Designing for Trust

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ABSTRACT

Donating to a charity or cause a consumer cares about often involves direct transactions to the organization itself. However, an increasing number of for-profit companies now implement donation contributions as a part of their marketing budget. This budget becomes a portion of their operating expenses and consumers, in turn, support these business in order for the business to donate the money to the cause of their choosing. Proseeds is one of the few companies that implements this business model by allowing the consumer to sign-up on their website, choose the causes they care about, and shop at places that will donate a percentage of their transaction for them. This is done without charging an extra penny to the consumer. As an early-stage startup, Proseeds has seen issues with potential consumers lacking trust in their business. This may be a factor that limits the number of people that are signing up for the service. Our team will focus on how the signup process and marketing influences a potential consumer's trust level with Proseeds. Our work will look at relevant trust literature to study the links between design, marketing and trust, in order to deliver recommendations and prototypes for the landing page that results in increased perceptions of trust.

INTRODUCTION

Problem Statement

Proseeds is an online platform that allows customers to contribute to charitable causes by linking their credit cards and shopping at partner stores. Proseeds desires to get as many users as possible to sign up for an account with their platform. Proseeds has faced difficulty getting customers to sign up as many site visitors do not sign up for an account. It is also known that many visitors who do begin the signup process do not finish enrollment, which includes linking their credit cards. Getting people to sign up and increasing conversion rate is an essential objective for Proseeds. Once a user has signed up for the platform and selected a recipient charity, there is no additional action required for the service to take effect.

Since there exists the possibility that Proseeds or any other website may use customer information in a nefarious way, trust is an essential aspect to the onboarding process and can be improved in several ways including a more streamlined signup process, changes to the design of the website itself and strategic marketing or brand building before users ever get to the site. The goal for this project is to present improvements to the design of the website and better understand user perceptions of trust as it regards to Proseeds so that it can be increased.

Background Information

Users of the Internet are increasingly wary of making purchases online and providing personal information, especially credit card information. Design and user experience with a web page can influence users' opinions of the site and can either build trust or make users more wary. Conversion rate in an online environment is defined as the number of individuals who have seen an action compared to the number who perform to completion the action that is desired.

Several factors contribute to establishing a website's credibility, impact a user's perception of trust, and ultimately lead to users taking specific actions online. Stylistic elements of websites, including layout, design, and colors, can all impact user perceptions and beliefs regarding a website's credibility. Peer reviews are another way ecommerce websites have attempted to increase conversion rates of online customers.

Perspectives on Trust

Trust has been studied from many perspectives and has be researched across the fields of Psychology, Sociology, Business, and Information Technology. Sociological perspectives of trust has a strong foundation in the work of Luhmann who describes trust as a socially dependent construct, obtained through ongoing interactions between individuals over a period of time in order to establish an understanding of the ability, integrity, and other factors of the trusted party (Luhmann, 1982). Psychologists look to understand trust as a mechanism internal to an individual's mind. Organizational Psychologists view trust as being comprised of a trustor's perception of ability, benevolence, and integrity of a trusted entity (Mayer, Davis, & Schoorman, 1995). Disposition to trust is a personality trait internal to an individual and results from lifelong interaction and experiences. A business perspective of trust incorporates several similar dimensions. When considering the economics of trust, individuals may try to ascertain whether a trusted entity has reason to be dishonest or cheat (Williamson, 1993).

Trust regarding online services and ecommerce has components that align nicely with some of these prior works in trust, there also exists elements that make trust in these situations unique. With regards to Proseeds onboarding, consumers are believed to have little to no experience with the company prior to the onboarding process, therefore opportunities to establish trust are not considered. Trust must then be conveyed in other ways including in the website's design and in the reputation that is built up about Proseeds before the consumer ever visits the main website.

Designing for Trust

Individuals utilize environmental cues to help inform business decisions in the physical world. Without prior knowledge or experience, these environmental factors may be the only information on which to establish trust with regards to a merchant or service provider. Belief that an environment and the interactions occurring within it are in congruence with an individual's expectations is referred to as situational normality (Gefen, Karahanna, & Straub, 2003). In

circumstances when situational normality is perceived as high, trust is built while the opposite occurs if situational normality is perceived to be low. To establish trust in online services, several important design considerations must be implemented when designing websites. First, the design must reflect visual elements and interaction components that are consistent with their expectations and experiences with other websites (Gefen et al., 2003). Second, the design should communicate legitimacy by communicating structural assurances and leverage preexisting affinities toward other trusted businesses or service providers (Gefen et al., 2003). In online environments, this can be done by prominently displaying badges indicating adherence to web standards or communicating a technology follows stringent security guidelines. In addition, links to reputable regulators and certifications can contribute towards communicating the trustworthiness of a website.

Project Objectives

The primary objective will be to assess their landing page, apply several design iterations, and gauge which features most strongly influence trust levels. While Proseeds faces issues with low signup rates, lasting impressions are dependent on the landing page. With this, we strive to develop ways of increasing consumer trust and minimizing those who only partially complete the signup process. In addition, we will conduct user testing of the old landing site.

After users complete the user testing we will have users complete a psychological assessment instrument to capture their perceptions of the website and their degree of trust in Proseeds. We plan to develop new prototypes and have several test subjects use the website and record their perceptions of trust and usability after their interaction with them. We also tested how certain messaging and communication of what Proseeds does and how it works impacts their perception of trust in Proseeds.

