presence of weak ties in one’s Friend List often leads to privacy challenges and boundary tensions, as individuals from many parts of the user’s life are conflated into

one coherent network and audience.

As a relatively new social domain, SNSs unsurprisingly face problems of privacy and engagement, many of which may result from user interface design decisions. Through our research into SNSs and their usage, we identify problems that we believe can be rectified through a new model and UI changes. We propose a role-based model for managing data and content, an intuitive UI for sorting friends, and a method of gathering small but valuable pieces of data continually.

We begin with a thorough look at the domain of SNSs, then follow with a description and rationale of our design proposal.

2 Research

Here we use our academic and user research to describe an analytical framework for understanding how individuals use and interact within SNSs, as well as discrepancies between communication supported by Facebook and the communication users naturally engage in offline.

2.1 Literature Research

The social presentation and behavior of individuals is characterized by highly nuanced and typically unarticulated negotiations, considerations, and boundaries. The structure and function of technological platforms present significant limitations in extending offline relationships into online domains. Managing self-presentation, negotiating privacy, and knowing one's audience are examples of such limitations and are described here in depth.

2.1.1 Presentation of Self

Individuals have specific ways they want to be seen by the different people in their lives. We want to control the impressions we make on people around us and we naturally play different roles in our lives in order to do this. Goffman refers to this as the 'front.' We want our impressions to be favorable and therefore are constantly taking cues from our environment, or 'props', and from those around us to flex our behavior to maintain a specific impression. Goffman says individuals are motivated to do this by a desire to move to a higher social strata (Goffman, 1959).

Individuals' behavior changes based on who one is interacting with or who is in the audience. When one does not know who is in the audience, as in when the audience is hidden, distorted or obscured, individuals will inventory clues about the audience and then draw conclusions to form an imagined audience (Litt, 2012). When misalignment occurs between one's perception of the audience and the actual audience, communication problems may arise. However, communication can be tailored and effective when the speaker has an accurate perception of the audience.

Barbour and colleagues (2012) describe how academics use different computer mediated communication (CMC) tools to create multiple differentiated personas online. The online personas of an academic have differing objectives and purposes. They may be characterized by different tones (formal, informal, etc.), function (tailored, broadcast, narrowcast), style (collaborative, interactive, or

presentation), and with varying audiences (students, faculty colleagues, peers within the field, etc.) This analysis of how academics leverage CMC shows the clear distinction between roles filled by individuals in their use of online communication. Obviously, Facebook users' objectives are narrower and Facebook is not meant to fill all these roles. However, these online personas offer a helpful framework for understanding the nuances of communication and boundaries of relationships that are enacted on Facebook when users are actively maintaining and trying to enrich a variety of types of relationships. (Barbour, Kim & Marshall, 2012)

Facebook as a SNS provides users with limited options for how to present themselves when compared with options available in face-to-face interactions. For example, components that influence communication such as body language; tone; physical and geographical setting; presence of others; and the ability to tailor message content, tone, and language choices to a unique audience are often restricted in Facebook communication, as in many CMC mediums (Erickson & Kellogg, 2000).

2.1.2 Social-Technical Gap and Context Collapse

Ackerman describes the “social-technical gap” that exists between what we must support socially and what can be supported in a technical system. Social activity and behavior are highly nuanced, fluid, and dynamic. Individuals are constantly recalculating their behavior based on interactions and feedback from others and are constantly renegotiating privacy and intimacy boundaries with others. In everyday life, individuals effortlessly and seamlessly ‘assign’ their social connections to various groups with varying levels of access and engagement. However, SNSs are binary and built on a system of set rules that are typically not sensitive to nor representative of the very complex nature of human social interactions.

For example, boyd points out that computers cannot differentiate between articulated and behavioral social networks. Facebook does not provide unique communication and relational opportunities for users with their closest offline friends, those likely in the behavioral social network. Facebook only knows the friend list articulated by the user – the articulated network.

The default behavior of Facebook collapses traditionally and physically separate context and audiences, a phenomenon referred to as “context collapse” (Marwick & boyd, 2011; Litt, 2012). For example, the self-presentation style in one’s workplace is generally very different from the self-presentation to one’s family, to one’s close friends, or to one’s co-workers (Goffman, 1959). The ability to manage these impressions is challenged when all of those audiences are conflated into a single network. Research conducted by DiMicco & Millen (2007) illustrated the difficulty of using a single Facebook account to maintain relationships with one’s workplace connections as well as those from other parts of life, such as college friends, family, and other more personal relationships. Users spoke to the tension created when trying to simultaneously manage self-presentation for a professional audience and a non-professional audience under Facebook’s current structure and affordances.

A related phenomenon has been described as conflicting social spheres. A social sphere is defined here as an ego- or self-centric network with many internal connections but few connections to other networks. Social spheres typically are characterized by distinct norms in the style and content of communication that takes place within that sphere. When a user shares content or information that is

intended for an audience defined in one sphere but is in fact consumed by audiences in another sphere, social tension can result (Binder et al., 2009). For example, one's work colleagues can represent one social sphere and hometown friends another. An individual might engage in different types and forms of communication with these two groups with an implicit desire to keep them separate.

In face-to-face interactions, it is taken for granted that individuals know who is present in a shared physical space. This awareness guides our behavior because it leads to our understanding of privacy, our knowledge of the audience, and the potentialities of information leakage and whether those leakages might be controlled (Ackerman, 2000). Many SNSs, Facebook included, lack the degree of social translucence that consistently instills an awareness of who is in the audience, who might be inadvertently privy to a communication that is intended to be targeted rather than broadcast (Erickson & Kellogg, 2000). Misalignment between audiences online is "more dangerous since larger audiences mean more eyes judging, and ready to catch social *faux pas*" (Litt, 2012).

2.1.3 Negotiating Privacy

Petronio's Communication Privacy Management theory provides a framework for understanding privacy issues. Privacy is defined as the feeling that one has the right to own private information, to determine how such information is disclosed to others. Privacy enables us to feel separate from others, while disclosure enables us to increase social control, validate perspectives, and become more intimate. CPM theory presumes people make choices about revealing and concealing information and defines three primary activities for privacy management: creating privacy rules, co-management of privacy boundaries (with other involved parties), and boundary turbulence or correcting problems in boundary coordination that result in violations of privacy (Petronio, 2002).

With so many pieces of personal information being migrated into online systems, users face very important questions about who has access to their information and when. Through patterns of sharing and through system infrastructure, Facebook aggregates staggering amounts of data on its users including tracking geolocation, vacation plans, birthdates and other personally identifiable information, employment history, relationship history, childhood history, and more. While we recognize that Facebook and its partners present a privacy threat as they could improperly disclose personal information, addressing institutional privacy threats is beyond the scope of this paper, as we focus exclusively on self-managed privacy.

As CPM implies, the onus is on Facebook users to manage access to their information. In offline life, individuals navigate privacy boundaries and negotiations nimbly and fluidly. Within Facebook's current design, this is prohibitively complicated. Some research indicates that most users have taken some steps to limit public access to their information on Facebook, effectively neutralizing (their perception of) this 'outsider threat'. Users tend to restrict their content so that the public can't see it, but they don't go much further than that; most posts are still shared with all friends (Johnson, Egelman, & Bellovin, 2012).

The difficulty of mitigating privacy concerns and putting control in the users' hands lies in the fact that privacy is a dynamic process, requiring constant and ongoing renegotiation, and a dialectic process, resulting from our own concerns and experiences as well as those of people with whom we interact

(Palen and Dourish 2003). Again we are reminded of how Ackerman's social technical gap characterizes the tension between the fluid and nuanced nature of social interactions, specifically efforts to manage privacy, and the inflexible structure of SNS platforms. Additionally maintaining privacy means that users must consider who might view their shared content in the future and from what contexts and perspectives.

2.1.4 Invisible, Imagined, & Actual Audiences

As noted earlier, our social behavior changes depending on who is in our audience (Goffman, 1959). If we have access to limited information about who is in our audience, the tendency is to 'imagine' the audience or fill in the knowledge gaps, but "the less an actual audience is visible or known, the more individuals become dependent on their imagination" (Litt, 2012).

When a discrepancy occurs between the imagined and actual audience, an additional challenge presents itself in crafting an appropriate and effective message. This is true in face-to-face conversation as well as online communication. However the issue of an invisible audience has greater repercussions in online communication. The audience for wall posts and comments on Facebook is likely to be much larger and vastly more diverse than in face-to-face communication. In addition, much communication that takes place on Facebook is persistent, meaning it remains documented online, searchable, and retrievable by any number of interested parties. Therefore, any communication missteps can have far reaching consequences, as users who have experienced regret after posting on Facebook will attest (Wang et al., 2011).

