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The Impact of Technology on Relationships within Organizations

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Abstract. While much research has been undertaken to examine how technology impacts individuals and groups in organizations, as well as how it impacts organizations in their entirety, attention has not been directed at how technology impacts the relationships between these different levels in an organization—individual, group, and organization-wide. This paper seeks to address this void. Specifically, a grounded theory approach is used to begin development of a theory for how technology impacts these relationships. Based on a semi-structured survey, the resultant model is presented. Eight technology variables are identified in the model as responsible for impacting the relationships between the different levels of an organization. As a first foray into this area, the findings in this paper can serve as the foundation for further theory development and empirical testing.

Keywords: organization theory, organizational relationships, technology, communication

The impact of technological innovation on organizational performance has been of interest to researchers since Trist and Bamforth's [42] studies in British coal mines led to the development of sociotechnical theory. In the subsequent half-century, many researchers have studied the interaction of social and technical aspects of organizations and the effects of such interactions on organizational performance. Research has emphasized individual, group or organizational behavior, and it has recognized the ability of technology to assist in reengineering work patterns, building electronic coalitions internally and externally, and disseminating information throughout the organization. However, there has been little or no work on how technological innovation impacts the relationships among levels in an organization specifically among individuals, groups, and the organization itself. Further, the constant evolution of technology suggests that the impacts of technology will continue to transform organizations in new and profound ways that have yet to be identified [28].

In studying the role of technology on organizational performance, classical theory provides an interesting starting point. Because of the rapid and potent nature of technological advancement, the possibility of uprooting long-held beliefs about organizations exists. Child and Faulkner [5] show technology influences organizational alliances, power within an organization, and the development of virtual organizations. Moreover, Katz and Kahn [22] suggest that technology may inhibit individual autonomy, which counters

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the 1960s movement emphasizing small group activity [6]. Rice and Bair [33] argue that electronic communication media enhance organizational productivity. Clearly, these far reaching impacts of technology indicate the potential for technology to alter classically held beliefs about organizations. Pursuant to challenging classical theory, how technology is influencing the relationship between (a) individuals and the organization in its entirety and (b) individuals and the groups to which they belong can be studied within the context of newly developed theories (or within the context of reinforced classical notions should the research show that classical theory is upheld).

Past work has emphasized the impact of technology on individuals, and occasionally groups, each within organizations. This research is distinct in that it seeks to study all levels within organizations, specifically the individual, groups, and the organization, and how relationships among the levels are impacted by technology. As technology changes, the relationships change between social and technical subsystems of the organization. As a result, the individual-organization and individual-group relationships within an organization also change. These relationships must be understood in order to optimize organizational performance. This research will identify key variables that impact the dependent variable, defined in this paper as *the nature of relationships among the different levels of the organization*. In the current phase of this research, we examine one-way relationships from the respondent (or his/her group) to the group or organization level. The identified key variables will enable better management of technology because they identify the critical ways in which technology impacts the relationships among the levels of the organization. This dependent variable is comprised of two components: (1) the attitude or feelings about the relationship between one level and another, and (2) the strength of the relationship between one level and another. The attitude between one level and another can be positive, negative, or ambivalent. The strength between one level and another can be strong or weak. The core questions that this research seeks to answer are:

1. What is the effect of innovations in information technology on relationships among the various levels of organizations?
2. What are the key variables that are responsible for impacting the relationships among the various levels of organizations?

Because of technology's dramatic impact on organizations today, the development of organizational theory that addresses these impacts is at a stage where empirical testing is premature, requiring qualitative, grounded study to answer the research questions posed above [7,30]. Only after new variables and theories are postulated can empirical testing be undertaken.

This paper makes several contributions. First, the paper generates a grounded understanding of how information technology is affecting the relationships among the individual, groups, and organization-wide levels within organizations. The presented theory is empirically valid because collected data were integral to the theory-building process [4,12]. This approach suggests that the resultant theory is likely to be consistent with empirical observation [12]. Building theory from field data is particularly important for

research in information systems because of the applied nature of the field, the rapid pace of change in the field, and the widening gap between theory and practice [25]. One caveat, noted in the study description, is that field data were collected from students. Second, the grounded theory developed in this paper contributes to our understanding of how existing organizational theory handles recent technological innovation. Third, developments in this paper are discussed within the context of classical organization theory, developing a more general framework for explaining changes in the individual-organization and individual-group relationships associated with innovations in information technology.

1. Related work

There have been a series of studies that suggest technological innovation has led to the emergence of new organizational forms [34,39]. This line of research has been extended to consider the impact of these new organizational forms, particularly the network organization, on the various levels of an organization. For example, Turkle [43] examines the impact of technology on individuals, Nohria and Eccles [29] argue that relationships between individuals are hindered by communication technologies because not all social cues are transmitted, and Goodman [18] and Symon [39] note that technology can strengthen the role of individuals in organizations. At the group level, Rice and Steinfield [34] report on cross-functional project teams and Robey et al. [35] reports on the reorganization of work around virtual teams. Heavens and Child [20] used case studies to examine the role of teams in bridging individual and organizational learning.

This literature differs from our research in an important way. Existing work looks at the impacts of technology on different levels of an organization. However, it does not examine how technology impacts relationships between levels in an organization (e.g., the individual-organization or individual-group relationship). Thus, theory exists for describing how the levels themselves are changing, but not how they inter-relate. Therefore, while this research is related to existing work, it seeks to examine a fundamentally different question. An exception is Symon's [39] work, which notes that temporary team projects consisting of both permanent and temporary employees are becoming more common. This impacts how individuals relate to the organization for which they work [16]. This idea lays the groundwork for the research presented herein because it appears that the relationship between individuals and groups may be getting weaker, but at this point such an idea is only speculation.

