

Privacy, Trust, and Justice Considerations for Location-Based Mobile Telecommunication Services

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Abstract

Purpose – The development of location-based services (such as those using Global Positioning Satellite (GPS) systems) has accompanied the growth of mobile telecommunication, providing mobile telephone users with a variety of functions. The present paper considers the benefits and concerns that these location-based services present to consumers.

Design/methodology/approach – The paper identifies issues based upon the academic literature, relevant theory, and current mobile telecommunication developments.

Findings – While location-based services offer many benefits to consumers, issues pertaining to privacy, trust, and justice are significant areas of concern.

Research limitations/implications – Testable research propositions pertaining to consumer behavior are offered to guide future research.

Practical implications – Socially-responsible telecommunication firms should consider the issues that are raised here. They should adopt policies to safeguard data, build trust, and offer consumers fair policies as the firms offer location-based services.

Originality/Value – While much has been written about GPS systems and wireless telecommunications, almost no empirical research has been conducted and little theoretical guidance has been offered to prospective researchers. The present paper reviews the literature from a variety of disciplines and identifies important theoretical areas to guide future research on consumer behavior. The paper identifies important issues for researchers and managers.

Keywords: Global Positioning Systems, privacy, trust, justice, location-based services, mobile telecommunication, mobile telephone, consumer behavior.

Paper type – Literature review

Privacy, Trust, and Justice Considerations for Location-Based Mobile Telecommunication Services

The growth of wireless telephone systems has given rise to new types of service applications. One set of applications are location-based services, which can locate specific businesses or provide other information based on the physical location of the user's mobile telephone. This paper briefly describes the benefits of location-based services, but then focuses on areas of concern for socially-responsive companies. Location-based services raise issues of privacy, trust, and justice which must be addressed.

Benefits of Location-Based Services

In many countries, the development and use of location-based services have enhanced the lives of average citizens. Through the Global Positioning System (GPS) satellite-based location system developed initially for the U. S. Department of Defense (Karim, 2004), a person can be easily located in an emergency. This can be done via a cellular telephone or a GPS tracking device. In Greece, GPS and web-based Geographic Information Systems (GIS) are used to monitor diagnostic data from hospitals in order to identify and respond to disease epidemics at early stages (Ptochos, et al., 2004). Other technologies, such as Radio Frequency Identification (RFID) have been used by government agencies to track livestock movements in the U.S. so that contagious diseases among cattle might be reduced (Gogan, Williams, and Fedorowicz, 2007).

In addition to government-provided services, cellular telecommunication companies also provide a wide variety of mobile location-based services, particularly in Asia. For example, in Taiwan, Cheng Sheng security and Chungwa Telecom (CHT) have cooperated to offer "MiniBond," a GPS service that provides location inquiry, emergency rescue services, and a

connection service with the security company. As a different example of GPS applications, Taiwan Cable Connection (TCC) offers an “828 portable gourmet” service providing mobile telephone customers with geographic information on the nearest gourmet restaurant with a simple dial of the number “828.” First International Telephone Company of Taiwan offers its version of the low-cost wireless Personal Handyphone System (PHS), featuring high-speed internet access, and location-based services: It is able to locate its mobile users within service zones by its “Location Tracking Service” – which may be useful for parents who wish to know where their teenage children are (Karim, 2004; also see Wall, 2007). Other services offered by various companies include location-based billing (where customers are charged different amounts based on where the mobile telephone is physically located when the call is made, Esson, 1999), notification services (where customers are notified when another mobile customer – e.g., the customer’s husband – enters a specific geographic range), localized severe weather or traffic alerts, information-based services (e.g., travelers can learn interesting facts about towns they are passing through while riding on a train), and commercial applications such as discount offers appearing on the cell phone screen when a user walks past particular restaurants (King, 2005; Renenger, 2002).

Along with the development of mobile communications technology and the popularity of a variety of services, industrial experts are planning to bring the current second generation (2G) mobile phone users into the third generation (3G) era, by adding functions that providers hope will satisfy both the customer and advertisers. In Asia, growth has been rapid. Mobile learning applications are used to supplement traditional and on-line learning by some university instructors and corporate trainers (Petrova, 2007). In Japan, six million people subscribe to mobile operator KDDI’s “EZ Navi” GPS-based service, which helps customers locate destinations (e.g., the closest flower shop) based on the location and type of business (Hanford, 2003).

