The Role of Intermediaries in the Development of Trust on the WWW: The Use and Prominence of Trusted Third Parties and Privacy Statements

Jonathan W. Palmer
Joseph P. Bailey
Samer Faraj
Robert H. Smith School of Business
University of Maryland

Table of Contents

- Abstract
- Introduction
- Theoretical Background
  - Building Trust
  - Role of Intermediaries
  - Factors Affecting Trust Signals
- Methodology and Sample Data
  - Identification of Firms
  - Collection of Independent Variables
  - Collection of Dependent Variables
- Analysis and Discussion
  - Further Research
- Conclusion
- Footnotes
- References
- About the Authors

Abstract
Developing trust between suppliers and consumers is critical for the continued growth of Internet commerce. This article presents an empirical investigation into how firms promote trust by exploring the use and prominence of Trusted Third Parties (TTPs) and privacy statements. The Web sites of 102 publicly held firms with predominantly Internet based businesses were examined for their use of TTPs and privacy statements, the number of links, currency of the Web site, length of time the Web site had been operating, traffic, and financial performance. Surprisingly, only 17 of the firms utilized trusted third parties and only 45 had privacy statements. The article presents a methodology for the analysis of four propositions that explore the relationship of embeddedness and a firm's length of time online to the use and prominence of TTPs and privacy statements. The exploratory data in this article clearly supports the proposition that the use of TTPs and privacy statements increase with the embeddedness of the Web site. This article then discusses the potential reasons for this finding including how TTPs strategically solicit firms and why trusted firms may be more likely to be embedded. The remaining three propositions show mixed results but provide insight into the strategic use of TTPs and privacy statements. One key insight is that TTPs and privacy statements are actually used quite differently by firms to promote trust in Internet commerce.

**Introduction**

The growth of the Internet, from under 10 million active users less than a decade ago to 81 million users in the United States alone (emarketer, 1999), has generated a new set of relationships among the companies vying for a space within this competitive marketspace. The strategies adopted by firms competing on the Internet have taken many shapes and forms, ranging from full scale online storefronts with full product descriptions and sales transaction support to promotional materials to simple product information tying users to existing physical channels of distribution (Palmer & Griffith, 1998).

The strategic development of Web sites to support specific marketing activities has been one aspect of the emerging strategies on the Web (Griffith & Palmer, 1999). A first phase had firms rushing to "get on the web" by adapting existing catalog approaches to the electronic medium and recreating existing forms, brochures, reports, and product or company descriptions to the HTML format. The next phase of strategy development goes beyond the recreation and extensions of existing marketing approaches into the fuller recognition of the marketspace as a viable alternative to traditional media and a new arena for developing personalized relationships with customers (Dreze & Zufryden, 1998). Trust becomes a critical component of this relationship as a strategic mechanism for improving customer connections (Speier, Harvey, & Palmer, 1998).

This emerging strategy includes the ability to position a firm's Web...
site as a site of choice via the portals through which many of the Internet users gain access to the World Wide Web (WWW). The payment for this access is growing to a significant marketing investment on the part of many firms. As this movement for advertising space and connections with the portals intensifies, the issues of how to best position firms within the marketspace has become increasingly important. The use of intermediaries has become an important part of organizational Web site strategy (Sarkar, Butler, & Steinfield, 1995).

Trust is a particularly essential component in Internet commerce. Trust has been shown to be essential in exchange relationships due to the embeddedness of actors in an ongoing system of social relations (Granovetter, 1985; Mayer, Davis, & Schoorman, 1995), and the uncertainty existing between trading partners (Kollock, 1994). In the electronic commerce literature, trust is emerging as a potentially potent strategic element in organizational Web site development. In a recent survey conducted by an ISP, over half of Americans polled said that "privacy and security" is one of their biggest concerns about Internet commerce (Cox, 1999).

This article examines the strategies utilized by firms in building trust in their Web sites. We concentrate on an intermediary type not specifically identified by Sarkar, Butler, and Steinfield (1995), the trusted third party (TTP), as well as on the presence of a site-originated trust signal, the privacy statement. Such statements have recently emerged as an important area of consumer concern (Mendel, 1999). The research will utilize technical details on specific firm Web sites to develop an enhanced understanding of the business issues of developing trust. More specifically, the use of trusted third party intermediaries will be explored to answer the basic research question:

*When and how will firms use trusted third parties and privacy statements to build trust on their Web sites?*

The article has five sections. The initial section provides theoretical background on trust and Web site models. The following section addresses the application of these principles within the context of the WWW and generates specific research questions. The third section describes the methodology employed to address this research question empirically. The fourth section presents the results. The fifth and final section discusses the research results and suggests conclusions and suggestions for future research.

**Theoretical Background**

Research on trust has generated a number of definitions that are often context and relationship specific. Researchers have highlighted the risk involved (Johnson-George & Swap, 1982), the presence of some meaningful incentive at stake (Kee & Lnox, 1970) and the vulnerability of a party (Boss, 1978) in different
conceptualizations of trust. We view trust in the context of exchange relations and adopt Zucker's (1986) perspective of openness to social influence from a third party acceptable to both parties. Another component of trust is manifest when individuals, all else being equal, choose to transact with those of known reputations or with whom they have had previous dealings (Granovetter, 1985; Shapiro, 1987). Though generated prior to the widespread use of the Internet for commerce, these components of trust also apply to Internet commerce, which relies on mediated interaction between buyer and seller.