The foundations for this area of research come from a number of related literatures including sociotechnical theory (e.g., [14]) and work practice research (e.g., [2,8]), studies of culture (e.g., [3,15,32]) and trust (e.g., [20,45]) in organizations, and social ties (e.g., [19,23]). Sociotechnical theory and work practice research examine how technology impacts the way people conduct their work. This literature informs our research because we are looking at the effect of technology on relationships in the workplace as noted above. Studies of culture and trust focus on how people, groups, and organizations behave through predefined norms and values. New technologies influence, and are influenced

by, organizational culture and trust. Thus, this literature is relevant to our work in that we are exploring the effects of technology's impact on work and thus the culture and ensuing trust that exist in the workplace. Lastly is the social ties literature. By definition, social ties are the relationships between individuals, groups, or organizations. The social ties literature studies how people communicate and how the characteristics of social ties influence communication. This is important for our work because we are looking at how social ties are impacted by technology.

2. Methodology

Qualitative methods have been used for individual, group, and organization levels of analysis as well as entire industries and societies [44]. The lack of existing work in the area reported here suggests that qualitative methods are most appropriate for this research [7] because qualitative methods are appropriate when description, concept development, and hypothesis generation are more important than hypothesis testing [24]. In particular, the relevant variables for both organizational transformation and evaluating the impact between the different levels in an organization must be identified before empirical research can be undertaken.

The specific qualitative methodology followed in this research is that of grounded theory [12,17,26]. Grounded theory has previously been applied to organizational research (e.g., [1,13,21,30,31]). The primary reasons why grounded theory was followed in this research are as follows:

1. Grounded theory is a generative approach to theory development that is particularly applicable to this research because there is no existent theory to explain how the organizational transformation brought about by innovations in information technology impacts the individual-organization and individual-group relationships within an organization. There is research that examines the individual levels of organizations (e.g., [29,39,43]), but not how the levels relate to each other.
2. A major aim of grounded theory is to produce accurate and useful results by "grounding" the theory in empirical observations or data. This directly addresses the recent push by IS researchers to better wed theory and practice to ensure that research is useful in practice [4,30].

2.1. The study

Data were collected from an open-ended survey of 120 sophomores and juniors at Georgetown University. The survey was completed as part of a regular classroom exercise, and the survey questions are included in the Appendix. Of importance in this context is a clear distinction between the individual, groups, and the organization with a combination of permanent and temporary groups to provide a full range of data. As detailed in Glaser and

Strauss [17], coding of data continued until the data were saturated. To reach data saturation, 72 randomly selected surveys were used of the 120 obtained. Of the surveys used, female respondents represented 40% and males 60%. The ethnicity of the sample was: 63% Caucasian, 22% Asian/Asian-American, 6% Hispanic, and 3% African-American, with 6% not reporting ethnicity.

Data collection focused on topics of technology and work groups, and sought information on how technology impacts individual and group feelings towards work groups and the organization in its entirety. Result validity was improved by asking the same question different ways. Also, the survey design specifically excluded words that might bias the participants such as "relationship," "personal," or "social tie."

The communication technologies included in the study were: e-mail, Blackboard course management software, network shared drives, static websites, dynamic websites, and telephone. Also, an "other" category was included, and some respondents added instant messaging. Additionally, data on face-to-face contacts were collected. We only included existing technologies since we cannot make predictions about what will happen in the future [39].

2.2. Data analysis

Because a grounded theory approach to theory development was used in this work, an inductive method, in which a developing theory is based upon collected data, was used to analyze respondent data in this study. That is, rather than classify data according to existing categories, emergent categories developed during the iterations between coding and analysis of the data. Coding involved review of the data and grouping similar concepts by topic. The constant comparative method [17] was used to analyze the topics and consolidate them into categories. This method allows for the continual updating and changing of categories as additional data are reviewed. The constant comparative method is considered more effective for theory generation than the use of preexisting categories because emergent categories are more relevant and better fitted to the data [17,30].

The development of emergent categories suggested by the data is known as open coding [38], and is a form of content analysis. Per Glaser and Strauss [17], coding of data continued until no new concepts were emerging and the data were considered saturated. During data coding, concepts were organized along themes, and these themes became candidates for categories [38]. As category development progressed, both open and axial coding were used, with connections between the categories made via axial coding as categories were established [37]. It should be noted here that the focus of data coding was on the development of concepts, properties, and relations [30].

After several coding iterations, and the use of two coders, whose agreement increases validity [24,36], the themes developed were combined into eight categories. Because all of the data, except for those considered "off-topic," are covered by the eight categories, we are confident the categories adequately represent the data collected in the

study. The descriptive term that we applied to each category serves as a key variable (i.e., factor) in the model. During the process of identifying these variables, we discern several interesting trends that we develop into formal observations.

3. Results

The main purpose of this research is to identify the key variables that impact the individual-organization and individual-group relationships that exist within an organization, and thus our primary contribution is a model illustrating what these variables are and how they may impact these relationships. We are able to comment on some specific observations about *how* the relationships are impacted by the variables, but that is not the primary focus of this paper, and the validation and extension of these observations are left for future work.

3.1. The model structure

As illustrated in figure 1, the variables that influence relationships are driven by two sets of factors—performance and human. The performance factors emphasize the *technologies* employed for communication among the levels of the organization, and the human factors emphasize the *people* involved in communication among the levels of the organization. The human factors are further divided into unifying and distinguishing categories. We propose that these factors be thought of in general as binary variables where the presence of a variable enhances the relationship and the absence hinders the relationship (but in some cases as noted below the absence does not impact the relationship). The concepts that comprise the model are discussed below, and an explanation of how they fit within the existing literature is provided where appropriate.

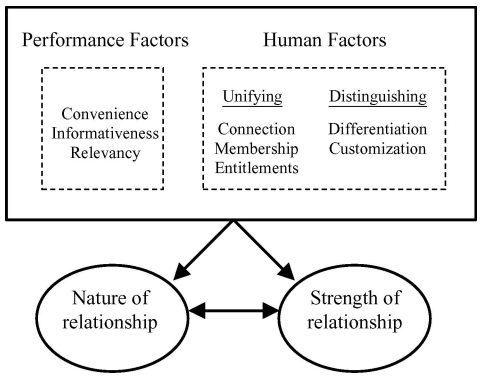

Figure 1. Technological influences on the relationships between levels in an organization.