RELATED WORK

Historical Trust and Risk

Trust has traditionally been viewed as a phenomenon occurring in a context involving two or more people. From a psychological perspective, trust is viewed as an internal mechanism of the mind [11]. A sociological perspective on trust primarily views the construct in terms of the relationship involving two or more individuals [10]. Historically, both psychological and sociological research have studied trust as it relates to relationships among and between individuals. Husted [6] describes from Mayer et. al [11] that trust is based around making oneself vulnerable to another to achieve a certain result, even if the action cannot be verified. This relationship allows for two participants, a trustor and trustee [6, 11]. The former is the one made vulnerable and the latter is the one trust is placed within. In the case of Proseeds, the customer is the trustor and Proseeds is the trustee; the customer is to make themselves vulnerable to

Proseeds, for example, providing credit card information, and *trusting* that Proseeds will not abuse this vulnerability.

When a customer trusts Proseeds with credit card information, it means the customer is certain that they will not be financially wronged. A more simplified definition is cited by McKnight et al. [12]: A willingness to depend on others. It is described by Husted [6] and Koehn [8], that this description can prove to be limiting, as it leaves out the trustor and trustee relationship dependence. Koehn [8] therefore suggests a new definition, one in which Husted [6] agrees: Trustors expect to continually receive favor from the trustee.

In addition, the process of trust is another dynamic to be considered [6]. Characteristic-based trust is one determined by a characteristic that identifies a reputation of being trustworthy [6]. This is precisely the problem believed to have been identified with Proseeds website. With the design of the landing page, a characteristic that customers are looking for is not being identified. It was noticed by Husted [6] that this also leaves customers more vulnerable to abuse, which may explain apprehension amongst potential users. Another process is institutional-based trust, one built through external validation [6]. In the case of Proseeds, this would be the verifications for financial security from external sources such as TRUSTe. An effort was made to understand the role this played in perceptions of the website. These same principles were adapted by Husted [6] from the works of Mayer et al. [11] and others.

A process for the development of some trust factors Mayer et al. [11] were identified. They suggest that when little information is known, integrity is the dominant factor to trust [11]. Over time, once the relationship develops, knowledge about the benevolence of the trustee grows [11]. This suggests that when potential customers first come to Proseeds, potential customers are evaluating the integrity of Proseeds. Since many of these potential customers are leaving without signing up, this could mean that Proseeds is perceived as reflecting a level of integrity that promotes distrust.

Koehn [8] states several other methods of developing trust. Some of these include: avoidance, disclosure, experiential, office-based, and policy [8]. Avoidance involves avoiding actions that jeopardize reputation [8]. This is simple; Proseeds must be truthful in its statements, particularly the ones first viewed by potential customers. Disclosure is about informed consent [8]. For Proseeds, this would entail being upfront about the way the business operates. Experiential focuses on experience [8]. This area is difficult for startups like Proseeds. The owner, Jared Bakewell, started and owns other businesses. The past successes of these businesses could present Proseeds as more trustworthy.

Mayer et al. [11] focuses more on the impact of risk on trust. They noticed that there is no agreement on how trust relates to risk [11]. Some argue it leads to trust, others that it is trust, and still others that it is an outcome of trust [11]. If someone is intentionally making themselves vulnerable to trust someone, as argued by Husted [6], Mayer et al. [11], and Koehn [8], then, Mayer et al. [11] suggests, they are taking a risk. They therefore argue that trust is not risk, but a willingness to take risks [11]. An argument is also made that the presence of risk is what

separates trust from cooperation [11]. This might suggest that one reason for the identified lack of trust in Proseeds is the risk. Customers might view the website as too risky, thus, avoid giving credit card information and leaving the onboarding process without finishing.

Trust only requires a willingness to take a risk, whereas the actual behavior requires taking the risk [11]. This distinction could be of importance to Proseeds. It is possible that consumers trust Proseeds, but they were unwilling to take the extra step to undergo the actual trusting behavior. The authors also suggest that within this, context plays a significant role [11]. Context is defined as what is at stake, the power balance, the perceived amount of risk, and alternatives [11]. Proseeds is the only business of its kind; the alternatives operate in significantly diverse ways. This leaves what is at stake, the balance of power, and the amount of risk.

Since risk has been determined to play a key role in user trust, it would therefore follow that any perceived risks should be mitigated. Flanagin et al. [1] noticed that online purchases usually lack traditional methods of ensuring trust. Flanagin et al. [1] conducted a study to determine the impacts of risks on credibility. It was concluded that users are impacted more by information obtained from the web [1]. This suggests that users would be more likely to trust Proseeds based on online feedback from real users. The study also suggests that user ratings heavily impact perception of quality and intent to buy [1]. While this may be more impactful for a traditional e-commerce model, where products are rated individually, Proseeds may benefit from citing positive user interactions or by utilizing online reputation systems.

Another area where trust has been investigated is with online reputation systems [13]. These systems gather comments from users in the form of feedback on products and services offered in an online environment. Reputation systems focus on helping to convey information so that individuals can assess the trustworthiness of other individuals. These systems also help to convey information so that individuals can assess the trustworthiness of a service, product, or non-human entity. It is important to note that these assessing trustworthiness is typically cognitive in nature.

In fact, many of the factors previously discussed are cognitive in nature. The research makes no claims about perceptions of trust within behavioral contexts, and so there is a perceived weakness in the literature in this regard. It is our position to better evaluate behavioral reactions. This requires understanding how design influences users' level of trustworthiness toward businesses in online environments.

Design and Trust

Evaluating the trustworthiness of websites is a process that many individuals perform. There are several methods in doing so and the aesthetics of a website is one factor. There is greater awareness in design research in that trust is one component that cannot be overlooked. Proper design effectively communicates proper business information to the user. Website design includes text, pictures, and icons. Williams stated that these elements are much more meaningful

when they are unambiguous and easily apprehended by the user [19]. The ways in which design elements can be unambiguous are subjective. Several studies agree in how users grade the level of trust on websites they visit.