The open display of one's social network on Facebook is conducive to connections being made between users who share some minor connection offline but would otherwise not likely meet (boyd & Ellison, 2007). These connections can be characterized as weak ties. Tie strength is a descriptor of the closeness of a relationship, specifically measured by "combination of the amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services which characterize the tie" (Granovetter, 1973).

Interestingly, users report being most concerned with sharing with weak ties who often do not know them well, such as friends-of-friends, co-workers, online-only friends, and other contacts with lower levels of intimacy (Johnson et al., 2012). This is where the question of choosing what to share, which words to use (language choice), under what circumstances, and with whom becomes difficult, as weak ties might often outnumber strong ties among connections on Facebook. We contend that these weak ties represent a large part of the invisible audience. These relationships, which represent peripheral relevance to the user, are more likely to be overlooked when imagining the audience for a post. Indeed, research has indicated that users typically underestimate the size of the audience for their posts, imaging the audience to be roughly 25% of its actual size. Since individuals care about their presentation to weak ties, their hidden nature becomes a true problem. We attempt to address this problem by encouraging the user to think of their offline environments and roles in order to reduce the need to remember individual contacts.

One study showed a major disparity between intended audience and actual audience of a user's photos. The disparity could have many causes but is notable regardless (Liu, Gummadi, Krishnamurthy,

& Mislove, 2011). Some research has indicated that users find it difficult to understand and use privacy controls that are built into Facebook (Sleeper et al., 2013). In addition, concern about how personal information is shared on Facebook is correlated with reduced engagement, less posting, commenting and 'liking' (Johnson et al., 2012). It would seem to be consistent with Facebook's business model to provide more social cues to support greater social translucence in Facebook communication.

To reiterate, compared with offline communication, Facebook communication offers very few cues to the user about the behavior of other users and about the social environment. In face-to-face interactions individuals have access to myriad social cues about the intention and attentiveness of the recipient, others present in social environment and more. These cues create a sense of social translucence that supports 'coherent behavior' and effective social negotiation and coordination for individuals (Erickson & Kellogg, 2000). Greater social translucence means a more accurate understanding of who is in one's audience and the intentions and interests of those in the audience. We think a viable solution to the discussed problems must include cues to provide much greater social translucence.

2.1.5 Implications of Regret

With the many social spheres that collide on Facebook, disclosing too much information to an unintended social sphere can easily occur and leads to regret over using Facebook. Often SNS users feel regret after posting on topics that express strong emotion, are sensitive in nature, or articulate dishonesty or clandestine behavior (Wang et al., 2011). DiMicco & Millen (2007) posit that if Facebook implemented efficient multiple user content management profiles and multi-level access controls, online identities could be better managed. This would help users define their social networks, share appropriate content, and deflect regret.

The open model of Facebook and other SNS contradicts the natural human behavior to keep social spheres separate. Facebook features such as photo and wall postings can become a source of tension due to multiple social spheres viewing and creating their own interpretation of the data. Users may not proactively seek to expand their network in an attempt to prevent the manifestation of tension between social spheres (Binder et al. 2009). This behavior in response to Facebook's shortcomings could be detrimental to the user as researchers have argued that SNSs can facilitate social capital benefits by helping to maintain, engage, and mine resources from a large social network (Donath, 2007; Ellison, Vitak, Gray, Lampe, & Brooks, In press; Lampe, Vitak, Gray, & Ellison, 2012).

In addition to tension from conflicting social spheres, SNS users can develop feelings of stress and anxiety due to the lack of flexibility and control offered by Facebook. To circumvent these feelings, users engage in deliberate behaviors such as filtering, ignoring, blocking, withdrawal, aggression, compliance and compromise (Wisniewski et al., 2012). The lack of control also prompts users to actively self-censor their content (Sleeper et al., 2013). These findings reinforce that Facebook does not currently have an infrastructure that supports a user's need to moderate diverse networks.

2.1.6 Current Design Research & Potential Opportunities

Among empirical SNS research, some authors have proposed new features and concepts to attempt to address problems in this domain. We provide a brief survey of some past solutions, especially those that have inspired our own design proposal.

Indeed it is possible for Facebook users to control who can view their personal data from a global to a granular level. For example, with the current Facebook privacy settings, individuals can manage the viewing privileges to the data you share on a post-by-post basis, or you can create a 'Friend List' and designate viewing privileges based on the 'Friends' that constitute the list. Despite the seemingly simple policies, it is well documented that Facebook privacy settings are confusing and difficult to navigate (Paul, Stopczynsky, Puscher, Volkamer, & Strufe, 2012).

Building on the theoretical framework of Goffman, boyd and Petronio among others human computer interaction researchers and practitioners have investigated whether users can more adequately represent their preferences for privacy with improved user interfaces. Some previous work has investigated how to develop a user interface that fosters a social networking environment that facilitates users actual communication objectives/needs, and a few examples that helped inform our design are explored below.

In a 2011 study, Kelley and colleagues found that only 17% of Facebook users were employing Friend Lists for controlling privacy. They tested various new mechanisms for organizing friends and found varying levels of effectiveness. They also found that the design of the mechanism afforded either categorization of friends one by one or by the creation of groups first, followed by their population. These findings are worthwhile because it shows the importance of the site's features and user interface in effecting productive interaction.

One way to help mitigate problems of sending regrettable posts on SNSs is to develop an automated system or a visual aide that prompts users to take more care in considering context and the content of their posts. Drawing from behavioral decision research, Wang et al. (2013) implemented 'nudging' prompts into Facebook posts as a form of paternalism to help people overcome reasoning or behavioral biases in decision-making. A nudge is anything that influences an individual's choice (Thayer & Sunstein, 2008). Users became more mindful of their audience with the introduction of the 'picture nudge' which displayed randomly selected profile pictures from the group of people who had the potential to view the post near the 'Status Update' text box. Additionally, a mechanism that introduced a brief time delay before a post could be sent prompted users to re-evaluate whether or not they wanted to send their posts. The picture nudge seems to be a feasible feature that could be incorporated into the Facebook interface without disrupting the user's experience.

Paul and colleagues developed and conducted usability testing on a new user interface specifically for the privacy settings dubbed Colors for Privacy Settings or C4PS. The C4PS interface applied color-coding for different groups, provided straightforward access to the privacy settings, and implemented principles of common practices like little effort, applying common practices, etc. Their concept reduced the number of clicks, and a majority of the usability participants found the design to be much better than the current Facebook interface (Paul et al., 2012).

SNSs arrive, change, and disappear at astounding rates, and SNS research is constantly having to react to new features, models, and behaviors. Despite the ever-changing SNS landscape, the antecedent research provides a strong framework and suffices for the purposes of our paper.

2.2 Our User Research

We conducted user research that further informed our understanding of the problem and informed our design solution.

2.2.1 Survey Development

We created a survey in Google Forms with a goal of gathering information about how people use social networks in general and Facebook specifically. It was distributed via email, LinkedIn, Facebook and Google+.

Based on the literature and theories examined above, the following four open-ended research questions were formulated to developed to guide the design process:

- Are Facebook users concerned about online privacy or context collapse in general? If so, how concerned are they?
- Have they experienced context collapse in their own lives? If so, have there been any consequences (feelings of regret)?
- Are Facebook users utilizing the tools provided by the interface to mitigate their privacy concerns?
- Do Facebook users engage in any self-censoring behavior to mitigate over sharing?
- Are Facebook users aware of the impact of context collapse (anecdotal evidence)?

We gathered 99 responses and our survey participants were predominantly female (n=60). A majority of the respondents were between the ages of 25-34 (35%) and the second largest age group was 18-24 (27%). Overall, 100% of the survey respondents had some college education with 36% completing a bachelor's degree and 55% taking on post-graduate work.

2.2.2 Privacy Concerns

The data indicated that 60% of respondents are concerned about their privacy on Facebook to any degree, and 43% believe that they are not in adequate control of their privacy. Consistent with other studies, nearly half of our respondents (48%) are displeased with the functionality of the privacy settings, and 59% lack confidence in their comprehension of the privacy settings. A mere 12% of survey respondents reported that they use the 'Friends' feature on Facebook. Another major finding to note is that 75% of respondents do not change the audience of their posts. In other words, they are sharing their content with all friends. These points of data are critical to our rationale for addressing the current Facebook user interface.

Based on these statistics, we deduce that users care about their online privacy, but because they perceive functionality and cognitive overload of the settings to be overbearing, they tend to not use the tools provided by the SNS to control access to their information.

2.2.3 Active Profile Surveillance

Our survey results show that Facebook users are becoming more active managers of their personal information with 69% reporting that they “sometimes” untag photos or delete other people’s posts, while 14% report that they “frequently” prune their profiles. Users are increasingly engaging in behaviors such as removing their names from photos that were tagged to identify them, possibly due to Facebook’s automated tagging feature (Madden, 2012). This proactive behavior of users curating their personal data is exemplary of Goffman’s (1959) impression management theory, supporting the idea that individuals care about how they are presenting themselves to their contacts. However, we note that this privacy correction is reactionary rather than active, and therefore requires constant attention.