3.1.1. Performance factors

Convenience. Convenience describes the degree to which technology *makes communication easier* between individuals and their groups or individuals and the organization, requiring less effort. This concept encompasses issues such as ease of contacting others in the organization, timeliness of communication, search and retrieval of relevant documents, and technology functioning. Comments by respondents that are classified under Convenience include positive responses such as "easier to use," "can access needed information when I want," and "faster than having to call or go in person." Comments suggesting a lack of convenience include "immediate help is limited" and "not user friendly."

The Convenience category describes a concept similar to one presented in the technology acceptance literature, "perceived ease of use" [9], where perceived ease of use is "the degree to which a person believes that using a particular system would be free of effort" [9, p. 320]. Convenience differs in that it does not imply complete freedom from effort, but rather "less effort" when compared to other means for achieving the same goal. Also, while the "perceived ease of use" concept is similar, the context in which it is applied differs because we are examining how convenience of technologies impacts relationships in organizations whereas the technology adoption literature considers the adoption process of new technologies.

Informativeness. Informativeness refers to the degree to which technology is *capable* of providing the desired information. Positive response examples include "keeps me up to date" and "[provides a] common source of information." Negative response examples include "info[rmation] is unavailable" and "outdated info[rmation] so [I] don't bother checking."

Like Convenience, Informativeness is somewhat aligned with previous work on technology acceptance—perceived usefulness [9]. However, while Informativeness emphasizes the ability to obtain desired information, "perceived usefulness" refers to the ability to obtain desired information in order to enhance job performance. Thus, our concept is somewhat less restrictive in that we do not focus specifically on job performance, but again on how technologies already in use impact organizational relationships.

Relevancy. Relevancy refers to the degree to which a technology is *pertinent* to the relationships among the various organizational levels—individual, group, and organization-wide. The marketing literature employs a similar concept of relevancy where relevancy is defined as related to the matter of concern. For example, Moenaert and Souder [27] identify relevancy as a factor that influences the ability of a message to convey information. We look at relevancy as a factor that influences the ability of a technology to impact a relationship. That is, for example, some technologies influence the relationship of the individual to the organization and others simply have nothing to do with the individual-organization relationship. Relevancy comments tend to emphasize that a particular technology is not relevant for that relationship, which is neither positive nor negative. Examples of comments categorized under relevancy include "it's useful but

doesn't make me think of community," "just for specific classes," and "it's an individual thing."

3.1.2. Human factors

The human factors have been categorized as either "Unifying" or "Distinguishing" to capture the range of human factors that can impact the various relationships. Unifying refers to the degree to which individuals relate to either their groups or the organization as a result of consistency, or sameness, across the organization. In contrast, Distinguishing refers to the degree to which the individuality of the individual, groups, and organization is recognized.

Connection. Connection refers to the degree to which a technology *causes* individuals to feel linked to either groups or the organization. This concept encompasses such issues as interaction with individuals in groups and in the organization, access to resources and information, and updates about groups and the organization. Respondent comments indicate both a sense of connection as well as a lack of connection. Connection is indicated by "it connects you to the network, no matter where you are" and "connected to professors and classmates." In contrast, a lack of connection is signaled by respondent comments such as "isolation from actual person" and "the info[rmation] is not connected to Georgetown."

Membership. Membership describes the degree to which technology *prompts* individuals to feel a part of their groups and the organization. This is a different type of bond than that described for Connection. Rather than serving as a link between the individual and the group or organization (Connection), Membership focuses on the individual as part of the group or organization. This concept encompasses the restrictive nature of access to technologies and commonalities among members of the organization reinforced by technology. Examples of comments that indicate respondents feel a sense of membership include "everyone's address is very similar (@georgetown.edu) . . . only Georgetown registered people can use it," "always feel part of [GU community] because [technologies] are only accessible with student net ID," and "It's a Georgetown-specific address book; non GU users are excluded." The majority of comments indicating respondents do not feel a sense of membership focus on insufficient exclusivity: "accessible to anyone" and "available to everyone, for everyone—not just GU community."

Membership is similar in concept to that of "identification" introduced by Dutton and Dukerich [10] and Dutton et al. [11]. Identification describes how individuals identify with their organization. We generalize the concept to consider relationships beyond the individual-organizational relationship to include relationships among all levels of the organization. Also, we consider membership specifically in terms of how technology influences a sense of membership. Dutton and Dukerich [10] and Dutton et al. [11] emphasize member perceptions in general.

Entitlement. Entitlement is the degree to which individuals *feel they have a right* to something because of their relationship to a group or to the organization. Specifically,

entitlement refers to individuals' rights to fair and equal access to technology and organizational and group resources when compared with all other members. Examples of respondent comments that are classified as Entitlements include "everyone on campus can access the same stuff," "sharing the same information is nice, feels less competitive," and "Everyone can have access to the same material so I don't feel at a disadvantage."

Differentiation. Differentiation emphasizes the recognition of individuals as *unique and special* (rather than faceless, substitutable parts of the organization or a group). The term differentiation comes directly from the literature [40,41], where Tajfel explains differentiation as distinguishing oneself from others or ones group from other groups. For our work, this concept describes the degree to which technologies enable individuals to be recognized as important and treated as unique. Many of the comments provided by respondents were simply "personal" or "impersonal" from which little meaning can be gleaned. However, related comments to "impersonal" were provided such as "I might as well be talking to a machine," "broadcast e-mails aren't personable," and "sometimes you feel like just a number." Comments by respondents indicate that Differentiation is achieved when the technology can capture information about specific parts of the organization to which the individual is intimately involved, access is restricted to "special" individuals, and a sense of caring for the individual emerges. Examples include: "feel like you're not just a name in a computer/on paper—you're real," "special, distinct from rest," "feel special because of restricted access," and "creates personal interaction."