The complexity of the relationship between design and trust is immense because one small element can encompass a full set of research alone. Some examples of these for websites are colors and trust, typography (font) and trust, images and trust, etc. This also means that, even when focusing on one particular design element of Proseeds' website, may increase their consumer's levels of trust. For instance, the use of emblems of third-party security companies and other icons that give structural assurance can improve an individual's perception of trust in an e-commerce website [3]. The link between overall visual design of a website and trust has also been explored. In a study that looked at design elements such as color and graphic imagery, it was found that manipulations of these elements could reliably impact users' perceptions of a website's trustworthiness [7]. An understanding of what kind of imagery should be included on a website to illicit feelings of trust remains an open question to be explored. However, other trust factors can be explored further.

One of the collected sources analyzed several factors that influences a user's perception of website credibility. As defined by Vance, these were system quality (bugs in the system; quality of documentation; maintainability) and website quality (navigation; visual appeal) [17]. Vance and other researchers used these measures to compare against a user's level of ease of use. It was found that trust is directly linked to the system's level of quality. These characteristics include navigation and visual aesthetics. The visual aesthetic elements in this research were regarding layout and graphics. One of the great findings from this research was the degree in which website quality served to be a greater factor over privacy and security features for trust [17]. However, their research may have been inherently biased due to their use of using Amazon.com to measure credibility, which they recognized in their paper. Visual design still plays an incredibly influential role for a user to determine if a website is credible.

Perceived usefulness can be enhanced by also focusing on the content a website conveys, making sure that it addresses customer interests and questions. When considering Proseeds' website, it is important that customers understand what the service provides in a straightforward manner. This could be accomplished by more concisely communicating how Proseeds' works. Having useful content on a website contributes positively to establishing the overall perceptions of trust in a website [14]. Content specifically related to convey understanding of the organization and people behind an online website can also be used to increase perceptions of a website's credibility and trustworthiness. Work in this area has shown that inclusion of photographs of real employees, alongside other information such as physical address and contact information, are most effective in enhancing perceived credibility [2].

Building upon content, it is also important to discuss text, specifically regarding typography. Typography is shown to create initial, lasting impressions on users. In Henderson's research, impression (and emotional responses) was measured against varying typographic

designs presented to users [5]. The design characteristics they used to measure levels of different fonts were broken into universal (used for logos; structural) and specific (hand-written appearance; more organic). On top of that, there were also six design factors: Elaborate, harmony, natural, weight, flourish, and compressed [5]. Combining the design characteristics and factors, the researchers could explain user emotional responses to different typographic responses.

The study found several responses to varying typographic combinations. For example, harmony and natural fonts were linked to feelings of pleasing and reassuring while elaborate fonts were linked to displeasing and unsettling responses [5]. While that study is not relating to trust, their measurements in dissatisfaction, reassuring, etc. relate to feelings of trust to a certain degree. Typography, whether regarding the brand logo or website text information, is merely one design characteristic that has some level of guidelines for effective use.

Text and image design guidelines can be further explored. The most applicable rules are these (not in particular order): 1) Avoid busy or distracting backgrounds, 2) Graphically reveal relative levels of importance among elements or groups of elements in a display, 3) Avoid setting type in all caps, 4) When possible, use conventional (universal) icons [19]. This resource serve as quick guidelines for iterating over prototype mockups as we will be able to compare the original version to how the new versions can be slightly changed to make bigger impacts.

While this source is clearly a reference for design guideline purposes, it still pointed out effective and ineffective design elements. It is also important to note that, while it pertained to design, it did not pertain to trust at all. However, from other collected resources, we have substantial material to hypothesize and test upon these given guidelines.

Gathering all our materials thus far, website quality is a highly influential piece in user trust levels. Wells stated that, just like in physical stores, where they have furnishings and décor, websites have these attributes (visual appeal, navigability, security, etc.) that contribute to the business' product quality [18]. Websites are forefront representations of products and its visual qualities are often assessed in less than one second [18]. For instance, higher website quality has the potential of being connected to higher trust levels.

We may then ask a series of questions: 1) If the website is perceived as trustworthy, how trustworthy is the data (messages) that are communicated to consumers? 2) What signals are being sent to influence perceptions of trust on this business? 3) To what degree is the company communicating in the interest of the potential user? And so forth. To answer these questions, we may acknowledge that the gathered resources have voiced the mere fact that visual appeal is a strong, if not the highest, influencer of trustworthiness. Therefore, we may apply several design iterations to measure levels of trust regarding design.

PRELIMINARY WORK

To determine the changes that Proseeds must make to increase the retention of potential users, it is necessary to study and understand what will allow users to feel most comfortable and trusting of Proseeds. To do this, three steps must be undertaken: interviewing of current and potential users, the development of modified landing page designs, and a usability test to study to assess the effectiveness of these designs.