Technically, positioning services tend to rely upon one of three types of technologies: First, Satellite Navigation Systems, Mobile Networks, and Local Positioning Systems. Satellite Navigation Systems such as the Global Positioning System (GPS), or the Global Navigation Satellite System (GLONASS) can track an object. These two systems determine the position of a receiver based on the time needed for transmitting signals between the satellite(s) and the receiver. Second, the positioning methods developed within mobile networks – including the Global System for Mobile Communications (GSM) and the Universal Mobile Telecommunication System (UMTS) – rely upon triangulation from various land-based cell phone towers. In the United States, these methods have been well-developed due to a directive by the Federal Communications Commission (FCC) that emergency personnel be able to physically locate cell phones (called E-911). Thus, all cell phones sold in the U.S. now have a geographic positioning function. Finally, local positioning systems are particularly useful for interior locations. Such systems use Infa-Red (IR), Radio Frequency Identification (RFID), or Wireless Local Area Networks (WLANs) as the basic technologies for the positioning function. For example, in a museum, tourists can use either a Personal Digital Assistant (PDA) or a mobile phone with WLAN connecting capabilities to receive detailed descriptions of the artifacts at each exhibition point (Khan, 2004).

Other than the E-911 directive, growth of geographic location services outside of Asia has, until recently, been comparatively slow (King, 2005). Even so, many observers predict that such services are poised for growth (Karim, 2004). GPS advocates argue that customers want cell phones with the capacity to download maps as well as the ability to give written and oral directions when driving toward their destinations (Thomas, 2006). Business customers may want such devices in order to facilitate other work (Sawyer and Tapia, 2006; Gilbert, 2007); for example, some firms may want to be able to track employees (e.g., truck drivers; traveling sales personnel). Mobile telephone companies increasingly see GPS as an economically viable feature that can raise

the price of handsets in the face of otherwise falling prices due to intense competition (McGrath, 2006). However, only recently, after significant marketing efforts, have large numbers of customers in the U.S. shown an interest in location-based services (Driscoll, 2006; Euromonitor International, 2008).

Concerns About Location-Based Services

The development of location-based services that are provided through cellular telephones or other portable devices raises several important policy issues that managers and researchers should consider as they seek to understand consumer behavior. Most technical limitations have been overcome through product reengineering (McGrath, 2006) and prices are falling (Miller, 2007). Thus, the issues are generally not technical or financial – they are psychological and ethical. The present paper considers three interrelated issues: “privacy,” “trust,” and “justice.” Socially-responsive corporate managers should address these issues for the following utilitarian reasons. First, such issues may account for the initial reluctance of some consumers to embrace location-based services. Firms must reassure customers about how location data are used. Second, inattention to such issues may lead to a breach of security. A security lapse, with accompanying publicity in the media and possible “negligence” lawsuits, may prove harmful to both sales and the financial stability of the firm. Third, unless the industry responds to these areas of consumer concern, it is likely that some form of government regulation will be imposed, which may prove onerous to service providers. Therefore, as these issues are examined, suggestions will be offered to mobile telecommunication managers based on existing research and theory.

Social scientists should also be keenly interested in exploring consumer behavior with regard to this new technology, because these issues have not been adequately addressed in the published research literature (Shugan, 2004; Barut *et al.*). In one of the few published studies

examining consumer acceptance of GPS systems, Kwon, Choi, and Kim (2007) report that “perceived sensitivity” (within specific contexts) was a significant predictor – suggesting that psychological and ethical issues related to privacy and trust are important. Additional, well-designed research studies might inform policy makers about these issues. The present paper explores these topics of privacy, trust, and justice and offers testable research propositions to guide future research in this emerging field of study.

Privacy

In order for location-based services to function properly, the location of the customer’s cellular telephone must be identified. However, this raises privacy concerns that mobile communication providers must consider.

The right to privacy has a long history. French philosopher, Jean Jacques Rousseau (1712 – 1778) proposed a theory of natural rights of people. He believed that people possess rights with which they are naturally born; they are not given these rights by someone else such as a government and they should never be deprived of them (Rousseau, 1762). To consumers in the U.S. and Europe, the ‘right to privacy’ is considered one of these basic rights; it is a right which has been legally established in numerous societies (for a fuller discussion of the development of the legal and philosophical concept of ‘privacy’ throughout history, see Kemp and Moore, 2007). While modern scholars (e.g., DeCew, 1997; Westin, 1968; Fried, 1968; Moore, 2003) differ on a precise definition of privacy, it is generally thought to encompass the following broad areas:

- The right to control information about one’s self (information privacy)
- The right to limit others’ access to a person’s presence, body, or property (physical privacy, property rights)
- The right to make decisions for oneself, without interference from others (decisional

privacy or autonomy rights)

Of these three areas, the concept of ‘information privacy’ warrants additional commentary (Moore, 2005). Generally, information privacy protects not only personal data about the persons, but any data that are transmitted or communicated, and it may even protect the communication event itself (e.g., information about who contacted whom as well as the setting and context of the communication).