Customization. Customization is similar to Differentiation, except with the *focus on the organization or group* rather than the individual. Specifically, Customization refers to the degree to which technologies are tailored to the needs of the organization [group]. That is, does the technology contribute to distinguishing the organization [group] from others? Respondents focused on the fact that technologies are customized to the organization's [group's] needs or addresses organizational [group] issues. Examples are "it is specifically for Georgetown so I feel somewhat connected to the University" and "customized specifically for GU's needs." Cases where respondents do not feel a sense of customization are given by "many schools use it—very standardized" and "you can use the phone to contact anyone, not just Georgetown."

3.2. Observations

The model depicted in figure 1 identifies a series of eight variables that influence both the strength (weak or strong) and attitude (positive or negative) of the relationships between the various levels of an organization, particularly, the individual-organization relationship and the individual-group relationship. In general, affirmative values for the variables lead to a strong and/or positive relationship while non-affirmative values lead to a weak and/or negative relationship. We can distinguish between how the variables enhance or inhibit relationships because the semi-structured survey instrument used for data collection asked for each separately. It should be noted here that the "organization"

refers to either the organization as a whole or individuals who serve as representatives of the organization. This definition is based on how respondents answered questions where we asked specifically about the organization.

As a theory development paper, we expected the presentation of the key variables to serve as our research contribution. However, during the process of identifying the variables, we noted interesting patterns that enable us to provide an additional contribution in the form of observations. The observations are presented and then elaborated upon in the paragraphs that follow, with related observations presented consecutively (Observations 1 and 2, Observations 3 through 7). The majority of observations apply to both individual-organization and individual-group relationships as noted in each observation.

The observations do not comment on the relative importance of each factor for impacting the relationship. Further work is necessary regarding *how*, and *to what extent*, the factors impact the individual-organization and individual-group relationships. We can provide several insights based on the responses from our current study.

Observation 1. Technology that facilitates easy communications among members strengthens the individual's feelings toward the organization and groups to which the individual belongs (Convenience).

Technology removes barriers to developing and maintaining individual-organization and individual-group relationships because individuals are more comfortable contacting representatives of the organization and group members respectively. Also, individuals can more easily and more frequently communicate with representatives of the organization and group members. In this sense, all of the technologies, other than the telephone, facilitate greater strength in individual-organization and individual-group relationships than does non-technology-mediated communication. This observation holds equally for both the individual-organization and individual-group relationship.

Observation 2. Technology that inhibits easy communication weakens the relationship between the individual and the organization as well as the relationship between the individual and groups to which the individual belongs (Convenience).

The reverse of Observation 1 also holds for both individual-organization and individual-group relationships. Technology that creates barriers (real or perceived) to communication are considered inconvenient and hurt individual-organization and individual-group relationships. Respondents noted inconvenience was relevant for technology-mediated communication as well as face-to-face communication. Inconvenience for face-to-face communication may involve difficulties arranging a meeting time, and inconvenience for e-mail communication may involve technical difficulties with the system. Although convenience was not explicitly noted by respondents for face-to-face communication, inconvenience was, suggesting that although technology and non-technology mediated communication can be hindered by inconvenience, technologies can better compensate through the added conveniences they provide. Survey

comments addressed both the individual-organization and individual-group relationships at approximately the same rate.

Observation 3. Individuals feel stronger ties to the organization and groups to which they belong as more people use the same technology, up to a point (Membership, Differentiation).

In addition to the membership and differentiation variables, this observation draws on the more general Unifying and Distinguishing constructs that classify the human variables in the model. The human variables that emerged from this study indicate a continuum in which individuals tend to feel more strongly a part of the organization as they perceive that an increasing number of people in the organization are using the same technology that they are using for communicating. However, at some point there is a switch in sentiment where the notion of "more people are better" becomes "too many people." Once this threshold is reached (wherever it is) too many people using the same means of communication leads individuals to feel less a part of the organization. This is because individuals start to feel less important as individuals. Observations 4 through 7 follow from this observation and expand on some of the concepts.

Respondent comments such as "everyone uses the same," everyone's address is very similar (@georgetown.edu)," and "you're in it together" indicate a positive sense of membership engendered when individuals feel part of a homogenous group or organization. At the same time, responses such as "just a number," "not special," and "mass e-mails" suggest that at some point individuality is degraded to the point that relationships become weaker and more negative then when a sense of differentiation is maintained. This observation holds for both the individual-organization and individual-group relationships, but there are more data that correspond to the individual-organization relationship than the individual-group relationship.

Observation 4. Technology that generates feelings of exclusivity for members promotes strong, positive relationships between the individual and the organization and the individual and any groups to which the individual belongs (Membership).

This observation captures individuals' desires not only to feel part of a homogeneous group or organization, but for the same attributes that create a sense of homogeneity among group or organization members to distinguish them from other groups or organizations. When technology is effective at creating a clear boundary between the organization and its environment, individuals within the organization feel very closely tied to the organization because they perceive themselves as "insiders." The opposite is observed when technology is not effective at creating a clear boundary. Thus, we believe that technologies that define a sense of membership tend to result in stronger, more positive relationships between individuals and the organization than technologies that do not. Respondents who felt a sense of membership made comments relating to the fact that technologies were only accessible to members of the organization (e.g., passwords)

and that all members of the organization use the same technologies and have similar phone numbers and e-mail addresses. Features of technologies that result in individuals feeling less of a sense of membership include technologies that are easy for "outsiders" to access or that allow for exclusive groups within the organization. This observation is supported equally by the data for both the individual-organization and individual-group relationships.

Observation 5. Technology that engenders a sense of exclusion by some members of the organization weakens the relationship between the individual and the organization and makes the relationship less positive/more negative than when technology does not create the perception of exclusion. (Connection, Entitlements, Membership, Differentiation).

For individual-organization relationships, Observation 5 is a follow-on to Observation 4. Just as perceiving oneself on the inside of the boundary between the organization and its environment strengthened and makes more positive the individual-organization relationship, individuals who are technically part of the organization but feel excluded—on or outside the organization boundary—feel weaker, less positive ties to the organization. It should be noted that we use both the descriptors more negative and less positive because they describe different attitudes. For example, one may not like telephones as much as email (less positive), but that does not mean he does not like phones at all (negative).