2.2.4 Consequences of Mismanaged Posts

Our survey found that 33% of respondents have shared a post on Facebook that they have later regretted. One survey respondent said, *“I was happy that I was slaving away at my high ranked school instead of being at CUNY but a good section of my friends go to CUNY and that was insulting and hurtful to them.”* The consequences of posts can sometimes go beyond personal feelings of regret and unintentionally offend or hurt others.

Even worse, some posts can even result in the loss of relationships (Wang et al., 2011). One such instance was presented in our data anecdotally: *“It was election time, and I shared my view, and it continued a negative conversation. I ended up de-friending about 5 people.”*

One can speculate that the posts described in these anecdotal survey responses became regrettable because Facebook is becoming a space where conflicting contexts and social norms coexist, a concept termed “networked publics” by boyd (2008). Perhaps the individual’s doctoral cohort can relate to their Ivy League boasting, but clearly their hometown friends did not appreciate the sentiment. Likewise, in the second example, the user probably had a connections within one of their online networks that agreed with the politically-charged post, but one cannot anticipate how all others will interpret the remark. If these users were able to clearly define who they are posting as and thus share content only to their intended audience, the feelings of regret could be avoided.

3 Proposed Design Solution

In response to the problems we discovered via our literature research and our user survey, we propose a series of features that we believe will lead to a safer and more enriching Facebook experience.

In the following section, we describe and rationalize three key features of the system we have designed. In working to meet the needs of Facebook users, we adopted the role of an internal Facebook team; therefore, our design presumes that such a system would be implemented within the Facebook

platform rather than as an external application.

Note that when capitalization is used in our orthography, we are referring to the names of Facebook features rather than abstract concepts – e.g., “a user’s list of *Friends* may include *friends*, family, co-workers, and other connections.”

3.1 Solution Overview

Under Facebook’s current design, users tend to indiscriminately share with all of their friends at once, despite Facebook’s capabilities for organizing friends into “Friend Lists” (Kelley Brewer, Mayer, Cranor & Sadeh, 2011). However, our research shows both that users rarely consciously want to be sharing with all of their Friends at once and that sharing across contexts can lead to regret. Our solution focuses particularly around a role-based model of Facebook, which is intended to allow users to better represent the different roles or identities that they play in the various contexts of their life.

Our research also leads us to introduce a new method of sorting friends (in this case, a method of connecting friends to a user’s different Roles). Following an investigation into the efficiency and emergent properties of various friend sorting methods (Kelley et al., 2011), we introduce a modified version of card-sorting so that users can tackle an otherwise lengthy and tedious process in a short period of time.

Finally, we describe a series of information-gathering prompts that we are calling “cookie crumb data,” designed to gather small but valuable bits of user privacy preferences, such as to confirm, assign, or modify connections to specific Roles. We believe these prompts will be useful in keeping privacy settings up to date and filling in gaps for users who do not adjust every privacy setting up front.

In the sections that follow, we detail these three key features of our proposed solution:

- Facebook Roles, a **role-based model** for sharing content, viewing friends’ content, and managing privacy;
- a streamlined **friend sorting interface** based on card-sorting exercises; and
- a series of **data gathering prompts** for helping the user complete and maintain their privacy settings (“cookie crumb data”).

For each key feature, we accompany a detailed description with a persona-based sample use scenario or story in order to illustrate the ways in which the feature enhances the experience of using Facebook. We also defend our design decisions by relating each back to our research to show how the feature addresses current problems.

3.1.1 Target Audience

With Facebook’s wide reach and large user base, there are naturally vastly different types of users, each with their own levels of privacy concern, technical skill, and willingness to expend effort managing their Facebook settings. Although meeting the specific needs of all users would be ideal, we have limited our target audience to focus on identifying and solving their specific problems.

Our design solution is targeted toward casual Facebook users who have so far been unable to properly align Facebook's settings with their preferred degree of control. In some cases, this may include users who have accidentally overshared information, leading to regret and self-censorship of future posts (Wang et al., 2011). Our target audience is less technically skilled – they are “digital immigrants” – and are unlikely to have been early adopters of Facebook. Importantly, our target users do care about who sees their content and information, but either find Facebook's model and interface too unintuitive or laborious to use. Such users who don't manage their privacy may encounter mis-matches in their imagined and actual audiences (Litt, 2012), potentially resulting in regrettable posts (Wang et al., 2011). Our design solution attempts to address several of the ways described above in which the current model may be failing these users.

We chose to target this audience because we feel that their balance of technical naïvety and privacy concern results in an unsatisfying user experience; however, an effective solution may be within reach given the right model and user interface. Additionally, they may be more likely to try out a new system if they feel that it meets their needs or if it's more intuitive than a current offering.

Though we recognize the troubling lack of concern that many users exhibit, our design does not target users who are apathetic toward managing their privacy. While our design may be accessible enough that even those without privacy concerns may be interested in adopting it, it is not intended to inspire or motivate users to care more about their privacy. As stated above, it is primarily directed at users who already express concern and a willingness to spend some level of effort in setting up their privacy.

Likewise, we do not target skilled or expert users who already actively and effectively maintain their privacy settings, such as users who already use Facebook's “friend lists” to manage the audience of each post. These users may find the self-centric approach to be interesting and useful, but as these users are already confident in their abilities to manage their privacy, the solution has not been designed with any of their unique needs in mind.

3.1.2 Scenario Overview

In describing the features of our system, we intersperse scenarios of imaginary – yet realistic and grounded by research – interaction with the system. For clarity, scenario passages will be written in *italics* and offset from the rest of the text.

Our scenarios revolve around a fictional forty-year-old woman named Susan Smith, who represents a typical user within the bounds of our target audience. Susan is a working professional and a mom who started using Facebook in the past year after her teenage kids started using the site. Susan uses Facebook to keep in touch with friends from all contexts of her life, from co-workers to family to neighbors to old college friends.

In her offline life, Susan maintains different identities based on her audience (Gottman, 1959; Litt, 2012): in her office, she goes by “Sue,” maintains a professional appearance, and avoids talking about controversial topics like politics and religion; around her family, as “Susie,” she feels comfortable talking about more personal issues, like her health or vacation plans; around her close friends, she's “Suze,” and doesn't mind speaking up about her opinions, beliefs, and other personal topics.

Though she's successfully compartmentalized her offline world, Susan (or Sue, as she's known by her colleagues) got into hot water at work when some of her co-workers saw a political post she shared with all of her Facebook friends. Additionally, as her network has grown and become more diverse, she's felt an increase in underlying tension when she wants to post an update about her life or share an opinion. Since becoming more aware of the implications of accidentally oversharing to her own contacts, she's reduced her usage of Facebook and engages with her contacts via Facebook less frequently. While she made some efforts to set up Facebook "Friend Lists" to separate her contacts, she found that she couldn't figure out a logical schema for establishing her lists. Now, with her posts still being shared with all of her Friends, she has ultimately resigned to self-censoring much of the content she wants to share.

3.2 Role-Based Privacy Model

The central component of our solution is a new ego-centric method of segregating friends and controlling information access, which we are calling Facebook Roles.

As of December 2013, Facebook users' posts are shared by default with all of their Friends, regardless of the Friend's originating context or level of intimacy. As our literature and user research has shown, many Facebook users leave these default setting in place, and some cope with this by using a lowest common denominator strategy, where they try to envision their entire audience and share only what they would be comfortable sharing with every contact (Litt, 2012). Still, many users still overshare. Facebook also includes a feature called "Friend Lists," which are user-constructed groups of Friends. This friend-centric model asks users to have a particular set of friends in mind before creating a list, since their first step will be populating the list. Users can choose which Friend Lists to share with, and can scope their Newsfeed to an individual Friend List. Despite the granularity of its controls, we feel that the Friend List feature is a poor representation of the way users think about their connections and is therefore not the best solution for helping users share appropriately.

Google+, Google's social network, uses a model that is similar to Facebook's Friend Lists. Unlike Facebook's default behavior of leaving new friends unsorted, Google+ requires that users assign their new contact to at least one Circle (analogous to a Friend List). Still, users may face the problem of having to come up with new Circles on their own, without guidance or relation to their offline social contexts, and therefore the problem of unintended disclosures could still emerge through poorly-imagined audiences resulting from the challenges of recalling who is in which Circle (Watson, Besmer & Lipford, 2012).

Figures 1 and 2 show a representation of social networks as All Friends and as separate Friend Lists, respectively.