Mobile telecommunication location features relate to each of these three types of privacy based on the way information is used. Cellular telephone location information is used by the positioning service software. The basic principle is to set up a location server on the telecommunication supplier’s central network to deal exclusively with the location request. When the location server receives a location request signal, it will verify the correct location of the client’s telephone through the positioning system of the telecommunication network and/or GPS satellite signals; it will then send a location response, including any desired information (e.g., the location of the nearest four-star hotel). Questions naturally arise as to how (and for how long) such data are stored in the system. Consumers may also wonder who has access to such information and for what purposes (Wright, 2005; Barut, *et al.*, 2006). For example, Smith (2006) asks whether the U.S. federal government can access information gathered by private wireless telephone companies – information that the government itself could probably not legally gather. Such issues are not exclusively legal in nature: for consumers, they are ethical and psychological concerns. Privacy concerns have been raised with other mobile telecommunications applications such as electronic banking (Choi et al., 2006). The more that customers have privacy concerns (e.g. because of issues raised in the media), the less likely they may be to use location-based services. An analysis of published news stories by “Privacy.org” over a six-month period revealed that “Unauthorized secondary use of information or data” was the leading category of privacy

abuse news story (Cockcroft, 2002). Customer demand for location-based services may be significantly impacted by such stories appearing in the news media. This leads to the first testable proposition:

Proposition #1a: The greater the consumer concern about information privacy, the less likely location-based services are to be adopted.

There have been cases where unscrupulous telephone company employees have used customer information for unauthorized, non-business-related reasons (e.g., Yehle, 1996). With the rise of location-based services, the risks of such misuse increase significantly. Because geographic information reveals where a telephone is physically located, it is possible that an unscrupulous mobile telecommunication employee might reveal that information to an associate who wishes to harm the telephone owner (e.g., if their physical location is known, the owner might be robbed when walking). Similarly, if the owner's physical location is combined with other information (e.g., the billing address), his or her house might be burglarized when it is known that the owner is away from home and using the location-based services. While much has been written about the use of GPS-based information to monitor criminal activity (e.g., Hein, 2006), its use by criminals has attracted less attention (for exceptions, see Andeman, 2007; Home Office, 2007).

Such crimes may be infrequent. However, as decision making studies reveal (for a brief summary, see Bazerman, 1994), people often overestimate the base rate of infrequent events. Thus, if potential customers believe that location-based services result in an increase in crime, then they may be reluctant to purchase such services. This leads to another testable proposition:

Proposition #1b: The greater the consumer concern about physical privacy, the less likely location-based services are to be adopted.

Finally, location-based services may indirectly impact decisional privacy (for a general discussion and legal analysis of decisional privacy issues see Kemp and Moore, 2007). If an employee travels to a large city and seeks the location of, say, a labor union organization, how can that person be confident that the information will not be revealed to the person's non-union employer who may then retaliate against the employee? Or suppose a man seeks to use marijuana for medicinal purposes and travels to a place where that is legally permitted. If the man uses his cellular telephone to search for an appropriate facility, will he have confidence that his information request will not be given to groups opposing the medical use of marijuana – or even given to law enforcement officials back in his city of residence, where it is not permitted? Will users of location-based services be deterred from making sensitive information requests, based, in part, upon the fear that someone might use that information to interfere with their private decisions? “Civil liberties issues” was the second-most frequently-offered theme of privacy-related news stories during a six-month period (Cockcroft, 2002). The greater the concern that such interference will occur, the less likely users may be to purchase such services and the greater the likelihood of government regulation. This leads to the following proposition:

Proposition #1c: The greater the consumer concern about decisional privacy, the less likely location-based services are to be adopted.