All of the technologies included in this study—e-mail, Blackboard, network shared drives, websites (static and dynamic), and instant messaging—except for the telephone tend to promote the perception of inclusiveness by the organization. That is, respondents repeatedly noted that such technologies help them to feel part of the organization because everyone has access to the same technologies and information. The telephone emerged as the notable exception to this tendency. Some respondents noted they did not feel part of the community when either communicating via telephone or face-to-face in situations where they felt uncomfortable, socially snubbed, or left "out of the loop" by others. This observation suggests a relationship exists between Entitlements and Membership since technology appears to weaken the individual-organization relationship by causing individuals to feel less of a sense of membership when the means of communication does not create a fair, homogeneous environment. This observation also suggests that personality, which was not examined in this study, may affect how technologies impact the individual-organization relationship because certain personality types may be more comfortable with electronic communication media than others.

One respondent commented that he does not feel like part of the organization when interacting with dynamic websites because he feels "isolation from [the] actual person dealing with [an] issue or information." Other respondents noted that "Sometimes it doesn't feel as though I'm included in all [e-mail]" and that one does not feel part of the organization when accessing the business school's network shared drive

because "the [business school] is separate from [the rest of the university]." This observation identifies a relationship between Differentiation and Connection where individuals feel less connected to the organization when the technology used for communication is impersonal and a relationship between Membership and Connection where individuals feel less connected to the organization when technology is exclusive to the point that an individual feels left out. This observation applies to the individual-organization relationship.

Observation 6. Too much homogeneity generated by technology weakens the relationship between both the individual and the organization and the individual and any groups to which the individual belongs (Differentiation, Connection).

This observation expands on the "up to a point" concept identified in Observation 3. Interestingly, the sense of homogeneity engendered by technologies and touted in previous observations as improving individual-organization and individual-group relationships can hinder the relationships under certain circumstances. The minimization of differences between individuals can result in people feeling unimportant and only weakly tied (typically in the negative direction) to the organization or group. For example, mass mailings and feeling like "just a number" results in individuals believing that they are not special and are thus less satisfied with their relationship to the organization. This observation suggests a relationship between Differentiation and Connection where a lack of differentiation, e.g., technologies are perceived as "impersonal" or "not special," tend to result in individuals feeling less connected to the organization or groups to which individuals belong. While this observation holds for both the individual-organization and individual-group relationships, it is more pronounced for the individual-organization relationship.

Observation 7. Feelings of fairness generated by technology promote strong, positive relationships between the individual and the organization and the individual and groups to which the individual belongs (Membership, Entitlement).

When a sense of fairness and equity is created by a technology, individuals tend to feel more positive about their relationship to the organization. Respondents commented that they felt certain technologies introduced more fairness to the organization because they provide everyone with equal access to resources and ensure that access is provided on a first-come-first-serve basis. Also, subjectivity is removed from decision making to some extent when certain technologies (e.g., dynamic websites) are employed. While this observation is supported by data for both the individual-organization and individual-group relationships, this observation is more strongly supported by the individual-organization data, possibly because more individuals are vying for limited resources in the organization as a whole than in smaller groups.

Observation 8. Technologies that facilitate constant communications and information linkages promote strong, positive relationships between the individual and the organization and the individual and the group (Connection, Informativeness).

Technologies that facilitate a linkage with the organization tend to result in individuals feeling both positive and strong about their relationship with the organization. Responses to our survey that support this observation were provided by individuals who reported feeling closer to others in the organization, feeling connected to the organization at all times, and being happy to be updated about the organization when communicating via technology. A respondent noted feeling connected to the organization when using e-mail because it keeps him "connected to others at GU." Another said he feels part of the organization when he accesses websites because they provide "information on events and happenings around campus." This observation holds for both the individual-organization and individual-group relationships, but it is more pronounced for the individual-organization relationship. The technologies for which this observation most clearly holds are e-mail, phone, and shared drive with comments such as "keeps connected from off campus," "talk to all GU friends," and "connected to network no matter where you are," respectively.

Observation 9. Technology that draws positive attention to the organization strengthens the individual's feelings toward the organization (Membership).

Technologies that draw attention to the organization and distinguish it from other organizations serve to strengthen the individual-organization relationship. We believe this is because identifying the organization as unique from other organizations instills a sense of pride in members of the organization. In this case, websites that provide information on the organization, e-mail accounts sponsored by the organization, and network shared drives with organization-related documents strengthen the individual-organization relationship and make it more positive than the relationship would be without such technologies. This observation is directly aligned with the identification work of Dutton and Dukerich [10] and Dutton et al. [11].

Observation 10. Technology that enables an individual to emerge as a leader of a group leads to a more positive Individual-Group relationship (Differentiation).

The importance of differentiation has been previously noted in Observations 3 and 6. In the individual-group relationship there is an added dimension to differentiation where it is important as it relates to a leadership role of an individual in a group. Individuals feel more positive about groups to which they belong when they can distinguish themselves from others in the group by assuming the leadership role. Several individuals responded to questions regarding the individual-group relationship by stating they feel more positive

about the relationship because it "helps [them] be a leader" and allows them to "take charge."

4. Discussion

We presented a number of observations regarding the variables that determine how technology impacts the individual-organization and individual-group relationships in an organization. One of the overarching themes involves a tradeoff between variables that are either Unifying or Distinguishing (Observations 3–7). Technologies, or combinations of technologies, that can manage the tradeoff between Unifying and Distinguishing should succeed in creating and maintaining strong, positive relationships between the individual and the organization. Thus, organizations can seek a balance between the various technologies used for communication in order to ensure that a sense of unity is developed, but not to the point that individuals feel like unimportant cogs in the organizational machine. This is particularly interesting because the need for balance is not something that a regular survey study could have discovered. The grounded theory approach enabled us to examine the phenomenon in depth thus providing an additional research contribution.