Building Trust

To build trust Web sites representing specific firms can concentrate on projecting information on their capabilities, relationship to the potential buyer, and overall integrity (Industry Standard, 1999). Capabilities refer to skills and competencies a seller has in a particular area. Sellers need to convince buyers of their ability to deliver products or services reliably at an acceptable level of quality. The seller should also project benevolence or a willingness to look beyond short-term profits and take buyer needs and welfare into account. Integrity refers to the buyer's perception that the seller adheres to a set of principles that the buyer finds acceptable. To build trust, this relationship extends to the handling of personal information collected from the buyer (Hoffman, Novak, & Peralta, 1999). Announcing the site's privacy policy is considered good business practice and allows consumers to make informed decisions about using the site and disclosing their personal information (Culnan, 1999; Hansen, 2000). Thus, together, ability, benevolence and integrity are important in establishing trustworthiness, where trustworthiness is viewed as a continuum rather than a binary outcome (trustworthy or not trustworthy).

Trust in economic exchange relations will take different forms depending on the degree of social embeddedness existing between the two parties. The more "undersocialized" or purely economistic the actors' behavior, the higher the need for institutional arrangements such as contracts or authority structures (Shapiro, 1987). Because of the lack of social context and virtualness of Internet exchanges, an essential building block for Internet transactions is the development of institutional arrangements and standards. Both contracts and standards are acknowledged as general mechanisms to generate trust and reduce the threat of malfeasance (Borys & Jemison, 1989). Contracts are used when multiple parties or parties not knowing or trusting each other well are involved. The emergence of industry standards or practices is frequently relied upon to structure an economic transaction. In the Internet context, several possibilities for increasing the level of trust have been suggested, most notably the use of privacy statements, encryption, and the imprimatur of a trusted third party, or "honest broker," assuring customers that transactions will be handled in accord with a generally accepted set of principles. Borys and Jemison (1989) suggest that the development of trust initially springs from a set of contractual relationships and then moves to a
more generally accepted set of industry or societal rules of conduct. There are, of course, higher levels of trust that eventually emerge with repeated transactions and sharing of information. However, for the purposes of establishing trust quickly within the virtual marketplace, the focus of this article will be on the initial two elements of developing trust: contractual or legal documentation, and the development of an industry norm or code of conduct.

Online privacy is receiving increased attention in the media and from policymakers, such as in the Federal Trade Commission’s report to Congress on online privacy (1998). Consumer concerns are affecting Internet commerce as a recent study revealed that purchases via the Internet could receive a $6 billion boost by the year 2000 if consumers believed their privacy wasn’t at stake during such transactions (Greene, 1997). Another recent survey found that compliance with providing basic privacy policy information to be generally low but noted that more popular sites had higher levels of compliance (Culnan, 1999).

Trusted Third Parties (TTPs) are one set of organizations that try to promote trust on the Web. A TTP will display its logo on a firm’s web site if that firm has demonstrated that it conforms to the policy of the TTP. Two of the most notable Internet TTPs are TRUSTe and BBB Online. TRUSTe is a non-profit company that is trying to reduce consumers’ fears about privacy violations by allowing Internet retailers to display the TRUSTe seal only if the retailer has agreed to disclose their privacy policy. BBB Online, another TTP, is the Internet counterpart to the Better Business Bureau and the trust roles it plays in the physical market. The Industry Standard (1999) reported that TRUSTe and BBB Online are two of the top three “security brands” that increases trust in Internet commerce transactions among those familiar with the brands. The third brand, VeriSign, only focuses on encrypting the packets exchanged between the browser and the server. It protects the traffic between the two sites from third parties and does not focus on the content of the site or its business practices. Thus, in this study, we focus only on TRUSTe and BBB. Internet retailers who post privacy policies suggest another way to promote trust. By disclosing the privacy policy of the firm, the consumer has more information about the firm with whom they may transact. Some of the impetus for this can come from the exchange partners. For example, IBM caused a stir by announcing that it plans to stop advertising on Web sites that do not post privacy policies (Wang, 1999). One of the benefits of using privacy statements over a TTP is that a firm does not have to rely on an intermediary. Rather, the Internet retailer is trying to form a trusted relationship directly with the consumer.

Role of Intermediaries

In the highly fragmented environment of the Web, intermediaries can take on many roles to help promote transactions (Heck & Vervest, 1998). While there is no accepted taxonomy of intermediary roles, Bailey (1998) groups the roles into four main categories: aggregation, pricing, search, and trust. When the roles
are transferred to an electronic medium, the intermediary roles may change in implementation but not in theory. The intermediary in an electronic medium may support a range of activities including the search and information gathering processes, transactional functions, and confirmatory, auditing, and control role (Sarkar, Butler, & Steinfield, 1995).

Trust is one of four roles that Bailey and Bakos (1997) found to be of increasing importance as markets move from physical space to Internet space because of limitations of the electronic medium to gauge trustworthiness of a trading partner. In order to reduce the quality risk for the buyers they try to establish a good reputation and trust. Intermediaries building trust can be described as advisors or guarantors. Sarkar, Butler and Steinfield (1995) suggested that cybermediaries (such as web retailers) can also engender trust simply because of their relatively unbiased position as a seller of multiple producers' goods.