Trust

“Trust” is a multi-faceted term that can be defined as “the expectancy of positive (or nonnegative) outcomes that one can receive based on the expected action of another party in an interaction characterized by uncertainty” (Bhattacharya, Devinney, & Pillutla, 1998, p. 462). Trust may play a role in whether a customer purchases wireless telecommunication services (Wang, Lin, & Luam, 2006). Further, trust formation depends upon the communication medium

as well as upon content of the message itself (e.g., Ross, Chen, & Huang, 2007). As implied by the discussion of privacy issues, trust may be a critical issue for many consumers considering location-based services. However, the issue of trust extends beyond the concern of whether the service provider can be trusted to keep location information private.

Mayer, Davis, and Schoorman (1995) offer a model of trust that is particularly pertinent when exploring location-based services. Briefly, they propose that the decision maker (in this case, the consumer) considers whether the other (in this case, the service provider) is *trustworthy*. This interacts with the decision maker's *propensity to trust* to influence the *decision to trust*. This decision to trust interacts with the *perceived risk of the decision* to affect the dependent variable of *risk-taking behavior within the relationship*. In the context of location-based services, "risk-taking" refers to the adoption and use of such services.

Mayer, Davis, and Schoorman suggest that three characteristics of the person or organization promote trust by the decision maker; these are (1) ability, (2) benevolence, and (3) integrity. Each of these will now be considered.

Ability is rooted in competence, expertise, and power; it reflects someone's ability to do the decision maker good or harm. For location-based services, the consumer must decide whether employees at the companies operating these services have the ability to help or to injure them. Generally, it is anticipated that consumers will believe that employees at these services have the potential to do both. Thus, 'ability' is necessary but not sufficient to determine whether the service provider is trustworthy; benevolence and integrity must also be considered.

The authors define *Benevolence* as "the extent to which a trustee is believed to want to do good to the trustor, aside from an egocentric profit motive." (p. 718). For users of GPS-based systems, the question might be asked, "whose interests are the telecommunication companies serving?" If, for example, a customer searches for "gourmet" restaurants in the area, is the

customer getting a complete listing of the closest gourmet restaurants? Or is the customer getting a subset of the complete listing, based on who paid to be included in the database? Or is the customer getting a subset based on other criteria that serve the mobile carrier's interests (e.g., only owners who agreed to allow advertising for the wireless carrier in their restaurants are listed)? Many concerns over privacy and crime could be framed as questions of benevolence; obviously employees who provide data to criminals are, by definition, not benevolent toward the trusting customer. Similarly, effective customer relationship management (CRM) systems may be considered from a benevolence perspective as these are designed to enhance trust among active, repeat customers (Hulten, 2007). One goal of such CRM systems – which may include tailoring responses to queries based on the individual customer's past shopping habits – is for the firm to appear to be acting in the best interests of the consumer, based on their pattern of past purchases (Mitussis, O'Malley, and Patterson, 2006).

Integrity is a third component, based on the decision maker's belief that the other party "adheres to a set of principles that the trustor finds acceptable" (Mayer, Davis, and Schoorman, 1995, p. 719). Principles such as consistency between word and deed, a devotion to customer satisfaction, maintaining data security, and hiring honest employees may all enter into a potential customer's decision to do business with a particular company providing location-based services (N'Goala, 2007). Companies that reveal customer data to unauthorized persons will probably be seen as being low in integrity.

Ability, benevolence, and integrity comprise "factors of perceived trustworthiness." This term suggests that it is not the actual level of these factors that matters in the decision to trust and to take risks; rather, it is the perceived level of these factors on the part of the consumer. Mayer, Davis, and Schoorman further observe that integrity is "most salient early in the relationship prior to the development of meaningful benevolence data" (p. 722), but that perceived benevolence

becomes more important over time. Together, this information suggests the following testable propositions:

Proposition #2a: The greater the perceived (a) ability, (b) benevolence, and (c) integrity possessed by the location-based services provider and the mobile telecommunication provider, the more likely the consumer is to trust these providers.

*Proposition #2b: The less experience consumers have with a particular service provider, the more important that provider's **perceived integrity** will be for consumers as they decide whether to trust that provider.*

*Proposition #2c: The more experience consumers have with a service provider, the more important that provider's **perceived benevolence** will be for consumers as they decide whether to trust that provider.*

In addition to these factors, Mayer, Davis, & Schoorman, observe that there are individual differences in *propensity to trust*. Those high on this factor are inclined to trust others in the absence of significant information to the contrary. While this personality variable has received some attention within the marketing research literature (see Cowles, 1997), it has not been considered within the literature focusing on wireless telecommunication or location-based services – although the need for trust has been noted (e.g., Wang, Lin, & Luam, 2006). Yet, because location-based services have the potential to gather and disseminate private information, propensity to trust seems to be an important individual difference variable warranting research. The interaction between this variable and various situational factors (e.g., company reputation,

privacy safeguards) may identify boundary conditions on the relevance of propensity to trust for consumers. In the absence of such research, the following general proposition is offered:

Proposition #2d: In the absence of information to the contrary, the greater the consumer's propensity to trust, the more likely the consumer is to trust location-based service providers.