The research complements and extends the work of Dutton et al. [11] who conclude that an individual's strong identification with an organization leads to a strong relationship with the organization. We extend this in several ways. First, identification is aligned with only one of eight categories derived in this work (Membership, Observation 9). Second, we include consideration of the individual-group relationship as well as the individual-organization relationship. Third, we consider the reverse of the Dutton et al. [11] situation for cases where our identified categories are weak or negative.

The observations of this study are derived from the collected data and presented in groupings of related observations. Interestingly, none of the observations mention the model factors "customization" or "relevancy." These two factors were present in the data and are thus included in the model. Obvious insights were not apparent from the data—requiring additional research in the future. Figure 2 presents the approximate percentage of responses that are consistent with each of our observations. Because data collection and coding continued until data saturation was achieved, not all data were coded. This figure (and figure 3 presented later) is based upon $n = 1{,}178$ data points, and should be used to indicate relativity instead of specific percentage values.

Figure 3 presents the percentage of responses that fall into each category for both the individual-organization and individual-group relationships to provide an indication of the importance of each variable relative to the others. As indicated by the figure, all eight variables in the model are supported by the data, and the trends are similar for both relationships. For example, responses for both the individual-organization and individual-group relationships indicate that Connection, Convenience, and Membership received significantly more attention from participants than the other variables, suggesting they may play a larger role in influencing the individual-organization and individual-group relationships than the other factors in our model. In the individual-organization

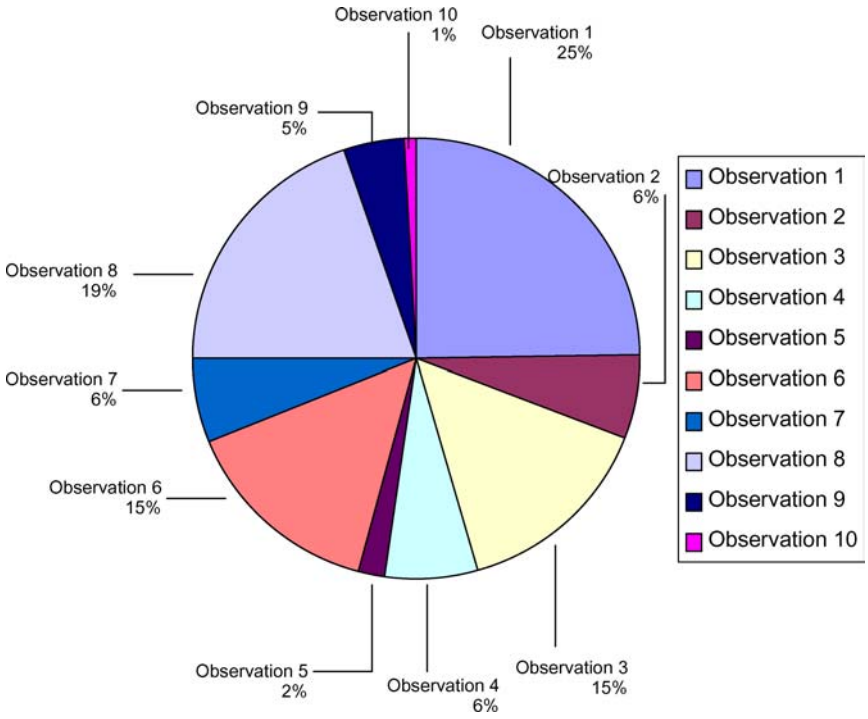

Figure 2. Data support for each observation.

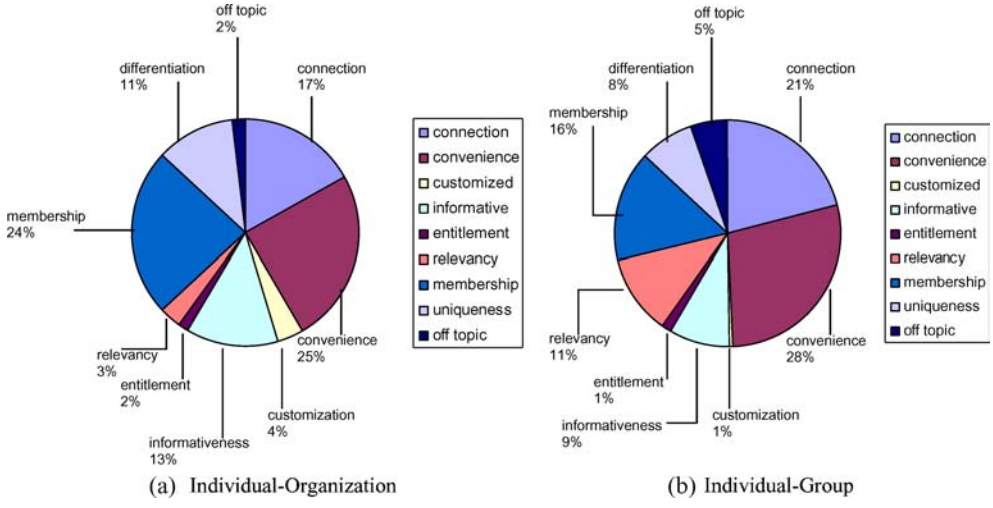

Figure 3. Percentage of response data per category.

relationship, Differentiation and Informativeness received more attention than in the individual-group relationship. This makes sense because individuals struggle more to stand out and remain current in large groups of people (i.e., the whole organization) than in smaller groups of people (i.e., a group within the organization). As a result, the majority of the observations from this work focus on Connection, Convenience, and Membership. Relevancy received more attention from respondents for the individual-group relationship than for the individual-organization one. Again, this conclusion is consistent with the nature of smaller groups within an organization versus the larger organization where it is easier to develop ties in smaller versus larger groups of people. Because of this, technologies have a lesser impact on the individual-group relationship than the individual-organization relationship in general. The fact that only 3.5% of all responses are off-topic, and all other responses fall into one of the categories in our model, suggests that we adequately capture the collected data in the categories we present in our model.