Rather than maintaining a friend-centric grouping model, we introduce Facebook Roles as a user-centric method for representing social contexts in a traditionally-contextless online environment. Based on our research into self-presentation, we hypothesize that a model that focuses on the user's own roles is a better representation of the way users think about their social networks.

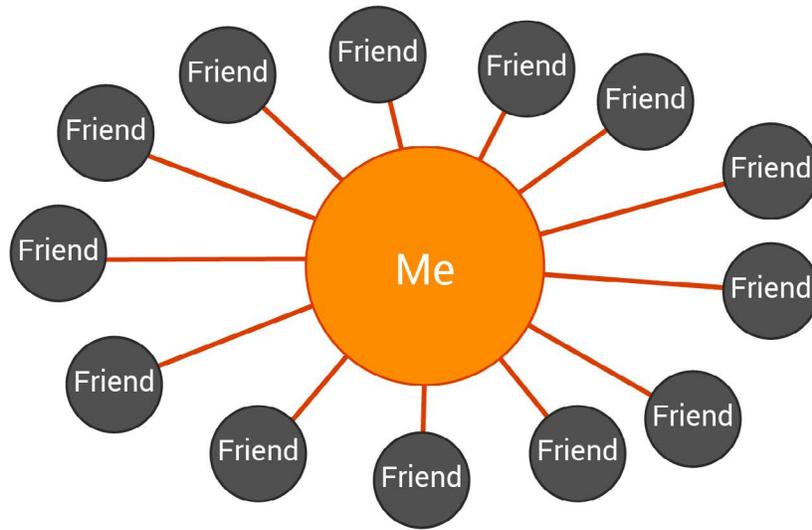


Figure 1 – “All Friends” model

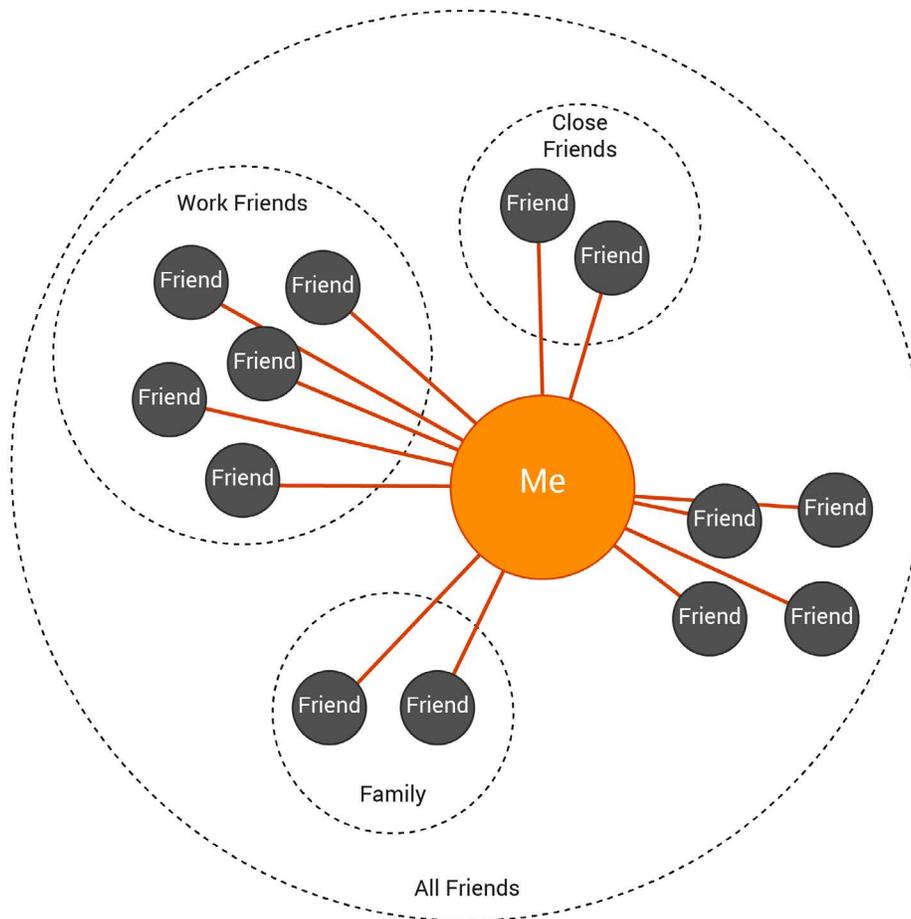


Figure 2 – “Friends List” model

With Facebook Roles, users setup distinct personas based on the roles they play in their daily life. Instead of asking users to try to recognize the different categories of friends to which they present themselves in certain ways, we guide users to recognize their own identities that they portray based on the different social contexts they encounter. For example, individuals may present themselves in one manner while at work, then come home and present themselves in an entirely different (and likely more intimate, honest, and open) manner to their family. We aim to capture these distinctions and extend their utility to the online world in a way that makes sense to our target users.

Figure 3 shows our Role-based model of an individual's social network. Rather than having to imagine their contacts as belonging to discrete groups, the users focus instead on the person they know best: themselves.

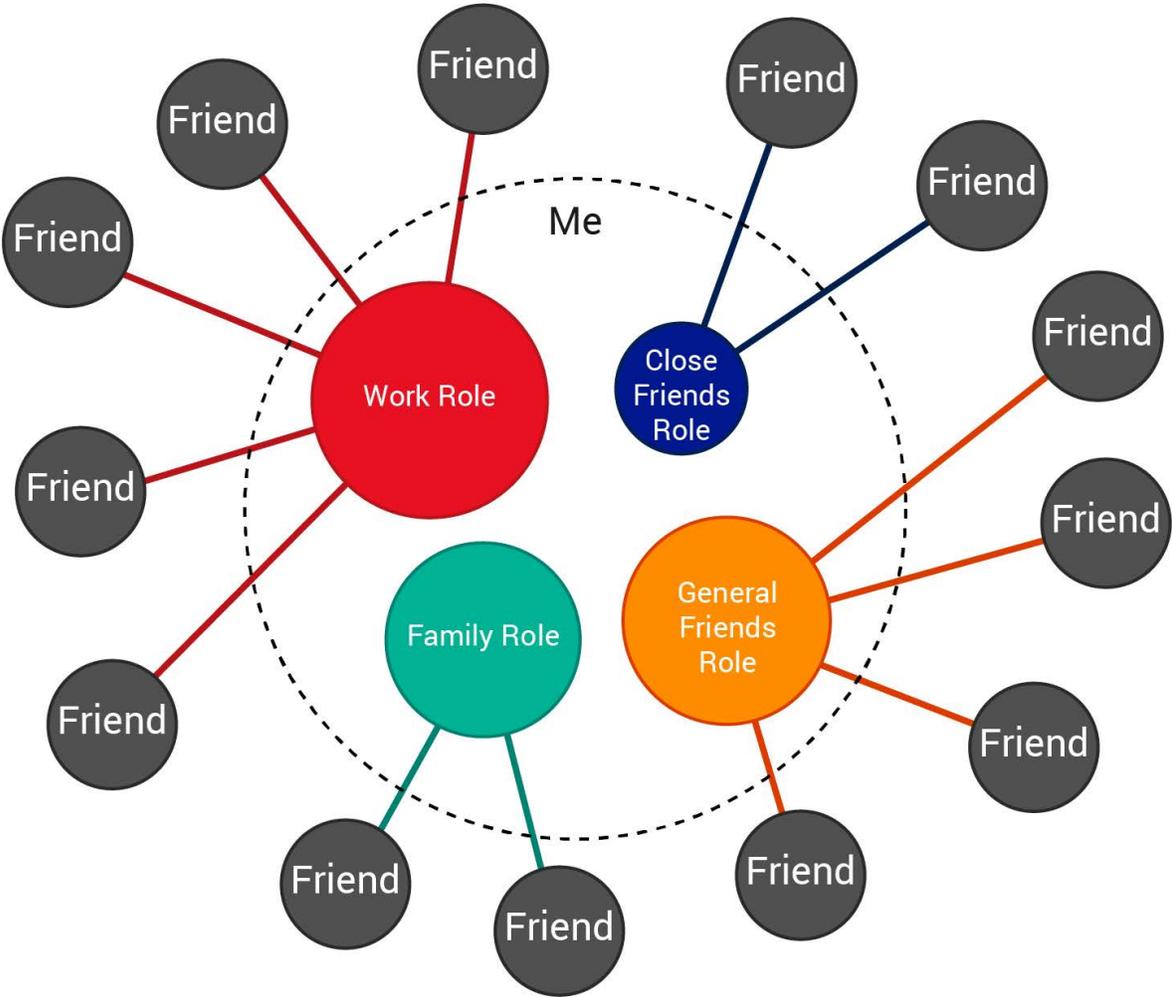


Figure 3 – Facebook Roles, our proposed role-based model

Once a user has identified their own Roles, their Facebook experience becomes divided into discrete contexts, akin to having separate profiles, in order to attempt to help “uncollapse” their social contexts. This is manifested through separate Newsfeeds, profile presentation and access permissions, and sharing experiences.