The decision to trust plays an important role in a person's decision to take a risk (in this context, purchase and use location-based services). However, risk-taking is also a function of the perceived risk of the behavior, independent of the other person. If a person believes that certain behaviors lead to undesirable consequences then the person will be reluctant to engage in those behaviors. For example, some employers implement electronic monitoring in the workplace so that employees mentally "revise upward" the probability that prohibited behaviors will lead to undesirable consequences, making those behaviors seem more risky (Chen and Ross, 2005). In an interesting study of a group of people who collect and cook wild mushrooms, Fine and Holyfield (1996) report that risk taking (eating wild mushrooms) is a function of both the perceived risk of the behavior (the group had developed guidelines to reduce the risk of selecting poisonous mushrooms) and the trust in which new members place in more experienced members.

While using GPS-based services may be less inherently risky than eating wild mushrooms, location-based services may seem risky to some mobile customers. At present, researchers do not know what factors heighten the risk. It seems reasonable to surmise that the following factors might heighten the perceived risk:

- publicity of data losses from telecommunication firms.
- personal experience with identity theft or with companies misplacing their records.
- stories of someone who suffered actual harm as a result of using location-based services (e.g., a traveler who was robbed because of an information security breach).

- the nature of the types of business sought using the service (e.g., locating a church building in a country where Christians are routinely discriminated against or even persecuted).

Thus, the perceived risk of using technology, including location-based services, will vary based on the context in which the services are used, the features of the technology, and the person's history as a consumer (Radin, Calkins, and Predmore, 2007). Regardless of the exact cause, if consumers perceive the use of such services to be risky, then they are less likely to use them. This leads to the following proposition:

Proposition #2e. The riskier the consumer perceives using location-based services, the less likely the consumer is to adopt mobile telecommunication-based location-based services.

Finally, while trust can be created (at least temporarily) by businesses without a well-formed sense of business ethics, businesses with an established and well-articulated code of business ethics appear to facilitate enduring customer trust in the firm (Bews and Rossouw, 2002). When combined with the previous discussion, this suggests the following proposition:

Proposition #2f. The more ethical the consumer perceives the company providing location-based services, the more likely the consumer is to (a) trust the firm, and to (b) adopt that firm's mobile telecommunication-based location-based services.

Justice

In addition to privacy and trust concerns, justice, or fairness issues also bear on the decision to use – or not use – location-based services. Justice is typically dichotomized into two broad forms: (1) *distributive justice*, reflecting the fairness of the outcomes, and (2) *procedural justice*,

reflecting the fairness of the means to determine those outcomes (Ambrose and Arnaud, 2005). Each of these will be briefly considered.

Distributive Justice

The fairness with which outcomes are allocated is an important issue for location-based services. While there are many possible outcomes, from a consumer's perspective, one outcome is of most relevance in this paper: Perceived satisfaction with the service. *Customer satisfaction* refers to the positive evaluation of a specific purchase, resulting from the quality of customer service a mobile telecommunications carrier provides (Kim, Park, and Jeong, 2004; Seth, Gupta, and Momaya, 2007; Fornell, 1992). Customer satisfaction may be anticipatory (prior to purchase), or retrospective (after purchase). Satisfaction is likely to shape whether one uses the service, how much one uses the service, loyalty to the company, and whether the customer recommends the service to others. Chebat and Slusarczyk (2005) observe that distributive justice influences customer loyalty through the mediator of such emotions.