Preliminary Work Methodology

For this project, we had the following research questions:

> *RQ1: How does design impact perceptions of a website's trustworthiness?*
> *RQ2: How does messaging impact perceptions of a website's trustworthiness?*
> *RQ3: What visual elements do individuals attend to on the current and redesigned versions of the Proseeds website?*
> *RQ4: How are people understanding the concepts Proseeds is trying to communicate with their original design and messaging?*

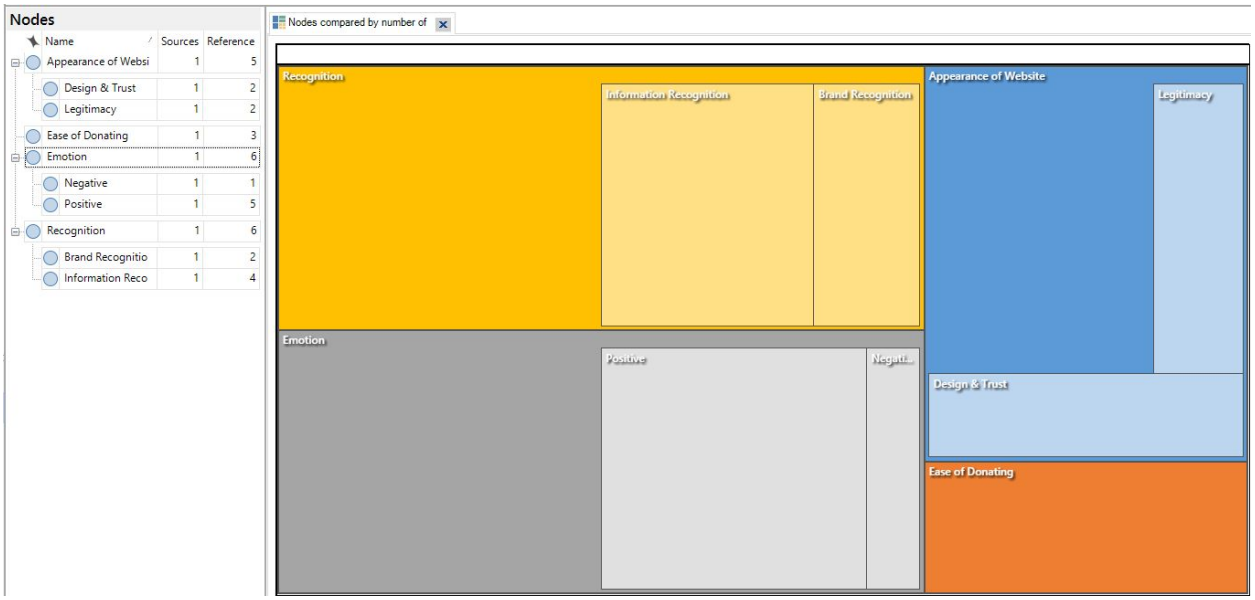
The user interview tried to identify what aspects of the landing page influenced their levels of trust. This was done by asking how they identify trustworthy websites or companies, what makes them comfortable entering credit card information, and how receptive they are to charities. The user survey was based from Gefen and Straub (2004). It was important to establish the priorities of these potential users to understand both what they enjoy and what makes them cautious. In addition, we also considered what aspects of the service are currently trusted by existing users and what drew them into signing up for the service. The interview was transcribed and coded for content analysis using NVivo and the survey was completed by nine potential users.

Preliminary Work Results

Interview Results. We interviewed two potential Proseeds customers in-person. Note that the interviews were held separately. Both individuals regularly donate and shop online. Our focus was to gain insight from them on site trustworthiness. From the two respondents, the information gathered were similar in their ideas on what makes a site trustworthy. The first interviewee stated that they require some degree of legitimacy of the design of the website. The second interviewee stated the same, with the addition of an expression of the company attempting to make their site appear trustworthy.

Neither respondent knew how to explain their meaning of trust, but did allude to their desire for privacy and data protection. With the interviews, we further broke the information

down into nodes using NVivo. There are four parent nodes: 1) Appearance of Website, 2) Ease of Donating, 3) Emotion, and 4) Recognition. Nodes 1, 3, and 4 had child nodes. Node 1 had the child nodes Design & Trust, and Legitimacy. Node 3 had child nodes Negative and Positive. Lastly, Node 4 had the child nodes of Brand Recognition and Information Recognition.



NVivo Content Analysis for In-person Interviews

With the categorization of these nodes, we used a hierarchical graph to represent the degree of importance of our data. This information only includes in-person interviews; however, we have conducted several questionnaires to other potential Proseeds users to supplement our findings.

Survey Results. Our survey was completed by nine participants and was modeled off a survey developed by Gefen and Straub (2004), which measured the role of trust and familiarity in an online e-commerce website. The following questions were asked, and respondents answered on a one to seven Likert scale.

Survey Questions:

A: Promises made by Proseeds are likely to be reliable.
B: I do not doubt the honesty of Proseeds.
C: I expect that Proseeds will keep promises they make.
D: I expect I can count on Proseeds to consider how its actions affect me.
E: I expect that Proseeds intentions are benevolent.
F: I expect that Proseeds puts its users' interests before their own.
G: I expect that Proseeds is well meaning.

H: Proseeds is competent.
I: Proseeds understands the market it works in.
J: Proseeds knows about online giving.
K: Proseeds knows how to provide online security.
L: I am quite certain about what Proseeds will do.
M: I am quite certain what to expect from Proseeds.
N: I am very likely to sign up with Proseeds.
O: I would use my credit card to sign up with Proseeds.
P: I generally trust other people.
Q: I tend to count upon other people.
R: I generally have faith in humanity.
S: I feel that people are generally well meaning.
T: I feel that people are generally trustworthy.
U: I feel people are generally reliable.
V: I am familiar with services like Proseeds.
W: I am familiar with using my credit card on the internet.
X: I am familiar with Proseeds.

