

**A Theoretical Framework for Describing Effects of Virtual Interactivity  
between Government and Citizens: The Chicago Police Department's Citizen  
ICAM Application**

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## **A Theoretical Framework for Describing Virtual Interactivity between Government and Citizens: the Chicago Police Department's Citizen ICAM Application**

### **Abstract**

*This paper considers the current efforts to describe the effect of Internet-based technology on interactivity between citizens and public organizations to be incomplete and poorly linked. This paper develops a model of interactivity that reflects the self-organization potential of virtual communication and the social context within which citizens and bureaucrats operate. The model helps us to identify ways in which different levels of feedback communication, e.g., email, may affect change in organizations, communities, and the relationship between organizations and communities. A case analysis of the Chicago Police Department's (CPD) Citizen ICAM is reviewed to determine the effects of feedback and the technology on the organization. We find that virtual interactivity is a complex process – more complex than typically described – that has significant effects on the structure and work processes of the CPD. We conclude by proposing a staged model of citizen-government interactivity and by identifying future research directions.*

# **A Theoretical Framework for Describing Virtual Interactivity between Government and Citizens : the Chicago Police Department's Citizen ICAM Application**

## **1. Introduction**

The radical communication technologies of the Internet and the World Wide Web are expected to alter the relationship between citizens and government, but how? Recent literature on the social effects of the Web considers that by increasingly personalizing experiences, the technology threatens to de-emphasize and ultimately hinder public and community life (Shapiro, 1999). Bovens and Zouridis raise the concern that increasing reliance on information and communication technologies (ICT) will work to dehumanize the bureaucracy (2002). Other researchers believe that the technologies not only hold the promise for increased efficiency and effectiveness of government, they also may enhance the ability of citizens to interact with bureaucrats and politicians in meaningful and civically productive ways (Shi and Scavo, 2000). Some of the reasons why there is confusion about the ultimate effects of eGovernment on citizen government interaction are the newness of the technology, the fact that only around half of the citizens are connected (Nie and Erbring, 2000), and the small portion of governments that have developed eGovernment strategies (Norris, Fletcher, and Holden, 2001). Nevertheless, surveys clearly show that governments recognize that eGovernment has changed the way it operates: roles of staff, demands on staff and business process are being changed (Norris, Fletcher, and Holden, 2001). These studies beg the question that this paper will attempt to clarify: How does the Internet change the nature of the interactive relationship between citizen and bureaucrat?

In the field of Public Administration, the Cyberspace Policy Research Group (CyPRG) at the University of Arizona has been working to address the issue of interactivity the longest. Based on the reasonable premise that the openness of websites provides a window into the willingness of organizations to divulge information and interact with citizenry, CyPRG developed a means of measuring two constructs called transparency and interactivity. Transparency concerns the extent to which an organization provides information about activities and decision processes. “[In terms of a web site, transparency] constitutes a layman’s basic map of the organization as depicted in the information on the site [and] reveals the depth of access it allows, the depths of knowledge about processes it is willing to reveal, and the level of attention to citizen response it provides (La Porte, et al., 1999, p. 6).” The more transparent an organization’s website, the more it is willing to allow citizens to monitor its performance (Reichard, 1998). Interactivity concerns the quality of communication between the public organization and the citizen. “[It] is a measure of the level of convenience or degree of immediate feedback [provided] (La Porte et al., 1999, p. 6).” Together, interactivity and transparency are two measures that indicate the willingness or ability of an agency to be accountable and responsive to citizens (Welch and Wong, 2001).

However, we consider the CyPRG interactivity construct and measures to be problematic for a number of reasons. First, the measures of interactivity are limited (see Appendix 1 for the detailed measures). Interactivity, by layman’s definition alone, implies a two-way exchange of information / communication. However, CyPRG measures define interactivity primarily as “clickability:” ability to click on an individual’s name to write an email response or query, or the ability to retrieve information with the click of a mouse<sup>1</sup>. Second, the measures employed by

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<sup>1</sup> CyPRG recently added a measure that considers whether or not the end user receives an automatic generated response, however CyPRG does not measure the actual interaction in terms speed or response, quality or usefulness of response, level of response, or other factors that may better describe interaction.