One approach to evaluating location-based services is to use, in essence, a cost-benefit type of analysis. *Equity theory* (Adams, 1965), a widely-used theory of determining distributive justice, proposes that people compare their outcomes to their inputs. They also compare their ratio of outcomes-to-inputs to some other form of that ratio (such as their prior ratio or the ratio of another person). Equity theory suggests, and research confirms in other contexts (Rust, Thompson, and Hamilton, 2006), that many customers prefer to obtain greater outcomes (e.g., more mobile telephone options) for fewer inputs (e.g., lower costs) relative to what they previously enjoyed (Cox, 2001; Bolton and Lemon, 1999). Thus, getting a valuable location-based service for little or no extra cost is probably seen as fair by consumers. However, paying a great deal for a service that is not satisfactory and/or not used is seen as inequitable. Some evidence suggests that many

American consumers who receive one year of free GPS service with the purchase of a new automobile (e.g., General Motors' OnStar system) do not renew that service at the end of the year (Taylor, 2003). Reasons vary, but anecdotal evidence indicates that many consumers simply do not feel that the service is worth the additional monthly cost – which has led OnStar to add features such as “stolen vehicle slowdown” which allows OnStar officials to cut off the gasoline supply to a stolen automobile's engine (Righton, 2007). Thus, the following general testable proposition is offered:

Proposition #3a: The greater the perceived increase in outcomes (benefits), in the form of satisfactory location-based services for perceived inputs that remain the same or increase by a perceived smaller amount (i.e., costs), the fairer that customers will view location-based services .

To the extent that procedures and outcomes are standardized across location-based services, the firm seeks to treat all customers equally. The *Equality rule* of distributive justice suggests that many customers will view service-related outcomes as fair if every one is treated identically (Deutsch, 1975). Consumers may think that it is fair if everyone receives a highly-standardized outcome (e.g., everyone at the same location receives the same list of, say, “four-star Chinese restaurants”; everyone in a museum receives the same information about the same painting). Similarly, if fees are charged, customers may see a “flat fee” as fairer than a fee that varies across customers (e.g., based on GPS usage). Treating all customers identically is consistent with the equality rule (Sindhav, *et al.*, 2006) and suggests the following proposition:

Proposition #3b: The more that outcomes, in the form of satisfactory location-based services are identical across customers, the fairer that customers will view those services.

The third distributive justice rule is the *Need rule*. This rule refers to outcomes being distributed on the basis of need (Deutsch, 1975). In the context of location-based services, it may refer to obtaining services based on business need (Kau and Loh, 2006). A delivery driver may need GPS-based services more than an office worker. Similarly, one reason that the E911 rule has been accepted by consumers, even though it allows the government to locate a person, is that the citizen needs the assistance (e.g., an ambulance) provided by the government. Thus, “need” overrides privacy concerns connected with location-based service data, making E911 service seem fair. Even so, privacy experts caution that E911 creates information that might be used for less benign government surveillance and that such surveillance would probably be unacceptable to citizens (Smith, 2006). It may be seen as unethical because the gathering and use of such information violates this need-based rule. This suggests the following proposition:

Proposition #3c: The more that location-based services are available based on customer need, the fairer and more ethical that customers will view those services and any information sharing that supports those services.

Note that the three Distributive Justice rules (equity, equality, and need) are often in conflict, and both situational factors and individual difference variables may influence a preference for Distributive Justice standards (Deutsch, 1975). Therefore, it is probable that specific customers will endorse only one of the three standards of Distributive Justice in any given situation.

Procedural Justice

Procedural justice refers to the fairness of the processes by which outcomes are determined (see Cropanzano and Greenberg, 1997; Greenberg and Colquitt, 2005 for reviews). Procedural justice has been shown to influence customer satisfaction and trust with an organization’s products or

services (Teo and Lim, 2001; Sindhav, Holland, Rodie, Adidam, and Pol, 2006; Gultinan, 2006). Satisfaction may also be a significant forerunner of loyalty to telephone companies (Soderlund, 1998; Kim et al., 2004).

Leventhal and associates (Leventhal, 1976; Leventhal, 1980; Leventhal, Karuza, and Fry, 1980) identify several procedural justice rules; they propose that the greater that each of these rules is fulfilled, the fairer the procedure will be seen to be. Briefly, these refer to voice (having input in the decision-making process), ethicality (procedures that maintain not just legal standards, but professional, ethical standards), consistency, bias suppression, using accurate information as the basis for decisions, including representation by affected groups, and correctability (e.g., an appeals mechanism for unfair outcomes). These standards have been shown to be related to procedural justice. For example, ethical procedures generally are viewed more favorably than those that are not (Folger and Cropanzano, 1998). There is a growing body of literature suggesting that participant fairness judgments are linked with their evaluations of both telecommunication procedures (e.g., Chen, Ross, & Huang, 2007) and surveillance procedures in other contexts (e.g., Ambrose and Adler, 2000); therefore, it is not necessary to develop each of these rules into separate testable propositions here. It is sufficient to note that, in general, the more that a procedure satisfies the Leventhal criteria, the fairer the procedure appears to be. This leads to the following general proposition:

Proposition #4a: The more that procedures associated with location-based services appear to satisfy the Leventhal criteria of voice, ethicality, consistency, bias suppression, accuracy, representation, and correctability, the fairer and more ethical that customers will view those services and any information sharing that supports those services.