In the context of electronic commerce and especially from the consumers' perspective, the intermediary as guarantor is the most important one and is the focus of this research. Users place trust in the integrity of the intermediary (Coleman, 1990). This role of social institutions to assuage the fears of consumers by developing a trustworthy reputation in order to facilitate engagement in transactions over the Internet represents the much-needed foundation of “trust” in electronic economic exchange. This reputational aspect of trust is one of the fundamental requirements for electronic commerce to flourish, at least in the consumer market.

Factors Affecting Trust Signals

An important characteristic of the Web is its ability to support linkages in the form of hyperlinks. Many web sites develop detailed sets of linkages to other sites they find compelling and worthwhile. Presumably, this is provided as a service to visitors and to provide a stamp of approval to other sites. This has led some researchers to view the web as a social network spanning large distances (Wellman & Gulia, 1996). These social relations (not necessarily reciprocal) may be another antecedent of trust for web customers. Indeed, the fact that an independent site found the seller's site worthy of linking to, becomes a trust signal. From the seller's side, a strategy of promoting third party linkages to the site is likely to be part of a strategy emphasizing all aspects of trust. Thus, social context, viewed here through the prism of embeddedness in a network of hyperlink ties, becomes again a major factor in social and economic exchanges on the Internet.

The extension of this strategy is the within-industry set of connections, deciding which of the affiliated products and service firms within a firm’s sphere of influence are appropriate for developing and maintaining connections for generating potential leads and customers. The key research question is what level of social embeddedness, reflected in the number of incoming links, is most likely to have the greatest use for a trusted third party. This
suggests the first proposition for the research:

**P1. More highly embedded Web sites will show higher use of trusted third parties.**

and its corollary

**P1a. More highly embedded Web sites will show higher use of privacy statements.**

The social embeddedness of a site may reduce the necessity of emphasizing the other more direct trust elements. Web site functions are typically of three types and include 1) providing information only, 2) supporting the sales transaction, and 3) providing promotional incentives for users to visit (Hoffman & Novak, 1996; Ho, 1997). The increasing size and scope of Web sites has often made sites difficult to navigate and created concerns regarding privacy and trust. The more complex the functionality and the wider the array of potential options, the harder it may be to generate trust among the potential customers (Foster & Allard, 1999; Simmons, 1999). Prominence of the trust elements (TTPs and privacy statements) may be related to this site complexity and embeddedness. The increased complexity and focus on navigability suggests a second proposition:

**P2. More highly embedded sites will show lower visibility of trusted third parties.**

and its corollary

**P2a. More highly embedded sites will show lower visibility of privacy statements.**

Because the web can be used for diverse purposes (e.g., as a communications medium, distribution channel, and information-rich database), the WWW site owner faces a challenge in creating pages and web applications that make sense for specific uses and users. Because the web is a relatively new medium, the experienced site owner is likely to have learned a significant amount about web commerce. Due to time spent building brand and reputation, there is less need to emphasize trust elements. Early adopters of the Web often had an advantage in site development, but have been aware for a long time of the earliest concerns on the Web regarding privacy and trust (GVU, 1995, 1996, 1997). This suggests a third proposition:

**P3. Firms with a longer history on the Internet will show higher use of trusted third parties.**

and its corollary

**P3a. Firms with a longer history on the Internet will show higher use of privacy statements.**
A final strategic issue facing Web site developers is the extent to which the TTP and privacy statements should take a prominent role on the Web site interface. With additional experience and time on the Internet, the symbols of trust will take on a lesser role for existing customers, although they may be important for newer customers (Hoffman & Novak, 1999). This suggests the final propositions:

\[ P4. \text{ Firms with a longer history on the Internet will show lower visibility of trusted third parties.} \]

and its corollary

\[ P4a. \text{ Firms with a longer history on the Internet will show lower visibility of privacy statements.} \]

This article presents a methodology for an empirical exploration of these four hypotheses. After the methodology, the article presents some preliminary data which supports the first proposition, but then shows mixed results for the remaining three propositions.

**Methodology and Sample Data**

To test the four propositions in this paper, we use a methodology of collecting firm-level data and then performing an empirical analysis through clustering. In this section, we describe how we collected the data and firm demographics of the sample data we use. There are three main parts to our data collection methodology:

- Identification of Internet firms.
- Collection of third-party data for independent variables.
- Structural analysis of Internet firms' web sites for dependent variables.

In this way, we hope to collect the firm-level data to test the propositions.