CyPRG create a sense of passivity for the end user and poorly recognize the end user's role in the process of eGovernment. Emphasis is placed on government's willingness and ability to place information on the website. However a study of interactivity should also incorporate the role of the end user in effecting this transaction. Third, the CyPRG measurement system is relatively blunt, coding "1" or "0" depending on whether the element exists or not. Interaction is a complex process that implies different rationales for end user communication, different types of organizational response, different levels of individuals in the organization responding to end users, different qualities of communication, and different effects of the communication on the organization, end user, and the public's business.

While the work completed by CyPRG has made significant contributions to the field of public administration, a more complete definition of interactivity should include efforts in other fields to help interpret, explain and predict Web-initiated change in citizen-government interaction. However, scholarly work on interactivity and the Internet is diverse and spotty. The next section of this paper will take an interdisciplinary approach to the review of research on interactivity. Based on that analysis, we will then present a basic model of interactivity for the public sector and identify the specific areas in which Internet-based interaction between citizens and bureaucrats can change organizations, communities, and the relationship between them. Finally, we will examine one element of interaction; Internet-based citizen feedback and agency response for the Chicago Police Department's Citizen ICAM system, to elicit a richer understanding of process and effects of web-based technology on citizen-government interaction. We end by proposing a staged model of interactivity and discussing future research possibilities.

## **2. Interactivity Literature**

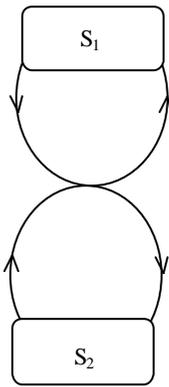
Despite the growing importance of the Internet in our everyday lives and the development of government initiatives on the web, research on interactivity in a technological context is limited and sprinkled through many different fields. The following literature review in the fields of psychology, communication, distance learning, political science, and public administration helps provide the background for a more complete model of citizen-government interaction.

In the field of psychology, researchers have explored the impact that the Internet has on social ties, cognitive development, and community. Much of the work has produced evidence that underscores the implications of the interactive nature of the Internet and its effect on the individual user's development. For example, Riva and Galimberti (1997) identify two structural features of interaction: co-presence of utterances and cognition. Co-presence of utterances occurs when the users communicate with one another. Cognition occurs through and between the user's coordination of their action and their availability to one another (Riva and Galimberti, 1997 & 1998). Accordingly, visualization of communication based on the traditional parcel-post interaction model, in which one individual ( $S_1$ ) passes information to another individual ( $S_2$ ) (Figure 1), is being replaced by the new, more complex communicative interaction model (CIM) (Figure 2). According to the CIM any piece of communication is intended for both sender and receiver in a "double listening" process. Communication is a cooperative action in which the sender must receive a response from the receiver in order to fully grasp what has been transmitted and understood.

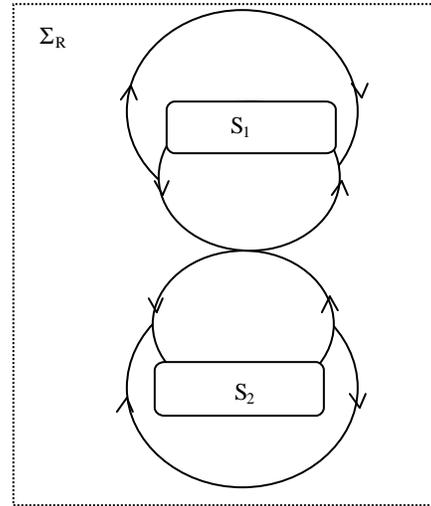
As a result, the sender is continuously comparing what he/she has sent with the return communication. In this cognitive model, the individuals place a boundary around the conversation to control the temporal and connotative limitations of the interaction. The area

within this boundary is called the *shared interlocutory space* and is denoted by  $\Sigma_R$ . The CIM indicates that communication is a coordinated event in which both individuals recognize that they are contributing to the creation of a mutually acceptable reality through conversation.

This is especially relevant to the virtual world of the Internet. Riva identifies two characteristics of the virtual reality systems: a *disappearance of mediation* where the physical world has lost its contextual meaning and a *sense of community* that is developed through interaction (Riva, 1999). It is through the interactions in the virtual environment that the end user establishes social ties through shared experiences and common interests as well as removing his/her “physical” barriers.