A different perspective on procedural justice suggests that people use procedural justice beliefs as a surrogate for determining whether they can trust the organization and accept its authority. Because procedural fairness beliefs act as a heuristic, or mental shortcut, for more complex trust judgments, this process is called the *procedural fairness heuristic* (Lind, 2001). Further, individuals place a special value on group memberships and associations that they make with organizations -- a fact known to marketing experts who sometimes ask customers to join “clubs,” “frequent flier programs” etc. or who create a store brand with high status so that customers will want to associate with that brand. Because cellular telephone companies typically ask customers to sign long-term contracts, this *group value* perspective on procedural justice seems relevant. As Tyler and Lind (1992) note, “Because procedures acquire substantial significance as symbols of group values, individuals are concerned as much or more with what happens within the procedure as whether the procedure promotes the attainment of some extra-procedural goal. Of key importance, according to this analysis, are the implications of the procedure for one’s relationship with the group or authority that enacts the procedure.” (p. 140). Thus, procedural fairness is important because if the procedures are fair, then the participant feels valued by the group, and is willing to accept the legitimacy of the authority implementing the procedure.

Tyler (1989) suggests that three evaluations are particularly important when participants evaluate procedures: (1) *neutrality*: whether the organizational authorities acted in an even-handed manner, (2) *benevolence*: whether the authorities acted in a helpful and trustworthy manner, and (3) *status recognition*: whether the authorities treated the participant as someone with appropriate status or “standing” within the group – a concept similar to what is sometimes called *interactional or interpersonal justice* (Bies and Shapiro, 1987; Greenberg, 1993), where a participant is treated with politeness, dignity, and respect. Evidence suggests that these specific

beliefs are important in procedural justice evaluations (Tyler, 1994), and that generally, the quality of a person's relationship with an organization is significantly related to whether that person feels that the organization has fair procedures (Tyler and Lind, 1992; Tyler, 1997). This suggests the following proposition:

Proposition #4b: The more that procedures associated with location-based services appear to satisfy the Tyler and Lind criteria of neutrality, benevolence, and status recognition, the fairer and more ethical that customers will view those services.

Turning to the specific topic of information sharing between telecommunication companies and location service providers, U.S. law remains unsettled and company procedures vary. Section 222 of the U.S. Telecommunications Act of 1996, as amended, specifies that telecommunication carriers have a duty to protect the confidentiality of "Customer Proprietary Network Information" (CPNI). CPNI includes: (a) Information pertaining to the quantity, destination, type, and amount of use of a telecommunication service by a customer, as well as (b) Information contained in bills that is pertaining to telephone service – except information necessary to publish telephone directories (Casal, 2003; Edmundson, 2005). Such information – including geographic information – is potentially valuable to telecommunication firms, for they might sell customer lists to other firms, or in exchange for providing customer demographic information to third party "data mining" firms, gain names and contact information for thousands of other potential customers who are demographically similar to the typical current wireless customer (Coster, 2006). Data mining is a practice that raises numerous ethical concerns apart from the issues raised in the present paper (Danna and Gandy, 2002).

Therefore, federal law requires customer approval before a telecommunication firm can distribute CPNI information to third parties. When the Telecommunications Act of 1996 was

passed, the U.S. Federal Communications Commission (FCC) adopted a requirement that customers must give their express consent before telecommunication carriers could share information; this is called an *Opt-in* procedure. However, after a court challenge, the Tenth Circuit Court of Appeals reduced this requirement to an *Opt-out* procedure whereby a consumer must express to the carrier that he or she did not want information shared (Karim, 2004). Within these two broad procedural options, numerous variations exist. For example, Qwest Communications has received criticism for including an Opt-out notice as a flyer with routine monthly billing statements (rather than a separate, personalized letter); privacy advocates argue that notices contained in billing statements are unlikely to be read by consumers (Bischoff, 2002); impersonal notices may also suggest a lack of status recognition. Concerns have been raised in Congress about some information-sharing arrangements between firms as well as how some individuals and information-brokerage firms allegedly use deceitful methods (e.g., by impersonating a customer, a method called ‘pretexting’) to obtain information. Consequently, the FCC has again adopted an Opt-in procedure (Silva, 2007). It is unclear whether this new procedure will withstand a court challenge.