**Identification of Firms**

Our goal in selecting a set of firms to investigate is to find a significantly sized sample of publicly traded Internet companies. We chose publicly traded companies because we wanted to eliminate the Internet companies who had given little or no thought to their strategy for building trust on the Internet and, therefore, inclusion of such a firm would not add to our analysis. We were able to generate a list of 102 companies for our analysis by taking the union of publicly traded Internet companies on three separate lists: Dow Jones, Yahoo, and Internet World. A summary of the types of companies is shown in Table 1.
Collection of Independent Variables

We chose two independent variables, the length of time a firm has been on the Internet and the embeddedness of the firm, to test the propositions in this paper. The length of time a firm has been on the Internet was measured by using Alexa (www.alexa.com), a third party data source. Alexa reports the time that a firm registered their domain name with Network Solutions, the .com domain name registry. We then use this data to cluster firms in six categories (pre-1994, 1995, 1996, 1997, and 1998) which correspond to the year they first registered their domain name. The second independent variable is the embeddedness of the firm. We use the number of links into a web site as a proxy variable for the embeddedness of the firm. In other words, the more links to a particular web site, the more embedded it is within the web. Again, we used Alexa data that reports the number of links into a firm's web site. We then clustered the firms into five separate clusters (0-99 links, 100-999, 1,000-9,999, 10,000-99,999, and 100,000-999,999), which correspond to the base-ten logarithm of the number of links in. We also collected the size of a firm's web site (how many static web pages it has), traffic (the number of visits a web site has for a six month period), and a subjective user rating from Alexa but we did not use either independent variable to test the paper's propositions.

Collection of Dependent Variables

The third phase involved identifying a firm's usage of privacy statements and trusted third parties (TTPs) through structural analysis of the firm's web site. Specifically, we collected the use and depth of privacy statements and TTPs. We matched the set of companies in our list with the participants listed on the two TTPs' web sites (BBB Online and TRUSTe). We assigned a value of 0
(neither), 0.5 (one TTP), or 1 (both TTPs) to each firm. For each firm that participates in either program, we then measured the depth of the TTP logo by measuring the minimal number of clicks from the firm's main web site to a mention of the TTP. In our data set, we found that the TTP was listed two clicks away or less. By going to each web site, we collected a binary variable about the use and depth of privacy statements. In this case, the use of a privacy statement is either 0 (not used) or 1 (used). The depth of the privacy statement is the minimal number of clicks to see the privacy statement. In our sample, no privacy statement was placed more than two clicks away from the main page. In summary, Table 2 describes the key measurements in this study which comprise the dependent and independent variables.

Table 2. Key Measures

<table>
<thead>
<tr>
<th>Item</th>
<th>Measures</th>
<th>Values</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trusted third party</td>
<td>Use</td>
<td>0, 0.5, 1</td>
<td>Structural analysis</td>
</tr>
<tr>
<td></td>
<td>Depth</td>
<td>0, 1, 2</td>
<td>Structural analysis</td>
</tr>
<tr>
<td>Privacy statement</td>
<td>Use</td>
<td>0, 1</td>
<td>Structural analysis</td>
</tr>
<tr>
<td></td>
<td>Depth</td>
<td>0, 1, 2</td>
<td>Structural analysis</td>
</tr>
<tr>
<td><strong>Independent Variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Embeddedness</td>
<td># links into site</td>
<td>Integer</td>
<td>Alexa</td>
</tr>
<tr>
<td>History</td>
<td>Year established</td>
<td>Year</td>
<td>Alexa</td>
</tr>
<tr>
<td>Size</td>
<td># pages on site</td>
<td>Integer</td>
<td>Alexa</td>
</tr>
<tr>
<td>Performance</td>
<td>Traffic - # of site visits</td>
<td>Integer</td>
<td>Alexa</td>
</tr>
<tr>
<td></td>
<td>Alexa rating</td>
<td>0.5-5</td>
<td>Alexa</td>
</tr>
</tbody>
</table>

As we suspected, there was strong correlation among many of the variables in Table 2 because higher firm brand equity may be correlated with more than one variable (see Table 3). For example, the more embedded the firm is, the more likely it is to have greater traffic. Because of the correlation, the analysis can just use one of...
the four highly correlated variables (links in, pages, rankings, and visits) as a proxy to a firm's brand equity or social capital. For this article, we selected embeddedness (the number of links to a firm's web site) for the remainder of the analysis because Alexa's measurement of embeddedness has been validated by other third party data sources such as Link Exchange and AltaVista as described in Bailey, Yao, and Faraj (1999). The other independent variable not correlated with links in is the year the firm's web site was established. This is a proxy variable for measuring the amount of Internet experience a firm has. The year established variable is correlated only with the number of pages variable; which was a variable with some suspect qualities, as Alexa provided specific data only up to 1000 pages.

Table 3. Key Site Characteristics

<table>
<thead>
<tr>
<th>Correlation (Pearson, 2 tailed) and Descriptive Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Pages</td>
</tr>
<tr>
<td>Rankings</td>
</tr>
<tr>
<td>Visits</td>
</tr>
<tr>
<td>Year Established</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Median</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Links In</td>
<td>649</td>
</tr>
<tr>
<td>Pages</td>
<td>782</td>
</tr>
<tr>
<td>Rankings</td>
<td>1.5</td>
</tr>
<tr>
<td>Visits</td>
<td>2456</td>
</tr>
</tbody>
</table>

Significance * < .05 ** <.01

Clustering, the grouping of similar firms, is used in this analysis so that we explore the similar strategy of a group of firms. The methodology of clustering is used in the strategy literature to understand how different types of firms form different strategies. For example, Hergert (1983) and Dess and Davis (1984) cluster firms into firms with similar investments in advertising. By clustering firms together, we are able to determine consistency in strategy across a larger set of firms. In this analysis, we form clusters of the companies by using two different metrics: embeddedness and online date.