**Figure 1. Parcel Post Model**



**Figure 2. Communicative Interactionism**

In follow-up, Mantovani states “interaction is made up of patterns of activity... how activities come together and shape each other on different occasions (1996, p. 239).” He asserts that it is through these interactions that situations are evaluated and personal goals are shaped. What is most important here is that interaction is continually changing, not only in the mind of the actors “but the very structure of their connection (Mantovani, 1996, p. 240).” And, Granic and Lamey posit that the Internet is a self-organizing entity and this organization is a direct result of the interactivity of users. “[The Internet] has the potential to catalyze major shifts in the cognitive styles and beliefs of its interactants (2000, p. 94).” Based partially on research concerning self-organizing systems, Granic and Lamey discuss the tendency of such systems to create more intricate and complex interactions, and for simultaneous evolution of the users, the system, and its networks.

Important work by Rice in the related field of Computer Mediated Communication (CMC) acknowledges the duality of interactivity and the importance of the roles of both the initiator (read government) and the end user (read citizens). Further, it acknowledges interactivity as a communication process that goes beyond the click of a mouse and involves the willing participation of at least two separate parties (1987). Neither the psychology nor the CMC literatures incorporate notions of the citizenry, community, organizations, or bureaucracy in the communication models. However, to fully understand interactivity, incorporation of the organizational and community contexts is essential.

Research in political science has sought to identify the effect of different web-based technologies on political participation (Bimber, 1999). For example, one study examined the content of 270 municipal websites in California to determine the extent to which the technologies offered support to governance reform efforts (Musso et. al, 2000). Researchers identified two categories for governance – the entrepreneurial role as a service delivery system and the civic role as the “first level of democratic participation (p. 3)” – according to which municipalities can employ web technologies to enhance participation. Findings indicate that application of web-based interactivity is highly complex and can occur in different ways and at different degrees depending upon the categories of governance and the reform objective of the municipality. Similarly, Carpini finds that the unique characteristics of the Internet<sup>2</sup> have a direct bearing on interactivity (2000). For example, there is a distinction between interactions that occur on a one-to-one basis versus communication occurring on a one-to-many basis. Additionally, dependent upon the focus of the activity, interactivity will vary because the technologies addressing each population vary. In summary, the political science research available supports the claim that interactivity is much more than a function of “clickability,” and that there are different levels and channels of interactivity that occur depending upon the target (citizen or other public entity). However, the approach provides more commentary than specific guidance about how the Internet affects citizen-government interaction.

In the public administration literature, the Cyberspace Policy Research Group (CyPRG) researchers have had a significant impact. Most importantly for this paper, CyPRG makes the explicit linkage in their research between interactivity of the website and the behavior of management. They indicate that managers vary in their desire to maintain control over information and their desires to utilize new innovations to solve existing problems. High levels of managerial control results from a desire to limit the release of information and minimize required levels of interaction with citizens and politicians. They hypothesize that higher levels of interactivity of web sites may indicate lower levels of managerial control in public organizations (La Porte, et. al. 1999; Demchak et. al, 2000; 2001). The linkage between management and the website is an important element of a broader linkage that needs to be made between interaction and the organization. Websites and they way they are managed are elements of the social, political, economic and cultural context of the organization. Any model of web-mediated citizen-government interaction must therefore be linked to the public organization.

Outside of the research conducted by CyPRG, the literature often attempts to link the Internet-based interactivity with effective/efficient government or with the stages of eGovernment. For example, Shi and Scavo examine participation and democracy on the Internet and how to strengthen their impact at the local level (2000). They argue that government can become more effective through improvements in information, communication and participation. In agreement with CyPRG, Shi and Scavo state, “all the information that can be made public and of importance to the public should be put online (p. 255).” Further, to address efficiency in the computer environment, email should be employed to cut back on bureaucracy and open communication lines between citizens and government officials and bulletin boards and feedback systems can be effective in identifying public opinion (Shi and Scavo, 2000). However, other research warns that electronic advances may be precariously increasing the level of complexity