3.2.1 Setting up Facebook Roles

Users begin their Facebook Roles experience by going through a simple setup process. We recognize through our research that users can be overwhelmed or turned off by complex or lengthy privacy settings (Staddon, Huffaker, Brown, & Sedley, 2012), so we’ve attempted to make the process simple and intuitive in order to increase the likelihood completion.

The setup process begins with a description of Facebook Roles and a relatable rationale to encourage its adoption. Users see their Roles that already implicitly exist in Facebook’s framework – their Friends-only profile and their publicly-accessible profile – with the intent that users might recognize

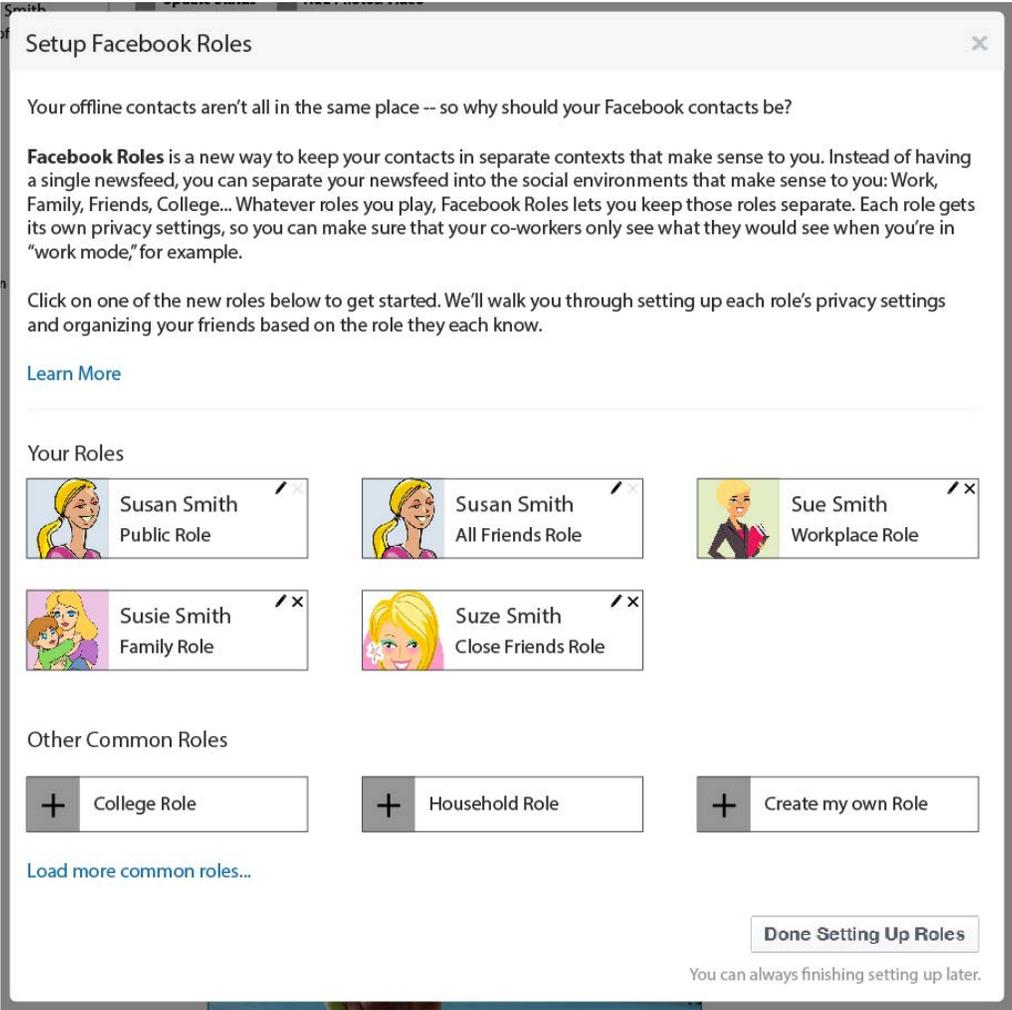


Figure 4 – Facebook Roles, our proposed role-based model

that these represent roles they already play to the people they know and don't know, respectively. The user interface (UI) provides a list of other common, pre-defined roles, such as the Workplace Role, Family Role, Close Friends Role, and Household Role, displayed to inspire users to think more about the roles they already play in their offline life. Figure 4 shows a sample of the Roles setup prompt, with some Roles already populated.

Upon selecting one of the suggested Roles (or creating their own), the user is presented with a short, 2-step flow for configuring that Role. On the first page (Figure 5), the user may:

- change the title of the Role for their own reference;
- edit their display name for the Role (in case they go by nicknames in different contexts);
- set a separate profile photo, as many users express concerns about impression management issues due to being seen in certain photos (Besmer & Lipford, 2009) ; and
- choose a background to associate with that Role's Newsfeed (described in detail later).

We believe that the ability to set a custom display name and photo will let users better represent their distinct roles. For example, a quick glance at LinkedIn profiles, a professionally oriented SNS, will reveal the increased prevalence of work-appropriate profile photos when compared to Facebook, suggesting that users are interested in presenting themselves in a particular way depending on their expected audience.

Our sample user Susan initiates the configuration of her Workplace Role, a role she plays in her office and around her colleagues, where she goes by “Sue.” Her default Facebook profile photo shows her out at a bar with some of her close friends, and while there’s nothing too controversial about her photo, she opts to upload a separate photo from a company photo-shoot in order to maintain a professional appearance.

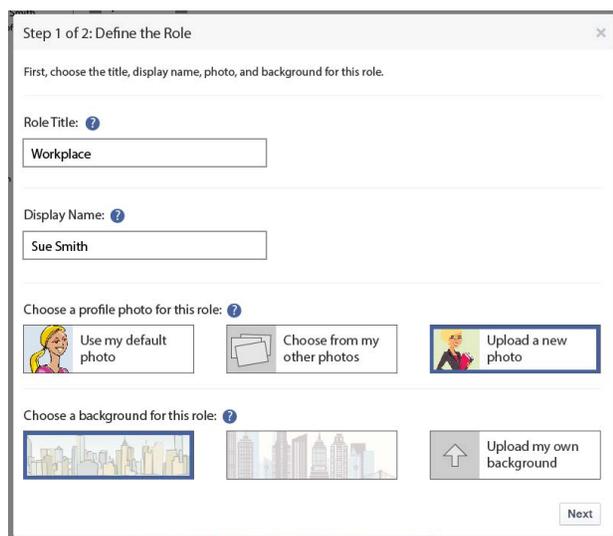


Figure 5 – Step 1, Role definition

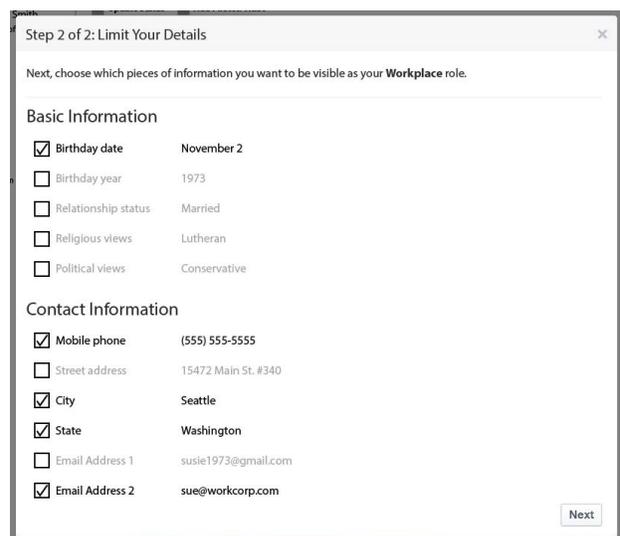


Figure 6 – Step 2, Personal detail limits

The second page of the Role configuration flow (Figure 6) displays the user's existing profile information, such as their location, relationships, contact information, and politics. The user may toggle each data point as visible or hidden within that Role; just as a user may suppress their discussion of politics when in their workplace, they may opt to hide their political and religious beliefs when utilizing their Workplace Role on Facebook. Additionally, if a user has chosen a suggested Role, the UI provides pre-determined recommendations for which data points should be hidden. While a future design may have the ability to provide different data point values per Role, the disclosure is currently binary to keep the process simple.

Facebook's current privacy settings require a data-centric approach, where users see all of their profile data and have to mentally construct an appropriate audience for each piece of data. Our proposal reverses this approach via a role-centric model, where users decide what information they are willing to reveal as each role. We believe this distinction is more in-line with the way people present themselves in the offline world (e.g. by being able to think of the context) and would therefore be a more comprehensible model for many users.