The embeddedness measure is a proxy for the brand equity or
social capital a firm has because of the degree to which it is embedded in the Internet. We use Alexa's measure of "links in" to measure the embeddedness of the firm and group the firms using logarithmic scale as shown in Table 4. Table 4 indicates how many firms, out of the total 102 firms in the data set, are in each cluster. As the table shows, there are five clusters ranging from the ones with lowest brand equity (0-99 "links in" cluster) to highest brand equity (100000-999999 "links in" cluster).

Table 4. Clustering of Firms Relative to Embeddedness and On-Line Date

<table>
<thead>
<tr>
<th>Cluster</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>C5</th>
<th>C6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Links to a Firm's Web site</td>
<td>0-99</td>
<td>100-999</td>
<td>1,000-9999</td>
<td>10,000-99,999</td>
<td>100,000-999,999</td>
<td></td>
</tr>
<tr>
<td>Number of Firms</td>
<td>21</td>
<td>33</td>
<td>30</td>
<td>10</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cluster</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>C5</th>
<th>C6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Firms</td>
<td>15</td>
<td>26</td>
<td>24</td>
<td>15</td>
<td>16</td>
<td>6</td>
</tr>
</tbody>
</table>

The on-line date of a firm is used as a proxy for the amount of experience an Internet firm has. Currently, many firms are experimenting with Internet technology and strategy. As Bailey (1998) points out, this experimental learning can give a first mover an advantage over the older, more experienced firms. For example, Amazon.com's success in the Internet book retailing business has arguably come from their position as a comparatively older firm. Table 4 shows the number of firms in the different clusters determined by the year that the firm registered its domain name (i.e. the "on-line date").

We compared the firms' embeddedness and on-line date to the firms' use of TTPs and privacy statements by undergoing a structural analysis of the firms' Web sites. In the first part of the analysis, i firms are examined for their use of trusted third parties (TTPs). With j TTPs, there are i * j dyads that are examined (in our study j = 2). For each dyad, we collected two observations: U is a binary variable that indicates the usage (U = 1) or non-usage (U = 0).
of the trusted third party by a firm. To gauge the prominence of the use of TTPs, we measure $D$ -- the minimum number of clicks it takes to go from the firm's main web page to the TTP. $D$ is an integer that is greater than or equal to zero. In the second part of the analysis, we examine all $i$ firms for their use ($U$) and depth ($D$) of privacy statements exactly. Therefore, the total number of observations is $i^* (j + 1)$.

The use of TTPs by cluster can be calculated by simply counting the number of dyads in each cluster where $U$ is equal to one relative to the total number of dyads. $USE$ is then a number between zero and 100% as described by equation 1. In other words the diffusion for cluster X (where X ∈ [0,5] when firms are clustered by embeddedness and X ∈ [0,6] when firms are clustered by on-line date):

$$USE_{CXR} = \left( \frac{\sum U_r}{\sum \forall r, i, j | r \in CX} \right)$$

The prominence of TTPs and privacy statements by cluster can be calculated by averaging the depth of the TTP and privacy statements across all firms in a cluster and weighted by the depth. As the depth of the TTP's logo or the firm's privacy statement increases, their prominence decreases. There are a number of ways that the depth variable could be weighted to show less prominence. For example, using the weighting would mean that the prominence of the statement dissipates similarly to the way a ripple in the water dissipates. To be more conservative in our estimate, we do not square the term in the denominator and use the general form of to measure the dissipation of the prominence. In other words, a TTP one click from a firm's first Web page ($D = 1$) is weighted as $1/2$ (50% as prominent as being on the first page), not $1/4$ (25% as prominent). The prominence is likely to be related to the probability a web user sees the TTP or privacy statement conditional on the fact that they have viewed the content on the firm's main web page. Unfortunately, we do not have the empirical data to validate this. Equation 2 below describes this variable in terms of the observed metrics. If the TTP's or privacy statement is on the first page ($D = 0$) for each participating firm in a particular cluster, then the $PROMINENCE$ variable is 100% for that cluster. If the TTP or privacy statement is on the second page ($D = 1$) for each participating firm in a particular cluster, the $PROMINENCE$ variable is 50%. As the TTP and privacy statements become less prominent, the variable $PROMINENCE$ decreases and approaches zero.

$$PROMINENCE_{CXR} = \frac{1}{1 + \left( \frac{\sum D_r}{\sum U_r} \right)}$$


11/10/01
We use the two calculations of \textit{USE} and \textit{PROMINENCE} to analyze the data we collected and test the four propositions in this article. The general form of the analysis will be to look at the \textit{USE} and \textit{PROMINENCE} for TTPs and privacy statements for the firms in the different clusters. The next section describes the findings of this analysis.