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<sup>2</sup> “. . .the new media environment (a) increases the speed with which information can be gathered and transmitted, (b) increases the volume of information that is easily accessible, (c) creates greater flexibility in terms of when information is accessed, (d) provides greater opportunity and mixes of interactivity (one to one, one to many, many to one, and many to many), (e) shifts the nature of community from geographic to interest based, (f) blurs distinctions between types of media (print, visual and audio), (g) challenges traditional definitions of information gatekeepers and authoritative voices and (h) challenges traditional definitions of producers and consumers of information (Carpini, 2000).”

of communications and transactions within organizations and between organizations and citizens. Klischewski and Wetzel find that the development of eServices increases organization complexity due to increases in transaction complexity – “transaction processes become more personalized, involve more organizational units, require more cooperation and expertise, make staying in touch with the client (citizen) more difficult, and may cause more damage in case of processing breakdown (p. 2, 2002).” As increasingly sophisticated internet applications seek to simplify this process, the organization risks becoming an “anonymous inflexible machine interface.” They recommend a development of service-flow management program in which organizational flexibility and citizen interaction become conscious priorities.

Research in the field to distance learning also highlights the complexities of electronic interaction. Gunawardena et al. define interaction as “the process through which negotiation of meaning and co-creation of knowledge occurs in a constructivist learning environment (Chou, 2002, p. 2).” Chou finds that in the area of distance education, increased learner-learner “interaction is a critical indicator of learner satisfaction, higher levels of academic achievement, higher levels of motivation, and a positive attitude towards distance education (2002, p. 1).” Fulford and Zhang also find evidence showing that overall levels of perceived interaction between students and teacher contributes to perceived value and quality of instruction (1993). It is not such a jump to consider the citizen-citizen and citizen-agency interaction in a similar light – interaction as an important indicator of citizen satisfaction with government.

As government agencies continue to develop eGovernment initiatives in order to achieve a desired level of efficiency and/or effectiveness, the options for interactivity change. Gartner Group Inc. has developed a model on the four phases of eGovernment: Presence, Interaction, Transaction, and Transformation (Sood, 2001; Baum and Di Maio, 2001). Some level of interactivity occurs under each of these phases. The defining factor here is the complexity of the interactivity. In the first level of eGovernment, Presence, a government could meet CyPRG’s expectations of interactivity by linking the user to official documents. However, in the Transformation stage, the sophistication of interaction changes to where the user can vote online. Others describe five stages of eGovernment – information dissemination, two-way communication, transaction, integration, and political participation– in which the linkage between citizen and government is based on task (services, politics, or government business) (Hiller and Bélanger, 2001). Here too, the character of interaction seems to change as the government moves through the stages.

In summary, the psychology literature provides a useful behavioral mechanism that is clearly lacking in the public administration and political science literature. However, it generally ignores or rejects the existing social context of the physical world. Inversely, the public administration and political science literatures make some effort to incorporate the complexity of organizational and institutional reality into studies of technology facilitated interaction, but they provide little in the way of a behavioral model. The following section will attempt to formally combine the two research trajectories.

### **3. Theoretical Model**

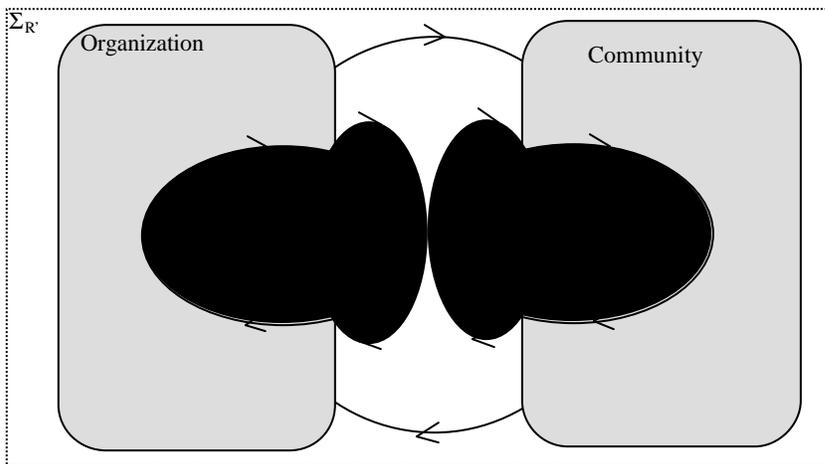
We combine the communicative interactionism model (CIM) with the specific institutional and organizational considerations that are fundamental to describing the relationship between government and community in the field of public administration. Despite the newness of virtual communication and the disappearance of mediation, communication between individuals is a

function of the social context within which they operate. For the citizen, the social context is the community; for the bureaucrat it is the public organization. Citizen values, needs and objectives are linked or embedded in the values, needs and objectives of the community within which they identify. Bureaucrat behaviors are also undeniably linked to the culture and structure of the organization within which they work, and the managers from whom they receive direction. Moreover, the relationship between citizen and bureaucrat continues to be based on public service. As a result, any model of interaction between citizen and government must explicitly include the broader social contexts from which they originate (Figure 3).