Susan notices that much of the information she wanted to hide from her work colleagues has already been hidden by default when she gets to step 2 of the Facebook Roles configuration flow, which she appreciates. She notices that her personal email address is still visible, so she toggles it off and replaces it with her work email address, which she doesn't mind her co-workers seeing.

After completing step 2, the user can return and configure additional Roles as necessary.

To qualify our design, we recognize that a user's own real-world presentations are more complex than can possibly be captured in a simple design. However, we believe our design is a step in the right direction and a deterrent of users' current behavior of sharing with all Friends at once.

3.2.2 Role Newsfeed

After the user has setup the Facebook Roles that they feel represent their offline roles (and after they have assigned friends to each Role, a process described later in the paper), the user can view the Newsfeed scoped only to that Role. Instead of displaying all of the user's Friends at once, collapsing contexts into one single view, their offline contexts are more accurately preserved by remaining discrete in the Facebook UI. In the offline world, this focused Newsfeed is analogous to being in the environment that that Role would be in. For example, choosing one's Family Role might be thought of as socializing at a family reunion or holiday gathering, while choosing one's Workplace Role might be thought of as socializing in a break room or lounge at work – the user would be presenting and receiving information based exclusively on the distinct role they were playing at the time. With Facebook Roles, the user selects a single Role that they want to display at a time via a visual dropdown UI element.

On a single Role's Newsfeed (Figure 7), the user sees only the content from the contacts who are connected with that specific Role, which we hope will better map to the types of conversations the user might have or overhear when they're in that role in their offline environments.

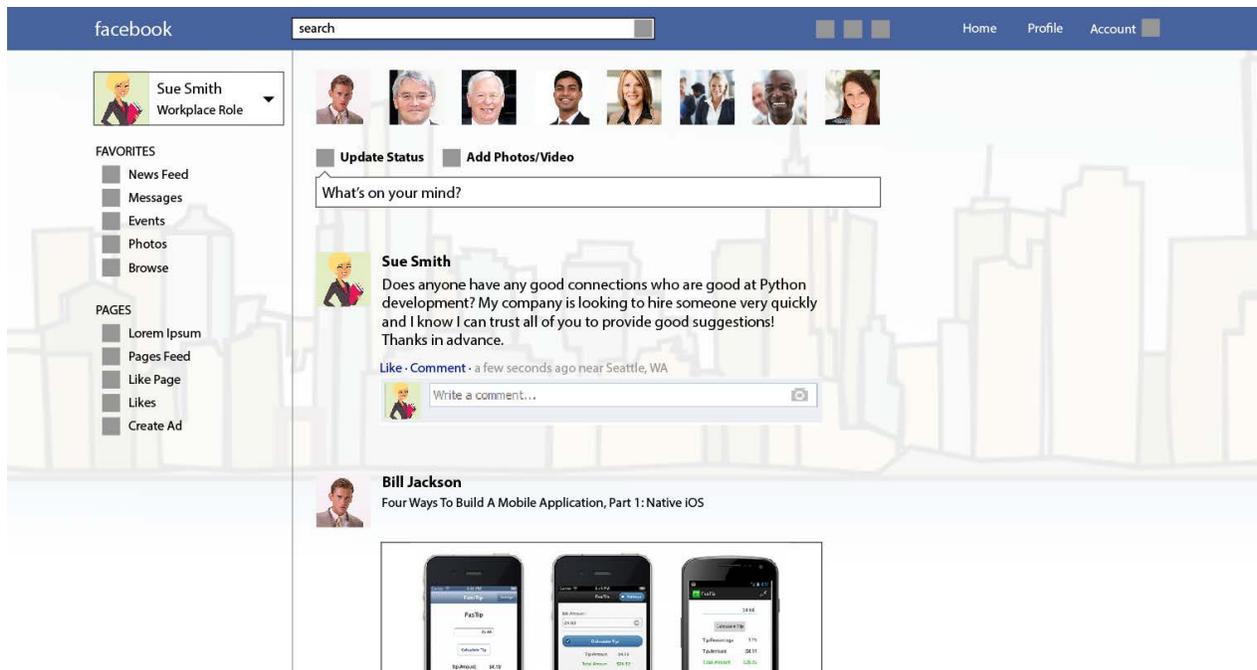


Figure 7 – Susan’s Workplace Role, as “Sue”

The Role Newsfeed is specifically designed with the problem of the imagined audience (Litt, 2012) in mind. Facebook users, especially those with many contacts, may underestimate the size and constitution of their network (Johnson, et al., 2012; Liu et al., 2011). We aim to help solve this problem by attempting to provide visual cues to remind the user of the role they are playing. This solution is in part inspired by Litt’s identification of SNS features and social norms of particular social contexts (e.g. behaving more professionally when in the presence of someone higher in your social structure) as key influences in one’s imagined audience (Litt, 2012). We redundantly provide the following cues to attempt to align the user’s imagined audience as closely as possible with their real audience:

- the user’s Role-specific profile photo, to remind them of the offline role they are playing;
- a user-chosen visual illustration reminiscent of an analogous offline environment, to perhaps mentally “transport” the user to that environment (e.g. a cityscape for a user’s Workplace Role) so that they can better assume the appropriate role; and
- a randomized set of connections’ profile photos, to remind the user of the contacts connected to their Role.

When the user initiates a new post from a Role’s Newsfeed, the content is automatically set to be shared as that specific Role, communicated to the user via the UI cues and a specific label. This viewing and sharing interaction might be analogous to an individual hearing stories while at their workplace, then choosing to share their own story out loud – the other individuals who are present because of the role the user is playing will be the same ones to whom the new story is broadcast.

Dourish (2006) defines a “place” as a setting with emergent and recognized social meaning. In filtering the Newsfeed to a single Role, the Newsfeed no longer contains collapsed contexts and may begin to more closely resemble this definition of a “place” in the sense that its boundaries may be more clearly recognized than that of an All-Friends Newsfeed. These clearer boundaries may better orient the user to the social norms of the environment, allowing them to more effectively decide how they want to present themselves, in part because of smaller imagined audience. If the user is able to think of their Newsfeeds as a “place,” they more be more likely to share appropriately, as they would in a co-located, offline place.

After Susan has set up her Roles and assigned her contacts to them (see next section), she is returned to her Workplace Role Newsfeed. It resembles the Newsfeed she’s used to, but she notices that it shows the professional photo she’d chosen for her Workplace Role. She also notices the profiles photos of her colleagues along the top of the page, and a faint background of a downtown scene. As she looks at the page, it’s clear to her that she’s looking at the Newsfeed specifically for her work contacts.

She wants to post a request for leads for a new employee, so she begins typing a post and is pleased to see that the post will be shared only with those who know her as her professional self – as “Susie.”

Overall, we believe that this Role-based approach is an improvement for two primary reasons:

First, the role-based approach complements the theory that individuals manage their impressions via context-based performances (Goffman, 1959). In a traditional Facebook account, an individual’s offline contexts are effectively discarded, and the user may be less able to use their offline performance rules to guide their online performance. By providing a tool to mirror one’s familiar roles online, we hope to re-establish performance cues so that the user can better represent themselves in less-familiar territory.

Second, the affordances that the role-based approach provides (i.e., the Role-specific cues that remind a user of their context) may prevent mistakes in correctly imagining one’s actual audience. In doing so, we hope to improve user confidence to spur social engagement (Staddon et al., 2012) and prevent accidental oversharing that users may come to regret (Wang et al., 2011; Litt, 2012).

Ultimately, while Facebook’s own Friend Lists may theoretically be able to be used in the same manner, we believe that this self-centric approach is more relatable for users and more likely to be adopted for use.