The U.S. Congress has also passed the Wireless Communications and Public Safety Act of 1999 (WCPSA), adding ‘location’ information to the CPNI and expressly requiring an Opt-in procedure when this type of data is shared with third parties. Thus, at present, the FCC has embraced the Opt-in procedure for all types of CPNI data. However, the law does not prevent wireless firms from collecting and using such information internally, to the concern of some privacy advocates (Smith, 2006).

These events highlight the importance of procedural fairness and trust in the realm of privacy protection. The same general fairness principles described earlier are obviously relevant when one is considering procedures to protect customer privacy. They may be even more relevant

for privacy-related procedures because the consequences of poorly-designed or poorly-enacted procedures may be great for consumers (e.g., identity theft, robbery). Many consumers may find it repugnant that a telecommunications firm could, without their knowledge or express consent make money by selling the information that the customer has entrusted to the firm (raising informational privacy issues). Issues of benevolence (which is relevant to both trust and procedural fairness) and corporate integrity are also raised by such actions. Scott (2004) proposes that procedural issues, couched in “control mechanism” terminology influence trust and uncertainty beliefs, which in turn, influence the perceived risks associated with e-business for managers. Given the frequent coverage of identity theft issues in the news media (Milne, 2003), individual consumers may be particularly sensitive to procedural justice as it relates to privacy issues. Such logic suggests a final set of hypotheses:

Proposition #5a: Customers will have stronger, negative reactions to violations of procedural fairness if they believe that their privacy has been violated than if they do not believe this.

Proposition #5b: Customers who report having seen or read more news items about information-related crime (e.g., identity theft) will be more likely to have strong negative reactions to procedural justice violations than those who have little knowledge of such crime.

Conclusion

The growth of location-based services raises numerous issues of interest to scholars, managers, and consumers. While such services have shown growth in Asia, consumers in the United States have been slower to embrace such services. In the present paper, it is proposed that telecommunication firms must address issues of privacy, trust, and justice if they hope to win business and consumer satisfaction. Such psychological factors affect whether the

telecommunication firm and the location-based service provider are seen as operating ethically. These considerations provide the (sometimes unspoken) rationale for some recent technological proposals such as allowing mobile handset users to have variable control over the extent to which their location is disclosed (e.g., how exact one's location is; identifying specific geographical areas where one allows oneself to be monitored), and by whom (for discussion, see Bessler, 2007; Wright, 2005). Privacy, trust, and justice considerations also provide the basis for voluntary wireless standards (e.g., Smith, 2007) and legislation, such as a French rule that prohibits employers from using GPS monitoring of employees when they are on their lunch break and prohibiting the storage of most location-based data for more than two months (Gilbert, 2007).

The present paper also offers testable propositions based on these factors. By gathering empirical data, social scientists may determine the extent to which models developed in other contexts (e.g., the Mayer, Davis, and Schoorman, 1995 model of trust) generalize to consumer behavior in the present context. By gathering empirical data, researchers may also be able to determine the relative effects of privacy, trust, and justice on consumer attitudes and behavior. For example, Aurier and Siadou-Martin (2007) demonstrate that justice beliefs substantially impact customer trust in restaurants, but show modest direct effects on customer satisfaction.

Research may also identify limiting parameters. For example, location-based services that are unique to specific locations (e.g., RFID-based information services found within a museum) may be less affected by privacy, trust, and justice considerations than more generalized GPS-based services. Location-based monitoring may be tolerated more in certain occupations (e.g., truck drivers), or under certain conditions (e.g., trucks had been stolen in the past). Research in this area might clarify these relationships. How information about these three factors is presented may also play a significant role in consumer behavior (Shaver, 2003). Finally, after gathering empirical data,

it should be possible to construct theoretical models explicating the relationships among the variables relevant to location-based services.

The potential market for geographic-based services in the U.S. and Europe is huge. However, the risks due to adverse publicity from ethical lapses or neglect (i.e., the misuse of data) are also large (Gilbert, 2007). By deliberately considering the factors of justice, privacy, and trust when developing policies, firms may be able to avoid significant mistakes – particularly if policies are based on research evidence. Therefore, researchers should investigate the testable propositions described here in order to better inform practice.

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