One important element of Internet communication concerns the potential reorientation of the physical entities of organization and community with virtual replacements. This model does not reject the physical in favor of the virtual world, but rather acknowledges the interconnections between the two.

In addition to the incorporation of the social context, Figure 3 implies two other changes over the Communicative Interactionism Model (CIM) in Figure 2. First, the shared interlocutory space in the CIM ( $\Sigma_R$ ) changes to encompass a much broader array of elements in the new model. Communicative interaction through individuals incorporates considerations of the social context within with each participant is embedded. For example, a bureaucrat's response to an email reflects the structure and process of the organization, values of management, as well as the individual respondent's position and role. Queries by citizens will reflect the socio-economic realities, local concerns, history, and institutions (norms and expectations) of the community. As a result the shared interlocutory space expands from  $\Sigma_R$  to  $\Sigma_{R'}$ .

**Figure 3. The Social Context of Communicative Interaction**



Finally, because the new model incorporates the social context of the individual communicators, the relationship between the two entities must also be expressed. Not only are two individuals interacting, but the organization and the community are also communicating via the individuals. Communication is not simply embedded within the separate social contexts of the individuals; it is also embedded within the historical context of the relationship between the two distinct social entities. For example, when a citizen communicates with a police officer online, the shared interlocutory space includes not only the contexts of organization and

community, but also the relationship between citizens and police more generally. For this reason, the new model (Figure 3) creates interaction lines between organization and community.

Recognizing the communicative and psychological importance of the Internet, Riva and Galimberti state, "Interaction is the key feature of Cyberspace, from which a new sense of self and community can be built (1997, p. 142)." However, the extent to which the innovation is endorsed and the way in which it is implemented will generally affect all three elements of the model: community, organization and the relationship between them. Interaction is at the heart of how Internet-based communication can change the roles of citizens and bureaucrats and relationships between communities and government. However, it is not simply a function of the technology itself but rather a function of the social context of the contact that determines the ultimate effects. To begin to explore the model in more detail, we first describe the types of communication that can take place and the potential elements of organizational, community and relationship change.

### **3.1. Internet communication and organizational, community and relationship change**

There are two different types of CMC that have been identified, synchronous and asynchronous (Riva and Galimberti, 1997, Wellman, et. al., 1996). Synchronous CMC occurs when communication between users occurs simultaneously. Hence, asynchronous CMC occurs when communication is not simultaneous. Examples of synchronous communication are chat rooms and multiple user domains (MUD). Examples of asynchronous communication are email and message boards. Synchronous communication occurs when there is real time communication between two or more users. Asynchronous communication does not require this "immediate" or "real-time" presence on the Internet, it allows for communication to occur based upon the availability and priorities of the users. This paper focuses primarily on asynchronous communication through email-based feedback systems.

In addition, we expect that the organization can choose among five options for response to an asynchronous query: non-response, generic response, direct informational response, referred informational response, and referred action. Non-response could be the result of poor assignment of responsibility, internal confusion, a conscious decision not to respond, or a number of other reasons. Generic response represents an acknowledgement to the sender that the message has been received, or a form letter response. Informational response refers to a direct provision of information by a bureaucrat whose job it is to respond to incoming email. It is a task in which the bureaucrat adds value to existing information to respond to a specific query. When the bureaucrat is unable to respond either due to limited knowledge or because the query requires more substantive action, the query is referred elsewhere in the organization. The citizen is typically notified of the referral. The individual, division, or department responsible then either responds to the citizen, either with information or action. Each of these types of responses represents an increasingly complex level of interaction between the citizen and government, and each holds potential implications for change in public organizations, communities and the relationship between them. We expect that the level of organizational response will effect different changes in the organization, the community and hence, the relationship between the two. To better explore this linkage, we have juxtaposed the type of response with the type of change (Table 1), and have filled in the resulting chart with potential elements of organization, community and relationship change.