3.3 Card-Sorting Method for Organizing Friends

As discussed above, Facebook currently uses friend-centric “Friend Lists” for managing the sharing of content and information with different friends. The current interface for creating a new list (Figure 8) is very minimal, including a field for naming the list and an auto-complete text field for adding friends to the list. With a blank field for entering friends, users may struggle to identify all the friends that belong on a given list. This user-driven approach may be difficult for individuals to use effectively, as there is nothing to guide them in their sorting efforts. Consequentially, users may be turned off by the

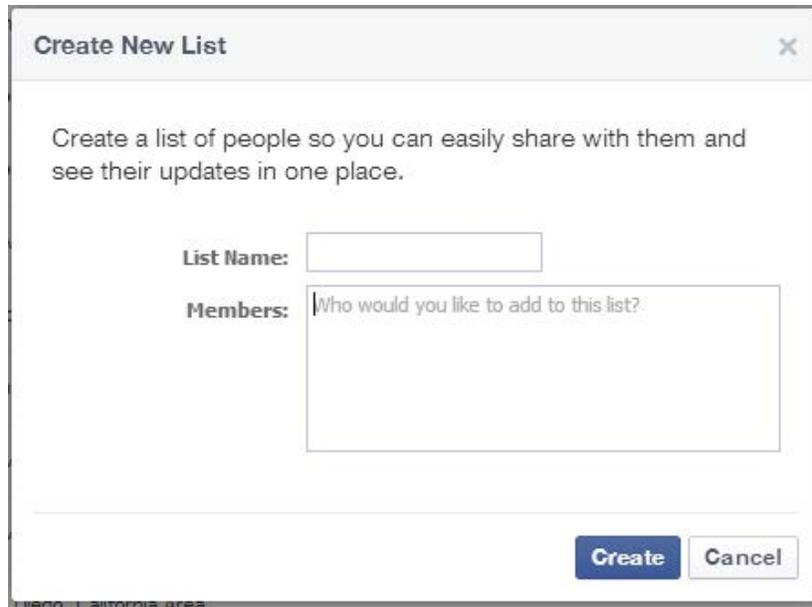


Figure 8 – Facebook’s current UI for creating a new Friend List

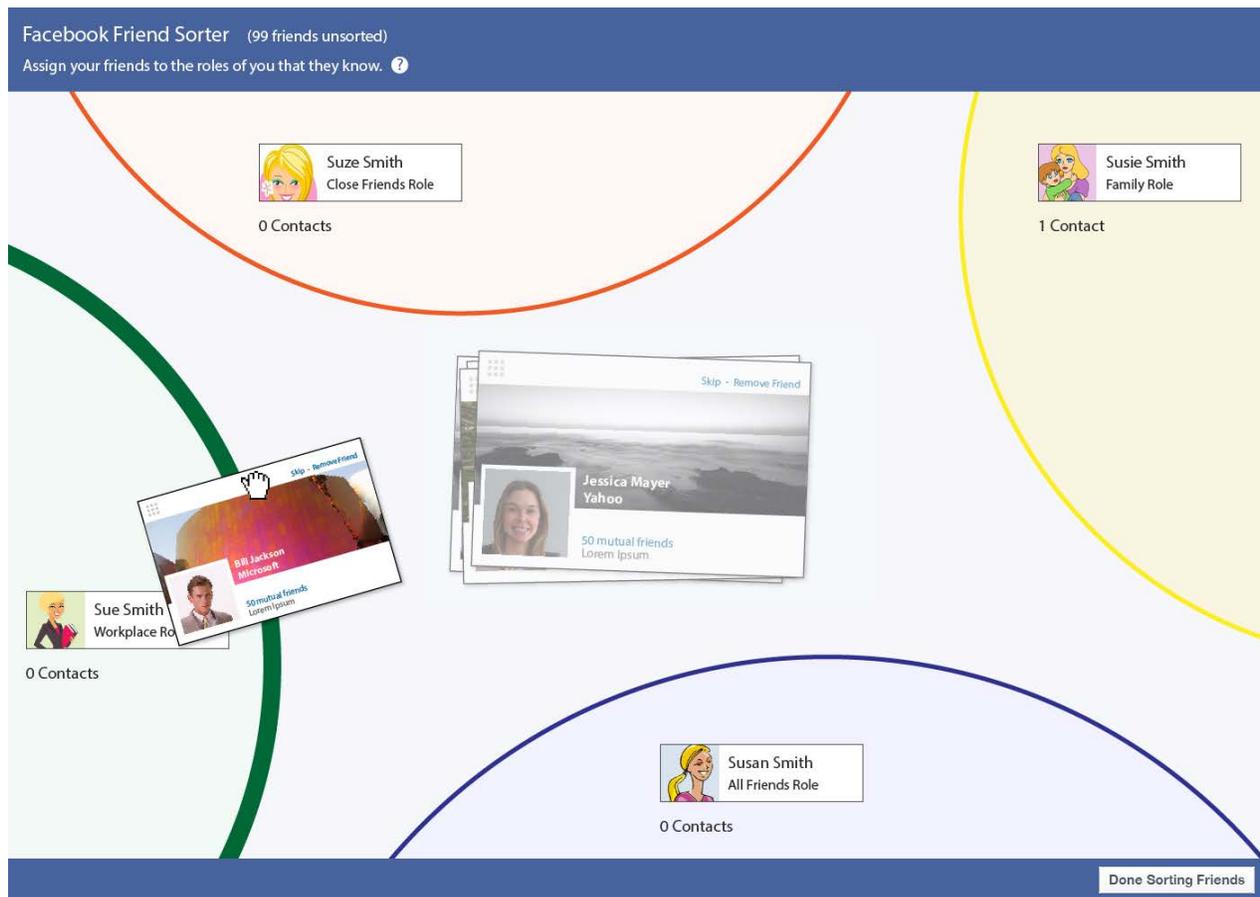


Figure 9 – Facebook Friend Sorter, based on card-sorting exercises

effort of having to manually go through this process and bear its associated cognitive load, ultimately leaving the process early and potentially never completing it. Indeed, research has found that users of Facebook's existing Friend-sorting mechanism may leave many Friends unsorted, potentially owing to the fact that the interface makes it difficult to confirm that all friends have been sorted (Kelley et al., 2011).

Complementing our role-based model of connection and data management, we propose a card-sorting method for assigning contacts to the Roles that they are connected to in the offline world. In our interface (Figure 9), hereafter "Facebook Friend Sorter," users see a digital tabletop with placemats for each of their configured Roles. In the center of the interface, a stack of digital cards represents the user's Facebook connections in a manner similar to the preview cards that one currently sees when they hover over a contact's name.

To sort their friends, a user initiates Facebook Friend Sorter and uses a mouse or touchscreen to drag the top card to the Role that the contact knows in the offline world. Upon release, a confirmation appears to reinforce the connection and allow the user to reverse their action. Just like a physical stack of cards, the next card comes into view and is ready for sorting.

Susan starts Facebook Friend Sorter immediately after setting up her Facebook Roles. Susan sees the Roles that she created arranged around the page, and a stack of cards in the middle, which she infers represents her 100 Facebook Friends.

Susan begins by dragging her first contact to her Family Role, then sees a confirmation message explaining that the contact has been connected specifically to her Family Role. Her next contact is someone that should really only see her professional self, so she assigns him to the Workplace Role.

She continues through the stack of cards, finishing the assignment of 75 of her 100 contacts in just a little over three minutes, before she realizes that she has something she needs to do offline. She clicks "Done Sorting Friends" to take a break and is returned to her Newsfeed, filtered to one of her new Roles.

While we certainly recognize that configuring privacy settings can be a daunting and tedious task, we have aimed to simplify the process to make it as painless as possible. Our model is inspired by a comparative study by Kelley et al., who found a card-sorting method to be the fastest of four methods for sorting Facebook Friends, at just 2.52 seconds per friend (Kelley et al., 2011).

We believe that our Facebook Friend Sorter proposal is superior to the existing interface for several reasons. As a faster method, it may have a higher completion rate, both because users may perceive the process as less tedious due to its speed and because the actual completion time is indeed shorter. Instead of giving users a blank canvas and instructing them to manually select the Friends they want to sort, our solution provides a single card so that the user's mental task is focused only on sorting that one Friend. Finally, we hypothesize that the interactive nature of the card-sorting activity may be engaging and fun to users, who may in turn be more willing to continue through the process.

3.4 3. Information Gathering

In addition to card-sorting method for organizing friends, we propose augmenting the initial privacy setup process with a series of simple user prompts (Figures 10 & 11), shown during user's primary task flow, that require minimal effort and can help keep privacy settings up to date. The prompt is occasionally and randomly shown after sharing content or a status update, after viewing a friend's profile, or after sending a message to a friend. The prompts allow individuals to reaffirming preferences provided in the past and fill in missing privacy preferences on a piece-by-piece basis, such as confirming the Role a friend is already connected to, associating an unassigned Friend to a Role, or confirming that the right personal information is shared as a particular Role. We call this concept "cookie crumb data;" like cookie crumbs, the pieces of data are small but "tasty" (valuable).

For example, after a user shares a message with a friend, the user may be asked which Role to present to the friend or, if the friend has already been associated with a Role, to confirm that it is the correct Role. Additional samples are illustrated in the scenario below. This lightweight method enables collecting and verifying "crumbs" of privacy preferences as part of a user's normal interactions, without requiring them to consciously switch to a separate privacy-setting activity. To avoid annoying or frustrating the user, the prompt would not appear with every interaction, its frequency dependent upon the amount of information that needs to be updated or filled in. Additionally, some of the prompts would be inline on the page, rather than disrupting the user's task.