Survey Results:

#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
p1	2	2	2	1	1	2	1	2	1	1	2	2	2	2	1	2	1	1	1	2	2	3	1	4
p2	2	3	2	2	2	2	2	3	3	3	3	3	3	4	4	3	3	3	3	3	3	4	2	3
p3	5	4	3	6	3	6	2	2	2	2	2	1	2	5	6	5	6	4	5	5	5	4	1	4
p4	6	6	6	6	6	6	6	4	5	7	7	7	7	7	7	4	4	2	3	3	3	4	1	5
p5	2	1	2	3	1	1	2	3	1	1	4	2	1	1	2	4	3	3	3	4	3	5	2	1
p6	2	4	4	4	2	3	3	4	4	2	4	4	4	6	7	5	6	5	5	5	5	7	4	6
p7	2	2	2	4	4	1	1	1	3	2	2	2	3	4	7	7	5	3	3	3	3	4	1	4
p8	2	2	2	2	2	1	1	1	1	1	3	2	2	2	2	2	6	3	3	3	5	5	1	1
p9	2	3	3	3	3	1	3	4	3	1	4	3	3	5	5	4	3	3	3	4	4	5	1	4

Regarding the likelihood of signing up for Proseeds, 66.66 percent of respondents indicated they were neutral or unlikely to sign-up. Similarly, 66 percent of respondents were neutral or unlikely to associate a credit card with Proseeds, despite 89.7 percent of respondents indicating they had familiarity using a credit card online. There was a wide distribution of responses relating to the various dimensions of trust. This indicates that there is substantial room for improvement.

Preliminary Work Summary of User Needs. Allocating all the data that we have at this point, we may now answer our initial research questions:

RQ1: How does design impact perceptions of a website's trustworthiness?

This was seen to be strongly correlated thus far. The design of the website influenced user perceptions on the company's legitimacy. This supports both works by Vance, Elie-dit-cosaque, and Straub (2008) and by Wells, Valacich, and Hess (2011). Visual impressions have a significant role in user perceptions on the degree in which they can trust. Therefore, design modifications cannot be overlooked in our methodology.

RQ2: How does messaging impact perceptions of a website's trustworthiness?

It was seen from our NVivo data that information recognition played a key role in their perception of Proseeds and of e-commerce platforms in general. Interestingly, the messaging, or the representation of information on a company's website, was more influential than of the user knowing the brand. However, brand recognition still played a role in perceptions of website trustworthiness.

RQ3: What visual elements do individuals attend to on the current and redesigned versions of the Proseeds website?

Since we used NVivo and the user survey from Gen and Straub (2004), we primarily captured the users' perceptions on trust. At this point, we do not have revised versions of the website. However, we have found that, since design and information recognition largely influence trust, we have strong validation to modify both to measure such differences. In addition, we also currently know how people understand the concepts Proseeds attempts to make with their original design.

RQ4: How are people understanding the concepts Proseeds is trying to communicate with their original design and messaging?

While our in-person interviews did not cover specific questions regarding Proseeds' website, we obtained substantial evidence from our user surveys about the company's messages that they attempt to communicate. It was seen that 66 of respondents did not want to associate their credit card information on Proseeds' platform. This means that there is a degree of unclarity with the messages that Proseeds currently uses on their website. Although the user survey did not specifically correlate the respondents' levels of trust with the visual aesthetics of the website, we may infer that there is some influence according to our previous research questions. We then

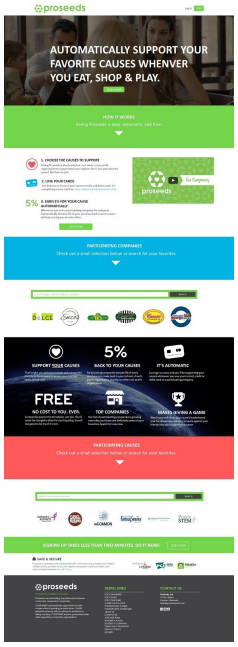
began to develop our prototypes by modifying both the design and messaging to identify specific features that will increase user trust toward Proseeds.

METHOD

We tested 16 users of our prototype using eye tracking. We analyzed the data in two ways. First eye tracking was looked at to investigate where users are looking in order to determine what visual elements of a web page the users are attending to. This data was compared to their survey responses of trust to determine what visual elements are responsible for increases and decreases in trust. Data from the free response was analyzed using a bottom up and top down thematic analysis approach. First, data was read and coded with emergent themes. Next, data was reviewed again looking for key concepts that we determined from literature on interpersonal and organizational trust. These themes for the top down coding could include any time users mentioned concepts relating to benevolence, ability, and trust.

Prototype Development

For this effort we designed four prototypes for user testing. We began with a prototype that was visually identical to the Proseeds website as it looked at the onset of our work. Next, we developed a second prototype that incorporated many of the design elements that were believed to promote trust as well as new messaging. From the preliminary work, we knew that users were uncertain of how Proseeds worked and that this needed to be more clearly communicated in the messaging used in our new designs. We were also aware from interviews with users who had previously viewed the website that they believed the design left room for improvement and many different visual elements could be tweaked and the overall organization of content improved upon.



Proseeds' Original Landing Page

Prototype Testing

An experiment was designed to to better understand how messaging and visual design impacted user trust and their intent to sign up for Proseeds' service. Participants were asked to view two different versions of a webpage and to complete a series of questions following each viewing. Users were exposed to two of four versions of a website in a counterbalanced 2x2 study design. Because different messaging would potentially confuse a user's understanding of the online service, subjects were exposed to different designs while messaging was held constant.