**Table 1. Potential effects of Internet communication on organization, community, and relationships**

Type of Public Organization Response	Type of Change		
	Organizational Change	Community Change	Relationship Change
<i>No Response</i>	<ul style="list-style-type: none"> <li>• Role reassignment / description change ;</li> <li>• Structural change / intra-organizational networking;</li> <li>• Changed response times;</li> <li>• Prioritization of information exchange as critical to service delivery;</li> <li>• Increased organizational complexity;</li> <li>• Increased organizational stress;</li> <li>• Increased understanding of functions between units.</li> </ul>	<ul style="list-style-type: none"> <li>• Greater shared knowledge of community resources, interests, and needs;</li> <li>• Community organization changes;</li> <li>• Level of citizen trust of government;</li> <li>• Perceptions of government accountability;</li> <li>• Recognition / acceptance of government as valuable information source;</li> <li>• Level of community willingness to interact / communicate / cooperate with government.</li> </ul>	<ul style="list-style-type: none"> <li>• Greater shared knowledge / understanding of other’s needs;</li> <li>• Citizen and bureaucrat become partners in the response to societal stressors;</li> <li>• Joint involvement in determination of public agency procedures, priorities, and objectives;</li> <li>• Reciprocal relationships;</li> <li>• Stability in relationship;</li> </ul>
<i>Generic Response</i>			
<i>Info.</i>			
<i>Referral/ Info.</i>			
<i>Referral/ Action</i>			

For the organization, a history of non-response or generic response will probably obviate the ability of Internet communication to have any effect on organizational change. However, once an organization begins to provide an informational response, it has decided to dedicate a greater level of organizational resources to citizen interaction. As the point of contact in the organization, the bureaucrat responsible for feedback would need to be familiar with the different functions of the organization and would need a significant amount of information at her disposal to respond. Depending upon the priority that management places on this response function, a significant level of cross unit cooperation would be needed to place the responsible bureaucrat at the nexus of an information network from which she can manage responses. The organization would also need to develop an ability to prioritize information exchange critical to service delivery, requiring yet another level of inter-unit coordination or structural change. A further constraint to asynchronous communication is the response time involved. Long delays in response time represent a lack of responsiveness and accountability similar to non-response and generic response. Therefore, organizations determined to implement the informational response will need to simultaneously consider response times and efficient channeling of information. As the organization commits more resources and effort to the virtual feedback channel of communication, demands for information become more complex and may involve significant

follow-through by specific business units. At this point, the organization may begin to redefine the role of the bureaucrat in charge of response, to a more integrated role in which referral to other business units is routinized. From the organization perspective, the bureaucrats in the business units begin to take on the response role formerly held exclusively by the bureaucrat in charge of feedback for the organization. The ways in which organizations respond to such demands will vary depending upon the business, management perspective and level of interaction-based stress felt by the organization. In summary, type of response may simultaneously represent the level of commitment by the organization to asynchronous communication and the structure and work processes of the organization.

Virtual feedback will also affect the community's view of the government as the source of information, its trust in government, its understanding of organizational priorities and objectives, as well as the community's overall involvement in meeting these goals. Non-response or generic response probably implies no change or even a reduction in the level of community trust in government. However, detailed, speedy responses, relevant referrals, and resulting information or action may lead to greater trust, a stronger dependence on government for information, and a greater understanding of the organization and its priorities by citizens. Over time, citizens may realize greater involvement in public procedures, priorities, and objectives.

Different types of response may also affect the relationship between the organization and the community. Non-response or generic response may lead to negative perceptions about the openness of the organization, which may limit the ability of citizens and government to develop more substantive networks and partnerships. However, greater levels of organizational commitment and higher levels of citizen trust may lead to the evolution of a depth of communication not possible, due to tradition or technology, with other forms of communication. For example, when information exchange is considered fundamental to the relationship between the two entities, partnerships can form and interactions may be more efficient and stable due to the depth of transparency. When feedback involves some form of service related action on the part of the organization, there is the potential for substantive change in the relationship. The citizen/community can become a vested partner in the accomplishment of programmatic objectives. In turn, the organization is viewed as an open system where community involvement is valued.