**Analysis and Discussion**

In the exploratory data set, the 102 firms were examined for use of two TTPs (TRUSTe and BBB Online). Therefore, there are 204 dyads with respect to the use of TTPs. Because there are two observations per dyad and two more observations per firm regarding the use and prominence of privacy statements, there are a total number of 612 observations used in the analysis of the article. Because only 17 of the 102 firms used trusted third parties and only 3 of the 17 used both TRUSTe and BBB Online, the actual number of dyads that required thorough analysis was 20 (14 firms that used one TRUSTe or BBB Online plus 3 firms that used both). Furthermore, only 45 of the 102 firms had privacy statements so this also reduced the amount of data that was collected. The results of the analysis are summarized in Table 5 for embeddedness and in Table 6 for Internet experience.

**Table 5. Data Grouped by Embeddedness**

<table>
<thead>
<tr>
<th></th>
<th>0-99</th>
<th>100-999</th>
<th>1000-9999</th>
<th>10000-99999</th>
<th>100000-999999</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Privacy Statements</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Firms</td>
<td>5</td>
<td>11</td>
<td>14</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>\textit{USE}</td>
<td>24%</td>
<td>33%</td>
<td>48%</td>
<td>80%</td>
<td>87%</td>
</tr>
<tr>
<td>Depth 0</td>
<td>80%</td>
<td>64%</td>
<td>79%</td>
<td>88%</td>
<td>100%</td>
</tr>
<tr>
<td>Depth 1</td>
<td>20%</td>
<td>36%</td>
<td>14%</td>
<td>12%</td>
<td>0%</td>
</tr>
<tr>
<td>Depth 2</td>
<td>0%</td>
<td>0%</td>
<td>7%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>\textit{PROMINENCE}</td>
<td>83%</td>
<td>73%</td>
<td>78%</td>
<td>89%</td>
<td>100%</td>
</tr>
</tbody>
</table>


11/10/01
### Table 6. Data grouped by On-Line Date

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Firms</td>
<td>3</td>
<td>14</td>
<td>16</td>
<td>5</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>USE</td>
<td>19%</td>
<td>52%</td>
<td>64%</td>
<td>33%</td>
<td>33%</td>
<td>33%</td>
</tr>
<tr>
<td>Depth 0</td>
<td>100%</td>
<td>93%</td>
<td>75%</td>
<td>100%</td>
<td>60%</td>
<td>50%</td>
</tr>
<tr>
<td>Depth 1</td>
<td>0%</td>
<td>7%</td>
<td>19%</td>
<td>0%</td>
<td>40%</td>
<td>50%</td>
</tr>
<tr>
<td>Depth 2</td>
<td>0%</td>
<td>0%</td>
<td>6%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>PROMINENCE</td>
<td>100%</td>
<td>93%</td>
<td>76%</td>
<td>100%</td>
<td>71%</td>
<td>67%</td>
</tr>
</tbody>
</table>

### Table 6. Data grouped by On-Line Date

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Firms</td>
<td>3</td>
<td>14</td>
<td>16</td>
<td>5</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>USE</td>
<td>19%</td>
<td>52%</td>
<td>64%</td>
<td>33%</td>
<td>33%</td>
<td>33%</td>
</tr>
<tr>
<td>Depth 0</td>
<td>100%</td>
<td>93%</td>
<td>75%</td>
<td>100%</td>
<td>60%</td>
<td>50%</td>
</tr>
<tr>
<td>Depth 1</td>
<td>0%</td>
<td>7%</td>
<td>19%</td>
<td>0%</td>
<td>40%</td>
<td>50%</td>
</tr>
<tr>
<td>Depth 2</td>
<td>0%</td>
<td>0%</td>
<td>6%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>PROMINENCE</td>
<td>100%</td>
<td>93%</td>
<td>76%</td>
<td>100%</td>
<td>71%</td>
<td>67%</td>
</tr>
</tbody>
</table>
With this information, it is possible to analyze the data to test the four propositions proposed earlier. The first test is one of use of trusted third parties and privacy statements versus the embeddedness of the firms. Figure 1 shows that the data supports this hypothesis. As the embeddedness of the firms increases, the percentage of firms that use TTPs and privacy statements increases. Not surprisingly, the use of privacy statements is more prevalent than the use of TTPs because some TTPs, such as TRUSTe, make the posting of a privacy policy a necessary condition for the TTP certification. What is difficult to address from the data is why more embedded firms are more likely to use TTPs and privacy statements.

<table>
<thead>
<tr>
<th>Trusted Third Parties</th>
<th>Number of Firms</th>
<th>0</th>
<th>6</th>
<th>8</th>
<th>2</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>USE</td>
<td>USE</td>
<td>0%</td>
<td>13%</td>
<td>18%</td>
<td>10%</td>
<td>3%</td>
<td>0%</td>
</tr>
<tr>
<td>TRUSTe</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depth 0</td>
<td></td>
<td></td>
<td>20%</td>
<td>67%</td>
<td>100%</td>
<td>0%</td>
<td>-</td>
</tr>
<tr>
<td>Depth 1</td>
<td></td>
<td></td>
<td>60%</td>
<td>33%</td>
<td>0%</td>
<td>0%</td>
<td>-</td>
</tr>
<tr>
<td>Depth 2</td>
<td></td>
<td></td>
<td>20%</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
<td>-</td>
</tr>
</tbody>
</table>

| BBB Online           |                 |   |    |    |    |    |    |
| Depth 0              |                 |   | 50%| 67%| 100%| - | -  |
| Depth 1              |                 |   | 0% | 33%| 0% | - | -  |
| Depth 2              |                 |   | 50%| 0% | 0% | - | -  |
| PROMINENCE           |                 |   | 50%| 75%| 100%| - | -  |
If the impetus for using these trust tools comes from the firms, then there may be numerous strategic reasons why this proposition is true. The firms that are more embedded may have more to loose by not instilling trust in their customers or more to gain if they do promote trust. Therefore, the more embedded firms use TTPs and privacy statements more often. Another possible reason is that the more embedded firms do a better job of providing customer service so they have addressed consumers' need for reducing transaction security on the Internet. It is also possible, if the causality is reversed, that firms that use trust tools become more embedded in the Internet.