Table 1

2x2 Study Design

	Design 1	**Design 2**
Message 1	M1, D1	M1, D2
Message 2	M1, D1	M2, D2

We recruited 16 individuals from the University of Nebraska at Omaha to participate in our study. The subjects consisted of 15 undergraduate, eight female and seven male, students where their ages ranged from 19 to 22 years. Additionally, one participant was a female university staff member who was 61 years of age.

After consent was obtained from all participants, each individual was seated in front of a dedicated computer terminal and positioned to face a computer monitor with eye-tracking capabilities. At the beginning of each study, all participants were asked to complete a short calibration process (Tobii regular calibration screen) that required them to focus on nine dots positioned with three rows of dots across the top, middle, and bottom of the screen. This process was repeated until the participant acquired an "excellent calibration" (average distance of measured gaze from the target ($\mu(x,y) \leq$ 20 pixels) was achieved. Participants were informed to limit unnecessary eye movement and to avoid touching their face with their hands as this would impact the quality of the eye-tracking data. Participants were then read a short description of the task and were instructed to begin the study.

Participants were exposed to the first stimuli and were able to scroll through a web page loaded within Internet Explorer. After they finished viewing the first stimuli, they manually advanced to the next screen, which asked the users a series of Likert-type questions as pictured below:

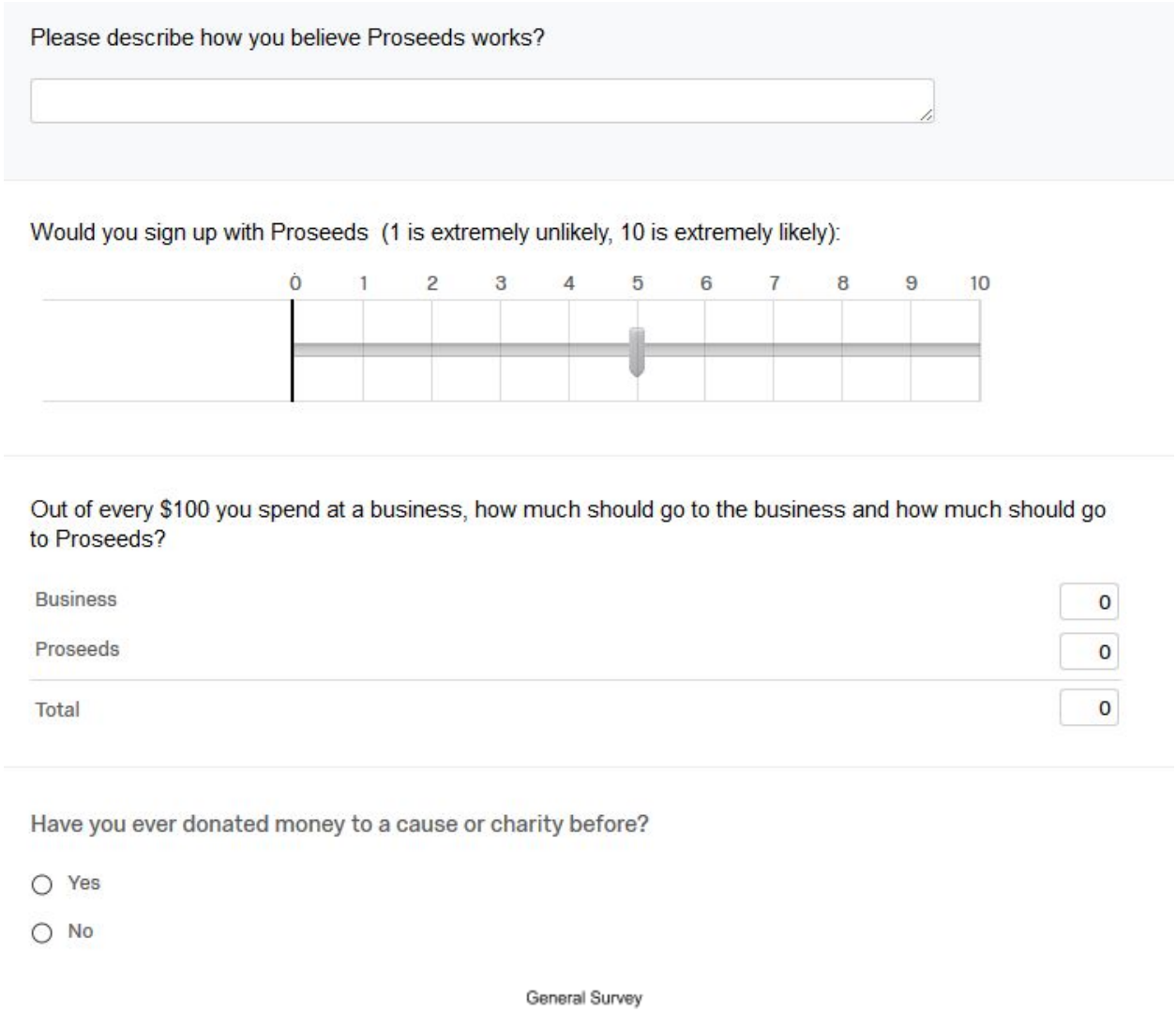
Please indicate a response to the following statements:

	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I do not doubt the honesty of Proseeds.	○	○	○	○	○
I expect Proseeds is well meaning.	○	○	○	○	○
I am very likely to signup with Proseeds.	○	○	○	○	○
I would use my credit card to signup with Proseeds.	○	○	○	○	○
I am quite certain about what Proseeds will do.	○	○	○	○	○
I am quite certain what to expect from Proseeds.	○	○	○	○	○
Promises made by Proseeds are likely to be reliable.	○	○	○	○	○
I expect that Proseeds will keep promises that they make.	○	○	○	○	○
I expect I can count on Proseeds to consider how its actions affect me.	○	○	○	○	○
I expect that Proseeds intentions are benevolent.	○	○	○	○	○
I expect that Proseeds puts its users interests before their own.	○	○	○	○	○
I generally trust other people.	○	○	○	○	○
I tend to count upon other people.	○	○	○	○	○
Proseeds is competent.	○	○	○	○	○
Proseeds understand the market it works in.	○	○	○	○	○
Proseeds knows about online giving.	○	○	○	○	○
Proseeds knows how to provide online security.	○	○	○	○	○

Prototype Specific User Survey Questions

After completing the questions, the users would pause for a moment before being shown the second website. They were allowed to browse this second website like the first. After viewing the second web page, users would then advance to a series of questions identical to the first set.