The presented observations look at the broad impacts of technology on the strength and nature of individual-organization and individual-group relationships that exist within organizations. The results of our study can also be analyzed to determine if the factors in our model are more or less relevant for the individual-organization and individual-group relationships depending on the specific technology used for communication. The data indicate that in general, all of the categories in our model are relevant for each technology, as well as face-to-face communication to a lesser degree, but there are several notable exceptions to this conclusion.

First, the data indicate that Connection is the most influential category in both the individual-organization and individual-group relationships when communication occurs through people-oriented means—face-to-face and telephone. In contrast, Convenience is most influential for all of the technologies, other than telephone, considered in our study. We say "most influential" because these categories received the most responses in our survey. Also, it is interesting to note that e-mail and shared drives are the technologies that received the most responses when compared to the other technologies.

Second, for both the individual-organization and individual-group relationships, no responses that are classified under Customization were given for static websites. This suggests that organizations and groups should not rely on static websites to engender a sense of customization among members of the organization and group. This is fairly intuitive considering the typical purpose static websites serve. However, this could be important for organizations that utilize websites, particularly on intranets, to post company news and current events. In this case, for example, organizations might allocate resources to develop a website layout that draws attention to employee specific information. For the individual-group relationship, in addition to static websites, no responses that are classified under Customization were given for dynamic websites or shared network drives. This may be partially attributed to the fact that Customization plays a smaller role in the individual-group relationship than in the individual-organization relationship (see figure 3), so fewer responses overall are classified under Customization.

Third, for both the individual-organization and individual-group relationships, Connection is not noted by respondents as much as the other variables with respect to static or dynamic websites. This suggests that organizations should not rely on either static or dynamic websites to help create a sense of connection between individuals and the organization of which they are a part, or should actively promote this technology for the dissemination of information. Active promotion of static and dynamic websites can combat under-utilization of these technologies, which may be one reason why these technologies do not currently engender a sense of connection to the organization.

Fourth, few responses that are classified under Entitlement were given for e-mail, static websites, dynamic websites, and the telephone for the individual-group relationship. Overall, these Entitlement responses are fewer than for the individual-organization relationship, and this may explain why so few responses were provided under each of these technologies. Also, it is possible that respondents feel more "lucky" than "entitled" to access technologies that did not receive many responses.

Fifth, only two responses that are classified under Membership were given for dynamic websites regarding the individual-group relationship. This suggests that dynamic websites are not useful for creating a sense of membership within a group. In fact, according to some responses, dynamic websites create a sense of competition among individuals, which counters a sense of membership, when members of a group are competing for limited resources via a dynamic website (e.g., housing lottery, course registration).

Sixth, Relevancy should be addressed when evaluating the role of a technology at impacting the individual-organization and individual-group relationships. However, we must use intuition here to posit that the majority of individuals feel the technologies, as well as face-to-face communication, are relevant to the individual-organization and individual-group relationships by what respondents did not say. Specifically, the mere fact they answered our open-ended survey without stating they could not complete the survey because the technologies were simply "irrelevant" is a strong indication respondents feel the communication media are all relevant for the individual-organization and individual-group relationships. Relevancy, or the lack thereof, is important to the relationship in the sense that when individuals feel the means for communication is not relevant, it will not have an effect on the relationship.

We also compared the data for face-to-face communication with the technology data collected in order to identify aspects of the model that are technology-specific versus those that hold for communication in general. When the face-to-face data are considered along with technology-mediated communication, we note that the face-to-face data are primarily categorized under Connection or Differentiation, with very few or no data for the other parts of the model. Thus, we believe that the model is specific to technology impacts on individual-organization and individual-group relationships.

In general, face-to-face and telephone communications are considered to be inconvenient for the individual-organization relationship when compared to other types of communication evaluated in our study. This is somewhat intuitive because arranging meetings and contacting organizational representatives is much easier via such technologies as e-mail and shared drives than via telephone or face-to-face communications.

However, this conclusion also indicates that individuals may be increasingly comfortable with alternative forms of communication. Again, this exception does not hold for the individual-group relationship, perhaps because it is easier to coordinate a group of people, rather than an entire organization, via face-to-face or telephone communication. The individual-organization relationship will benefit from technologies (e.g., e-mail, web sites) that facilitate convenient communication more then telephone or face-to-face communication.

Also, a disproportionate share of the responses for face-to-face communication in the individual-organization relationship are in the Differentiation category. This is intuitive, and it is useful for organizations because they can encourage face-to-face communication in situations where the organization wants individuals to feel special and important to the organization, especially if the current organizational environment is not conducive to creating such an atmosphere. All of the responses provided for static web pages and shared drives that are classified under Differentiation were negative comments, suggesting that neither technology effectively creates a sense of specialness in individuals. This exception does not hold for the individual-group relationship, perhaps because, by the nature of a group, it is easier for individuals to feel "special" and unique in a group than in the larger organization.

Overall, each technology has traits that contribute to the nature and strength of the individual-organization and individual-group relationships, and from both the good and bad perspectives. Thus, no one technology is necessarily better than another at strengthening or making relationships more positive. However, ideas for future innovations or improvements to technologies, as well as guidance for future technology investments, can be gleaned from this research as indicated above.

5. Conclusions and future directions

The model presented in this paper serves as a first step toward understanding the key factors that impact the relationships between the various levels within an organization. Businesses should consider our observations when evaluating an IT investment intended to enhance either the relationship between individuals in the organization and groups to which they belong or the relationship between individuals and the organization itself. We have shown that technologies should be convenient and easy to use, develop a sense of fairness and equity among peers, and engender both a sense of membership and connection to the organization. Some negative effects to the individual-organization relationship appear as a result of the impersonal nature of technology, but overall the positives outweigh the negatives, and communication that is more personal (e.g., face-to-face, telephone), possesses its own set of shortcomings, particularly inconvenience, inequity, and exclusion. The negative effect of impersonal technologies is less pronounced in the individual-group relationship.