In order to further identify the effects of Internet communication, we will explore the implementation of the email feedback system for the Chicago Police Department's Citizen ICAM Internet technology. We focus on the organizational change that has occurred and what these changes tell us about the priorities of CPD for asynchronous communication.

#### **4. Case: Chicago Police Department's Citizen ICAM**

Community policing emerged in the 1990's as a method by which law enforcement and citizens cooperatively identify and solve community problems. Community policing was a strategy that was developed as an answer to the rising crime rates across the country. In the late 1980's and early 1990's, residents were concerned about safety in their neighborhoods as drugs and gang activity rose in large cities across the country. Community policing provided police with a method for addressing crime in the area as well as involving concerned residents in the process.

In 1993, the Chicago Police Department (CPD) launched its community policing program, Chicago's Alternative Policing Strategy (CAPS). To implement the CAPS program, the

City divided Chicago's 25 districts into 279 "beats" (smaller administrative areas). For each shift in each beat throughout Chicago, police officers are specifically assigned to focus on community policing. Organized interaction occurs at local beat meetings, where residents identify community problems and work with police officers to identify solutions to these problems. Police officers work with community members to discover community priorities and utilize community intelligence to solve crimes. Advisory committees are also established to work with District Commanders on broader items such as police response and police-citizen interaction.

In 1994, the Department developed a crime-mapping program, Information Collection for Automated Mapping (ICAM), as beat-level crime information tool. This application gave officers and residents working through CAPS continuously updated information on crime activity and crime trends at any administrative and geographic unit of analysis. However, as CAPS gained momentum and more residents were engaged in the process, police officers working through CAPS were spending large amounts of time responding to resident requests for crime maps. Generating these reports took officers away from their main mission of implementing the beat plan for the neighborhood and it became clear that a publicly available application was needed.

One of these tools, Citizen ICAM (<http://12.17.79.6>), is an Internet technology that provides citizens and police with much of the same information on crime at the beat level. With this new application, citizens have the power to complete their own statistical queries in a tailored and on-demand fashion. The main goal of Citizen ICAM is to provide the citizen with a clearer picture of the crime occurring in their neighborhoods, thereby making beat meetings, officer activity, and other problem solving efforts more efficient.

#### **4.1. Citizen ICAM and the evolution of citizen government interaction**

Individuals use the Citizen ICAM technology for two main reasons: to determine crime data in a specific neighborhood and to query or provide information through feedback email. In the first case, Citizen ICAM allows individuals to query crime statistics by police beat, address, intersection and school district. Since its inception on September 28, 2000, Citizen ICAM has received over one million web page requests and responses. In terms of asynchronous feedback, between September 28, 2000 and June 30, 2002, CPD received 496 emails from users on the website.

The responsibility for Citizen ICAM feedback lies with the Technology Section of the CPD. Each email is given a control number for tracking purposes and all users receive a response (the average response time is four days). Further, the email and response is printed and stored in a logbook for future reference. Should any email require the follow-up/response of other units of CPD, a hard copy of the email is sent to the responsible unit as well as an email to the user (citizen) identifying the referral and control number. Referral units sometimes provide the Technology Section with written documentation of the follow up, which is placed in the logbook along with the original email.

For this analysis, the 496 emails were separated into four, approximately five-and-a-half month periods. Messages were initially coded and categorized into twelve substantive categories – questions: ICAM, technical problems, positive comments, negative comments, improvements: general, improvements: legend, improvements: length of data, questions: police procedure and response, current case / problems, report criminal activity, home purchase, and other jurisdiction

request. We then recombined the data into two general categories to better distinguish the emails based on their substance: application feedback and police business feedback. The application feedback category includes emails regarding the Citizen ICAM function, its utility, requested improvements to the system, and requests from other jurisdictions for the application source code. The police business feedback category includes emails identifying criminal activity in specified areas, problems with police response or questions about police procedure and response. (See appendix 2 for a list of categories and their explanations).