The impetus may also come from the TTPs and outside suppliers, such as IBM. Since these firms are looking to maximize the scope of their influence, it is only natural that they target some of the larger, more embedded firms on the Internet. Also, by having the more embedded firms use a particular TTP, it becomes a competitive advantage for the TTP as an agent of trust.

The second proposition may be difficult to support or reject because the prominence of TTPs and privacy statements may be different for a given firm. Figure 2 shows that the more embedded firms actually decrease the prominence of the TTP but those same firms increase the prominence of their privacy statement. While this may not be consistent with Proposition 2 and 2a, there may be a very good explanation for this. The use of a TTP by a retailer allows the TTP to gain brand equity while the use of a privacy statement is intended to promote trust in a direct firm-to-consumer relationship. Since the more embedded firms have their own brand equity, they are not interested in promoting the brand equity of the TTP. However, the less embedded firms do not have as much brand equity as the TTP so by making the TTP information more prominent on their web site, they may increase their own brand equity.

![Figure 1. Use versus Embeddedness](http://www.ascusc.org/jcmc/vol5/issue3/palmer.html)
The experience of firms seems to have a lesser effect on the use and prominence of TTPs and privacy statements. Only 3 of the 16 firms established prior to 1994 had privacy policies and none had TTPs. More than half of the 27 firms established in 1994 had privacy policies and 16 of the 25 firms established in 1995 had privacy policies. However, this growth in privacy policy use has been followed by declines in 1996, 1997 and 1998 as shown in Figure 3. While the relationships shown in Figure 3 are not monotonic, the use of privacy statements and TTPs do track well, similar to those shown in Figure 1.

The findings with respect to prominence of TTPs and privacy statements are presented in Figure 4. TTP prominence decreases as the firms are more experienced (i.e., the earlier the on-line date, the less prominent the TTP). This is consistent with the findings in Figure 2 -- the firms that have better brand equity are less likely to promote the brand equity of a TTP. The data about the use of privacy statements would be consistent with the findings from Figure 2 if the firms in the 1996 cluster had average use somewhere between the 1995 cluster and the 1997 cluster. However, there may be an explanation with this data even though it appears to be anomalous at first glance. The firms that entered the market in 1996 represented some of the second movers in the business-to-consumer Internet commerce companies that went into markets beyond computer-related products. Because of the uncertainty in some of these markets, the firms in the 1996 cluster may have a
greater need for promotion of trust without trying to protect their own brand equity.

**Figure 4. Prominence versus On-Line Date**

While the analysis of this exploratory data only confirms one of the four propositions posed, it does show that there may be some strategic decisions behind a firm's use and prominence of TTPs and privacy statements. We found it somewhat surprising that the use of TTPs and privacy statements seem to be used by the same clusters but the prominence of these two trust tools appears to be inversely correlated.

**Further Research**

With the growth of Internet commerce, the importance of trust in the marketplace has only begun to be explored. While this paper tried to address the issue of the strategic use of TTPs and privacy statements in depth, we realize that there are some limitations to the study that warrant further investigation. Fortunately, the Internet has occasioned new analysis tools and provided an opportunity for greater insight into firm strategy because of the public nature of the web site.

While the propositions in this paper were tested empirically, a richer data set is required to test them further. Since the Internet is growing quickly, the number of publicly traded Internet companies to include keeps increasing. While our study captured many of the larger Internet firms, in subsequent research the number of firms could be increased. It is possible that by including more firms, we can define finer granularities of clusters. Furthermore, if this analysis could capture some of the dynamics of the firm strategies, it might be possible to gauge the effect of a firm's adopting a TTP or privacy statement and find evidence in support of a causal relationship between agents of trust and embeddedness. Other possibilities for follow-up research are suggested by the present study. For example, similar to the work of Bailey, Yao, and Faraj (1999), future work could endogenize price information to determine whether or not the use of TTPs and privacy statements allow firms to charge higher prices in the market. The formulation of PROMINENCE could be tested by conducting user surveys to determine if a TTP logo one click away from the main web site really does mean that it has only
50% prominence. Finally, the firms in this sample data could be surveyed to determine why they followed a particular strategy for developing trust on the Internet, to see if we have in fact identified the proper strategic elements of TTPs and privacy statements.

Conclusion

The use of trusted third parties (TTPs) and privacy statements are strategically important questions for many Internet retailers. They may choose to participate in Internet commerce without the involvement of any TTP. They may also participate without disclosing how they use consumer information. However, by using TTPs and privacy statements, an Internet retailer tries to increase consumer confidence by building trust. With greater trust, these retailers may solicit information from web users and encourage these users to conduct commerce with them.