After completing the main experiment, we asked participants to answer a short follow up survey:



RESULTS

Testing Results

To determine if messaging would impact an individual's reported likelihood to signup with Proseeds, we asked participants to indicate their response on a scale from 1 to 10 (1 is

extremely unlikely, 10 is extremely likely). A Wilcoxon signed-rank test showed that the new messaging (Message 2) elicited a statistically significant change in an individual's reported likelihood to signup ($Z = -2.536$, $p = 0.011$). The median score for "Message 1" was 2.50 while the median score for "Message 2" was 5.50.

We also looked to see if design would impact an individual's reported likelihood to signup with Proseeds. After each homescreen, we asked participants a series of questions including their likelihood to signup with Proseeds. A Wilcoxon signed-rank test failed to show a statistically significant change in response ($Z = -1.396$, $p = 0.163$). The median score for "Design 1" was 2.5 while the median score for "Design 2" was 3.

To further investigate the impact of design on individual users, we also looked at eye tracking data to compare the first impressions of users. Only eye data for first impressions was used as this was believed to ensure the most natural eye pattern movement. In addition, eye data for first impressions would not be subject to any familiarity bias due to no prior exposure of similar content.

With the original website, users viewed the primary content area for an average of 13.8 seconds. The heat map (refer to Figure 1.1: Design 1 Message 1) for the original website shows that users do not fixate on the message and their visual attention seems to be devoted to the background image. A great deal of attention, as indicated by the hot spots, is paid to the multiple people in the background image.

Figure 1.1. Design 1 Message 1

In comparison to the website that utilized a new design and different messaging, users viewed the primary content area for an average of 17.6 seconds. The heat map (refer to Figure 2.1: Design 2 Message 2) for the new website shows that users focused on reading the message as well as looking at the face of the one individual pictured in the background. Hot spots on the heat map show a great deal of attention to the word "their", which is important as that was determined to be an important message that was desired to be communicated in this design.

Figure 2.1. Design 2 Message 2

It is interesting to compare the heat map of the website that utilized the same messaging as in the original website and positioned according to the new design (refer to Figure 3.1: Design 2 Message 1). Here we also see that user attention is focused on the messaging and not the background image. The hot spot on the first part of the word "Automatically" shows that user attention is focused at this location. Total time spent on this image averaged 7.5 seconds. In comparison to the same design with different messaging (which averaged 17.6 seconds), this is a much shorter period of time given to this section of the website's homepage.

Figure 3.1. Design 2 Message 1

The original design with new messaging shows that, despite the significant difference in messaging, the impact of design can not be understated. In this version of the website (refer to Figure 4.1: Design 1 Message 2) the individuals depicted in the background image are once again the focus of user's attention. Average total time spent on this image is 13.5 seconds, which is roughly equivalent to the same design with original messaging (13.8 seconds).

Figure 4.1. Design 1 Message 2

What is very important to Proseeds' success is an understanding, from the user, of how the platform works. We next take a look at the different ways of conveying this information.

In the original design (refer to Figure 1.2) total time spent was 13 seconds.

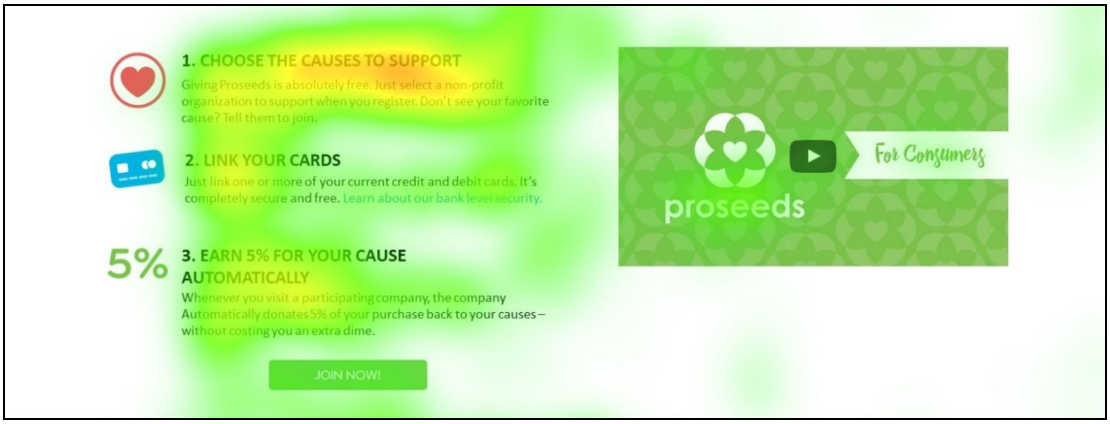


Figure 1.2. Design 1 Message 1

In the same design but new message, users spent an average of 9.1 seconds viewing this area. It is interesting to note the hot spot in the video that says "for consumers." It appears this terminology may not be familiar to the users and drew their attention, but not necessarily for a positive reason.