There are two potential limitations of the study presented herein—group definition and personality considerations. The survey asks for any groups or teams to which

individuals belong without providing a clear definition of what constitutes a group or team. This is acceptable because we are interested in groups in their most general form which includes any situation involving more people than just the individual but fewer than the entire organization. Also, regardless of whether the group is a study group, sports team, sorority, etc., the same basic features are shared by each—voluntary membership, homogeneous membership, organized for a particular purpose, subset of the organization. In order to avoid concerns regarding this issue in future work, a revised survey has been composed that clearly defines what constitutes a group.

Also, individual personalities may affect the feelings that one has about the various technologies we examined in this study. Personality issues are outside the scope of this paper and left for future work. Furthermore, future work will examine the role of each variable identified in our model in greater detail. We will seek to answer questions such as *How do the variables impact the individual-organization and individual-group relationships?* and*To what extent does each variable impact the relationship and under what conditions?* We have begun to touch on these questions here, but more research and validation of our claims are necessary in these areas.

Based on our observation that each variable tends to enhance the individual-organization and individual-group relationships in an organization, and the absence of a variable hinders the relationships, we believe the factors can be thought of as binary variables. In this sense, a technology is either convenient or not convenient, instills a sense of membership or does not instill a sense of membership, etc. But again, additional research is necessary to determine if the factors can, in fact, be described in this way.

Lastly, the fact that a grounded approach was taken suggests our model is valid and should be applicable in the real world. However, the fact that a student population was used in this study is a limitation in terms of external validity and the applicability of our observations. Data ought to be collected from additional sources to further validate the model, and a corporate survey is underway.

Appendix—Survey questions

Please answer the questions in this survey as completely as possible, keeping in mind we are only interested in your experiences within the Georgetown University community unless specified otherwise. Professor Dillon will provide an explanation of this survey after it has been completed.

1. Why do you feel a part of the Georgetown University community when you use . . .
   (a) E-mail,
   (b) Blackboard,
   (c) Network shared drives,
   (d) Static websites (e.g., where you can check for information),
   (e) Dynamic websites (e.g., online registration, banking, housing lottery, etc.),

(f) Telephone,
(g) Face-to-face contacts,
(h) Other communication method (if applicable, please describe type and reason)

2. Why *don't* you feel a part of the Georgetown University community when you use . . .
   (a) E-mail,
   (b) Blackboard,
   (c) Network shared drives,
   (d) Static websites (e.g., where you can check for information),
   (e) Dynamic websites (e.g., online registration, banking, housing lottery, etc.),
   (f) Telephone,
   (g) Face-to-face contacts,
   (h) Other communication method (if applicable, please describe type and reason)
3. Think about any groups or teams that you have been a part of while at Georgetown. Why do you feel a part of a group or team when you use . . .
   (a) E-mail,
   (b) Blackboard,
   (c) Network shared drives,
   (d) Static websites (e.g., where you can check for information),
   (e) Dynamic websites (e.g., online registration, banking, housing lottery, etc.),
   (f) Telephone,
   (g) Face-to-face contacts,
   (h) Other communication method (if applicable, please describe type and reason)
4. Think about any groups or teams that you have been a part of while at Georgetown. Why *DON'T* you feel a part of a group or team when you use . . .
   (a) E-mail,
   (b) Blackboard,
   (c) Network shared drives,
   (d) Static websites (e.g., where you can check for information),
   (e) Dynamic websites (e.g., online registration, banking, housing lottery, etc.),
   (f) Telephone,
   (g) Face-to-face contacts,
   (h) Other communication method (if applicable, please describe type and reason)
5. Think about any groups or teams that you have been a part of while at Georgetown. How do you feel those groups fit in with the Georgetown University community as a whole?

6. Thinking about your answer to question 5, how do each of the following impact how you feel about the position of your group within the university?

   (a) E-mail,

   (b) Blackboard,

   (c) Network shared drives,

   (d) Static websites (e.g., where you can check for information),

   (e) Dynamic websites (e.g., online registration, banking, housing lottery, etc.),

   (f) Telephone,

   (g) Face-to-face contacts,

   (h) Other communication method (if applicable, please describe type and reason)

7. Think about any groups or teams that you have been a part of while at Georgetown. How do you feel that you, as an individual, fit in with the group?
8. Thinking about your answer to question 7, how do each of the following impact how you feel about fitting in with the group?

   (a) E-mail,

   (b) Blackboard,

   (c) Network shared drives,

   (d) Static websites (e.g., where you can check for information),

   (e) Dynamic websites (e.g., online registration, banking, housing lottery, etc.),

   (f) Telephone,

   (g) Face-to-face contacts,

   (h) Other communication method (if applicable, please describe type and reason)

9. Thinking about your answer to question 7, how do each of the following impact how you feel about *NOT* fitting in with the group?

   (a) E-mail,

   (b) Blackboard,

   (c) Network shared drives,

   (d) Static websites (e.g., where you can check for information),

   (e) Dynamic websites (e.g., online registration, banking, housing lottery, etc.),

   (f) Telephone,

   (g) Face-to-face contacts,

   (h) Other communication method (if applicable, please describe type and reason)

10. On a scale of 1 to 7, please *circle the number* that rates how competent you feel you are with each of the following:

	Extremely incompetent			Average			Extremely competent
E-mail	1	2	3	4	5	6	7
Blackboard	1	2	3	4	5	6	7
Network shared drive	1	2	3	4	5	6	7
Static websites	1	2	3	4	5	6	7
Dynamic websites	1	2	3	4	5	6	7
Telephone	1	2	3	4	5	6	7
Face-to-face contacts	1	2	3	4	5	6	7

11. Please put a *checkmark in the column that corresponds to the time period* that best describes how long you have used each of the following (including all time whether while at Georgetown or elsewhere):

Medium	Less than 1 month	1–6 months	6–12 months	1–3 years	3–5 years	More than 5 years
E-mail						
Blackboard						
Network shared drive						
Static websites						
Dynamic websites						
Telephone						
Face-to-face contacts						

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