The following user scenarios illustrate how privacy settings are updated in context of normal online social interactions.

Susan wants to share a question with her work contacts, so she posts it via her Workplace Role's Newsfeed. Immediately after posting this update, she sees a prompt asking her to assign one of her unassigned contacts to a Role. She chooses a Role, and is pleased to see how quickly she has improved her privacy settings.

Susan views the profile of Maria, an old friend, and she sees a prompt that recommends she associate Maria with one of her Roles, as Maria doesn't have an associated role yet. Susie quickly selects her Hometown Role, the one she's created for presenting herself to her friends back at home, and she's confident that she will be sharing the right level of information with Maria.

Susan is frustrated by something a family relative said, and confides with her close friends. She updates her status as her Close Friends Role, and after posting the update, she sees a prompt to confirm that she wants to continue sharing her home address in her Close Friends role. She's assured her friends have access to the right level of information.

Susan later comments as her Workplace Role on a coworker's Facebook status update about completing a project at work. After she adds her comment, she sees a prompt to confirm that Robin should continue to see only her Workplace Role – that is, that it's still the correct Role. Robin is Susan's supervisor, so seeing the prompt reassures Susan that she's sharing to the appropriate audience.

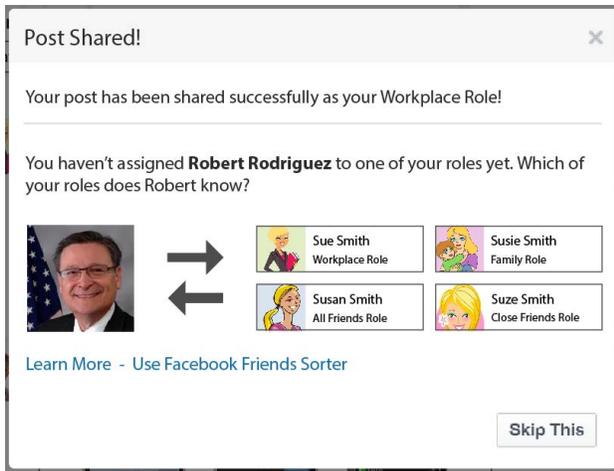


Figure 10 – A sample “cookie crumb data” prompt after sharing a new post.

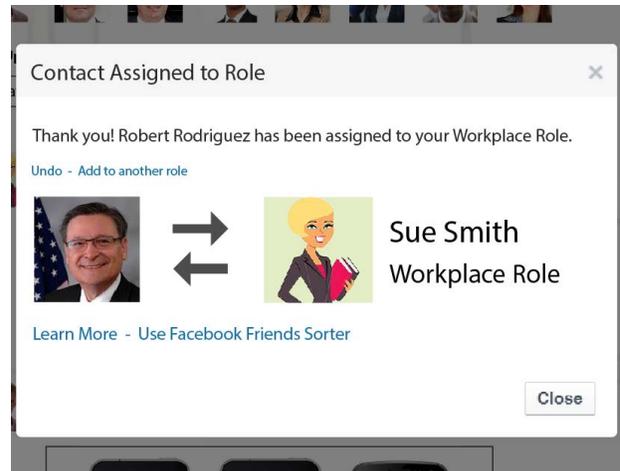


Figure 11 – Confirmation of collected privacy setting data

Even though Facebook provides existing tools for limiting access, users are limited by their ability to find, understand, and use the tools. Privacy concerns are dynamic and fluid (Ackerman, 2000); configuring privacy settings once is not sufficient as relationships and individual roles naturally change. Individual behaviors change based on who is in the audience. Depending on the audience, communication can be characterized by different tones, function, or style (Goffman, 1959). Facebook users report being concerned with sharing with weak ties, or those contacts with which they have lower levels of intimacy (Johnson et al., 2012). Privacy attitudes of online social networking users often don't match actual usage behavior (King et al., 2011); despite the clear indications that many people do indeed care about their privacy, there is equally clear evidence that few users take advantage of the current features to address their concerns. Research suggests that this discrepancy is in part caused by the tedious or confusing nature of today's privacy settings. Our proposed prompts provide opportunities for users to improve their privacy settings and refine their audiences on an ongoing basis in the context of normal online social interactions, helping to keep dynamic privacy needs accurately represented online.

With up-to-date privacy settings, the risk that a user's imagined audience does not match their actual audience is reduced. Additionally, users who did not finish setting up their privacy settings will have a higher likelihood of finishing the process. In conjunction with Facebook Roles and the improvements in Friend sorting, we hypothesize that our proposal to collect these “crumbs” of privacy preferences in the context of common Facebook tasks will increase Facebook engagement and activity as users share more content that they may otherwise have withheld.

4 Discussion and Conclusion

“Life is a constant performance.” Individuals interact and adapt their behavior based on who is in the actual audience (Litt, 2012). They adapt their behavior to present an idealized version of themselves, motivated by aspirations to move to a higher social strata (Goffman, 1959). Facebook users have

difficulty appropriately tailoring their “performance” to their audience, as their imagined audience often doesn’t match the actual audience. Prior research indicates that users typically underestimate the size of the audience for their posts, imaging the audience to be roughly 25% of its actual size (Johnson et al., 2012). Default privacy settings favor openness, and users find it difficult to understand and use privacy controls (Sleeper et al., 2013), creating challenges for users to accurately imagine their audience.

Our solution addresses these issues by introducing a role-based privacy model that enables individuals to “perform” pre-defined roles independent of who’s in the audience. We created a simple card-sorting mechanism to enable individuals to quickly associate friends with specific roles, as we recognize that the configuration needs to be as fast and simple as possible. We also created a mechanism for updating and refining “crumbs” of privacy settings during normal Facebook usage. Together, we predict this set of solutions enables individuals to interact on social networks in a more natural way that avoids the current problems of context collapse.

Our next step will be to continue iterating on the design and create a functional, interactive prototype. Additional work, such as supporting associations of a Friend with multiple Roles, would make the solution more robust. Through conducting user surveys and concept testing, we want to understand which roles are the most common and what types of personal information (*e.g.* birthdate, marital status, political views) users expect to disclose as each Role. Testing will also help answer remaining open questions, such as the effectiveness of using card-sorting technique to associate friends with roles. Through user studies observations, we will gain a better understanding of user’s cognitive load setting up roles and associating friends with roles, ultimately revising the design based on observed behavior.

With a prototype completed, we plan to conduct additional user studies to validate that users understand the concept of Roles, associate their friends to Roles through card-sorting, use different Roles to restrict audience of content shared, and update privacy settings piecemeal in context of normal interactions. We hope that user studies will affirm our design improves a user’s confidence in how information shared is disclosed to friends, reduces instances of regret after sharing, and reduces instances of self-censorship to broadest audiences. Concern about how personal information is shared on Facebook is correlated with reduced engagement, so we expect the changes we proposed results in higher overall engagement metrics, such as number of logins and amount of content users post (Johnson et al., 2012).

There are inevitably several limitations to our study and proposal. Our user survey was based on a small sample, and cannot be broadly generalized. Our design proposal presumes changes would be made within the Facebook platform rather than as an external application, so its implementation for testing is more difficult to achieve. We also recognize that there may be concerns about the degree to which the design aligns with Facebook’s business goals. A reduction in the amount of content shared publically may have a material impact in short term on advertising revenue and business growth (Jose Van Djick, 2013). However, we hypothesize that the increased confidence in privacy controls and the resulting increased engagement is more favorable for Facebook’s long-term business goals and would likely offset any short-term losses; individuals who customize privacy settings are likely to share almost three times as much content than an individual who do not (Stutzman, 2011).

Our proposed solution is designed for users who are concerned about their privacy online, but aren't comfortable enough with the current technical affordances to utilize them. We did not aim to address the needs of the minority of the population that isn't aware of the risks of disclosing information on social networks and share publicly, or those users who are simply apathetic.

Our research and design proposal present a novel approach for easier to use privacy settings that mimic the natural differences in interactions between different audiences. Based on an in-depth literature review, we identified theories for characterizing online interactions on Facebook and other SNSs. Our user survey confirmed users were displeased with the functionality of Facebook privacy settings and lacked confidence in their comprehension. We designed a solution to address these issues, utilizing ego-centric Roles that enable users to easily separate contexts online and filter their communication. The Role structure segregates naturally separate parts of the user's life, minimizing the gap between imagined and actual audiences. Users can customize what personal information and content is shared as each Role, just as they would filter their communication in playing offline roles. We introduce a new Friend sorting method to ease the process of controlling privacy in hopes that users are more willing to complete the process. Finally, users have ongoing, lightweight opportunities to update their privacy settings and relationships during normal interactions through "cookie crumb data" gathering prompts. We hope these design proposals benefit users, providing them more confidence in controlling how information is shared, leading to increased and more confident engagement.

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