Our analysis shows that the two elements of developing trust on the Internet through TTPs and privacy statements may be very complementary. Since some TTPs, such as TRUSTe, require firms to post privacy statements, there is very little marginal cost in joining a TTP while the benefits may be quite large. The most significant data in our analysis supports the proposition that more embedded firms are more likely to use TTPs and privacy statements. While there does not seem to be a monotonic relationship between firm experience (i.e. on-line date) and use of TTPs, there is a trend in that direction.

One of the key findings of our analysis shows that TTPs and privacy statements can be used differently by Internet retailers. As the firm develops its own brand equity, it is likely that it will try to promote it by reducing the prominence of the TTP, putting the TTP logo deeper into the firm's web site. Meanwhile it may increase the prominence of its own privacy policy.

By using TTPs and privacy statements, Internet retailers can help assuage some of consumers’ concerns about the Internet. While these two tools are different in implementation, they both promise to be part of the growing electronic commerce landscape.

Footnotes

[1] This is how trust is developed between a firm and the TTP. The firm hopes that by displaying the TTP logo on their web site a user will be less likely to question the integrity of that firm. The user will then be more likely to divulge personal information to that firm or conduct e-commerce with that firm.

[2] For more information about TRUSTe, see Benassi (1999)
[3] Alexa is a service that is provided free of charge to help Internet users navigate their way on the World Wide Web. In part, Alexa is client software that runs along with the client’s web browser so that the Internet user can see statistics about the web site they are viewing. Some of the statistics provided by Alexa includes: company information, amount of traffic, subjective user rating, number of links, number of pages, and related web sites. By providing such information to users, Alexa acts as a collaborative filter for the Internet. On April 26 1999, Amazon.com purchased Alexa.

[4] Because Alexa provides objective third party data on the firms' web sites, there is no subjectivity introduced when this data was collected. However, we realize that the transcription of the data on the Alexa web site to our data set, which was done by a graduate student, may have resulted in an error. Therefore, we had a second round of data collection to verify that the data was collected accurately in the first round, which was also done by a graduate student.

[5] This data was collected by the second author of this paper using a consistent web-searching algorithm to remove any coder bias. The algorithm used was to start at a firm's main web page and follow each link off the web page that pertained to customer service or information about the company (i.e. nothing product-specific). This same algorithm was used after reaching a web page one click away from the firm's main web page. Because there are multiple paths that often lead to information about TTPs and privacy statements, the minimal depth number was used.

[6] The depth of privacy statements was collected using the same algorithm as the depth of TTPs.

[7] Another approach would be to do a factor analysis of the three highly correlated variables of links in (embeddedness), pages, ranking, and visits.

References


Communications of the ACM, 42(2), 56-59.


policies. *Internet World*, 17.


### About the Authors

Jonathan W. Palmer is an assistant professor of Decision & Information Technologies, Robert H. Smith School of Business, University of Maryland, College Park. His research interests include the strategic use of information technology, electronic commerce, virtual organizations, and the use of information technology in retailing. His work has appeared numerous peer-reviewed journal articles, book chapters, and in a number of international conferences. Palmer serves on the editorial board of *International Journal of Electronic Markets* and *Electronic Journal of Organizational Virtualness*. Prior to joining the faculty at Maryland, he served on the faculty at the University of Oklahoma and taught at the University of Southern California. His previous academic experience includes administrative positions at the Claremont Colleges, The Fletcher School of Law and Diplomacy and The Harvard Business School. Ph.D., Management Information Systems (Claremont Graduate University).

**Address:** Robert H. Smith School of Business, University of Maryland, Van Munching Hall, College Park, MD 20742

Joseph P. Bailey is an assistant professor at the Robert H. Smith School of Business, University of Maryland. Dr. Bailey's research and teaching interests span issues in telecommunications, economics, and public policy of new information infrastructures with specific emphasis on the economics of the Internet. This includes an examination of which public policies, technologies, and market opportunities exist to reap the benefits of interoperability. Dr. Bailey is currently working on issues related to the economics of electronic commerce and how the introduction of the Internet changes competition and supply chain management. He has written numerous peer-reviewed journal articles, book chapters, and co-edited the book *Internet Economics* with Lee McKnight. He completed his Ph.D. in June 1998 in the Technology, Management and Policy Program at MIT. His interdisciplinary work originates from his technical/economic background. He received his B.S. in Electrical Engineering and Engineering and Public Policy from Carnegie Mellon University and an M.S. in Engineering-Economic Systems from Stanford University.

**Address:** Robert H. Smith School of Business, University of Maryland, Van Munching Hall, College Park, MD 20742

Samer Faraj is an assistant professor in the department of Decision
and Information Technologies at the University of Maryland, College Park. He received his doctorate from Boston University's school of management and has an M.S. in Technology and Policy from MIT. He has almost 10 years of work experience in a variety of consulting and IS positions. His research interests include software team performance, coordination of expertise, the development of knowledge communities, and the adoption of electronic commerce innovations.

**Address:** Robert H. Smith School of Business, University of Maryland, Van Munching Hall, College Park, MD 20742

©Copyright 2000 Journal of Computer-Mediated Communication