Figure 4.2. Design 1 Message 2

In the redesign (refer to Figure 3.2) total time was an average of 14.3 seconds. This is more time than the original design.

Figure 3.2. Design 2 Message 1

In the redesign (refer to Figure 2.2) total time was an average of 8.5 seconds.

Figure 2.2. Design 2 Message 2

We also performed a qualitative thematic analysis in order to identify key themes that may have differed between individuals who saw "Message 1" and "Message 2.". Two key themes emerged relating to perceptions of who was donating money: the first theme was "I give money" and the second theme was "they give money". The first theme, "I give money," was found exclusively in responses from individuals who were exposed to "Message 1." Responses included wording such as "your money goes to that company," "you will be donating 5%," and "you donate money using your credit card." The second theme, "they give money," was found exclusively in responses to individuals who were exposed to "Message 2." Responses to this theme included wording like "that business will donate a percentage to the cause you choose," "Proseeds says they will give 5% based on every transaction," and "companies donate some of their profits to charitable organizations."

DESIGN RECOMMENDATIONS

We have come up with the following design recommendations based on our data collection and analysis efforts:

First, we recommend that the main graphic on the website homepage be redesigned to display an image like that pictured in our design four prototype. In addition, we recommend that the primary text be reduced in size as the large size has been shown to foster distrust. The heat maps that were generated as a result of our eye-tracking analysis show that the original main graphic is distracting with users fixating on the individual people and not the main message text. The image we chose in our design depicts an individual with the face partially covered by the individual's hands. The heat maps show that users are fixating less on the background image and more on the text in the proposed redesign.

Second, we propose that messaging throughout the home page be changed to more closely align with that of our redesign. There are several data points that suggest this may lead to improved intent to sign on with Proseeds. We found that users spend less time reading the new

messaging and are able to comprehend the messaging with greater accuracy than the original. In our study, we found users' descriptions of what Proseeds does to be more accurate when users were exposed to the alternative messaging we developed. This is in contrast to the original messaging where users often reported incorrectly who was the responsible party was for donations.

Third, we suggest that the design and messaging of the "How it works" section be changed to more closely align with the design and messaging of our redesigned prototype. Our data analysis showed that individuals were spending more time reading this content without substantial comprehension gains as compared to the redesigned prototype website. The redesigned prototype website utilized horizontal message flow as well as key colors that helped to establish familiarity with the other components of the website. Our eye tracking showed that individuals did not look at the video area, however by placing key company information in a separate "about us" section saw significant improvement of user attention being given to this content.

Fourth, we suggest that the overall structure of the website be altered significantly in order to more clearly emphasize key components of Proseeds' platform. Our interviews with individuals who navigated the existing Proseeds website found that there were many aspects of the website that were confusing and distracting. Chief among these were the multiple search bars that were visually identical to one another. Users of this version of the website were distracted by the inconsistent use of color and unable to ascertain the purpose or the ways in which these search bars were to be used.

Fifth, we propose an additional study that looks to investigate trust as perceived by existing users of Proseeds. Our interviews with existing Proseeds users suggested that these individuals may have several trust grievances: ability to remove associated credit card data and cancel a Proseeds account, concerns regarding the use of individual's earned Proseeds dollar amounts.

CONCLUSION

Goals and Objectives

The initial goals of this project were to measure how users perceive trust on online business websites. We studied Proseeds' website to target our goals. More specifically, we originally sought out to identify which features on their original website were deterring users in signing up for the service. In order to find such influential features, we had to set both design goals, messaging goals, and goals that combined both design and messaging. Our design goals included such modifications that would only include layout, font types, and icon changes. It is important to note that we did identify that icon changes overlapped with our messaging goals. Our messaging goals included rewording of text, adding and removing pictures, adding new feature sections, and icon changes. With these revisions, we set eye-tracking goals around

measuring which features users took attention to. Supplementing the eye-tracking, we had users fill out surveys to further reach our objectives. In addition to accomplishing our primary goals, we found significant evidence from our alterations.

We have shown that a few simple visual alterations to the Proseeds website can increase user trust as measured by intention to sign up for the Proseeds service. In addition, alterations to the physical text not only helped with conversion rate, but also resulted in significantly improved comprehension of key Proseeds messaging.

Through this effort we have shown that design alone can impact individuals trust in a website. This is a significant contribution to the Interaction Design community as prior literature had little empirical evidence that spoke to these findings. We also found that messaging in combination with design changes had the greatest impact on users' intent to sign up for the Proseeds service.

LIMITATIONS

While we found significant evidence from our design and messaging modifications, we faced some limitations. For instance, this study measured intent to sign up with Proseeds. Real-world sign up rates would need to be investigated with an A,B test on the live website in order to increase our certainty that results would apply in a real-world setting. Another factor that would more accurately represent potential users' trust would simply be to gather more participants.

This study utilized 16 participants to complete our prototype testing and evaluation. A future study would need to increase the number of participants in order to achieve higher statistical reliability. This would inherently require a greater amount of time due to the eye-tracking setup and maintenance to ensure accuracy. In addition to the accuracy of the eye-tracking experiments, the we must also consider the types of users that would need to be recruited for future study.

Since most of our users were primarily that of college students between the ages of 19-22, our experiments were initially biased due to a narrow demographic set. However, this does not represent that of Proseeds' consumer base; Proseeds users are of many different ages and internet experience levels. A future study should look to include many diverse users that attempt to maximize representativeness of Proseeds' user base.

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