To date, the majority of email received from citizens (55 percent) occurred during the first period. During that time, most citizen emails were specific to the Citizen ICAM application, i.e., comments about the availability of the information online (Line A, Figure 4). These emails did not require detailed response from the police. However, by the second period many of the technology problems were solved and the ratio of police business (Line B, Figure 4) to application emails increased. By the third period, police response email feedback outpaced application-relevant emails. Moreover, the substantive nature of the communication changed as citizens began exploring the capacity of the feedback mechanism. For example, citizens began to report crime and request actions that went beyond the initial ability of the officer in charge. This led to greater efforts by the CPD to prioritize email feedback based on content and to more frequent generation of referrals from the officer in charge of response to other units in the organization. It also led to reassignment of roles. Although a technology development staff member was initially charged with feedback response, the number and content of the emails soon required that separate staff members be assigned to respond to application and police business email.

**Figure 4. Feedback: Application v. Police Response**

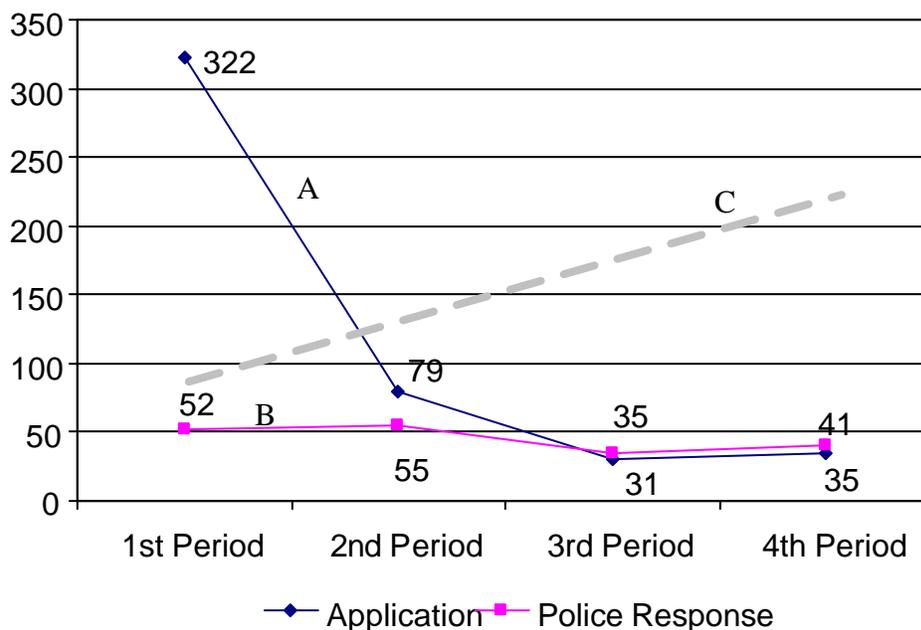


Figure 4 tends to hide an important qualitative element of the email communications: Over time the queries have increasingly required a more complex and formal responses by the police. For example, emails require several levels of written electronic and hard copy responses from the Technology Section to the citizen, from the bureau to the referral unit, and from the referral unit to the citizen. In addition, interactions are taking place over increasingly long periods of time. While the initial contact between the Technology Section and the citizen generally occurs within a few days, the interaction can continue for up to two months, as the issues are resolved. Due to the significant amount of time and resources required to respond to Citizen ICAM feedback, management was forced to evaluate the priorities of the citizen/government interaction to establish response levels. Therefore, even though the proportion of feedback versus web page hits appears to be relatively small, the demands that it has placed on the organization are significant and increasing (Line C, Figure 4). Furthermore, the rise in the amount of time and resources spent on responding to police business feedback and the related need for police expertise tend to further validate the decision to reassign roles.

As the substance of emails has changed over time, there are additional changes evident in the structure of the CPD. Because the police officer responding to the email is a member of the Technology Section located at Headquarters, and because responses and actions are generally the responsibility of officers in the area where activity is being reported, the proportion of referrals has risen over time. With the rise of referrals, there is an increased level of communication between departmental units (especially between non-operational officers in the Technology Section) and operational officers at the local level. This type of communication is new to the CPD and is thought to create greater understanding across functions and sub-units and contribute to a stronger sense of unity in meeting organizational objectives and citizen needs. Crime related emails have also driven interorganizational communication between the CPD and other law enforcement agencies. Figure 5 identifies the proportion of referrals made to the total number of emails received for each period. It is within these complex interactions that organizational priorities are identified. Two specific examples illustrate the referral process.

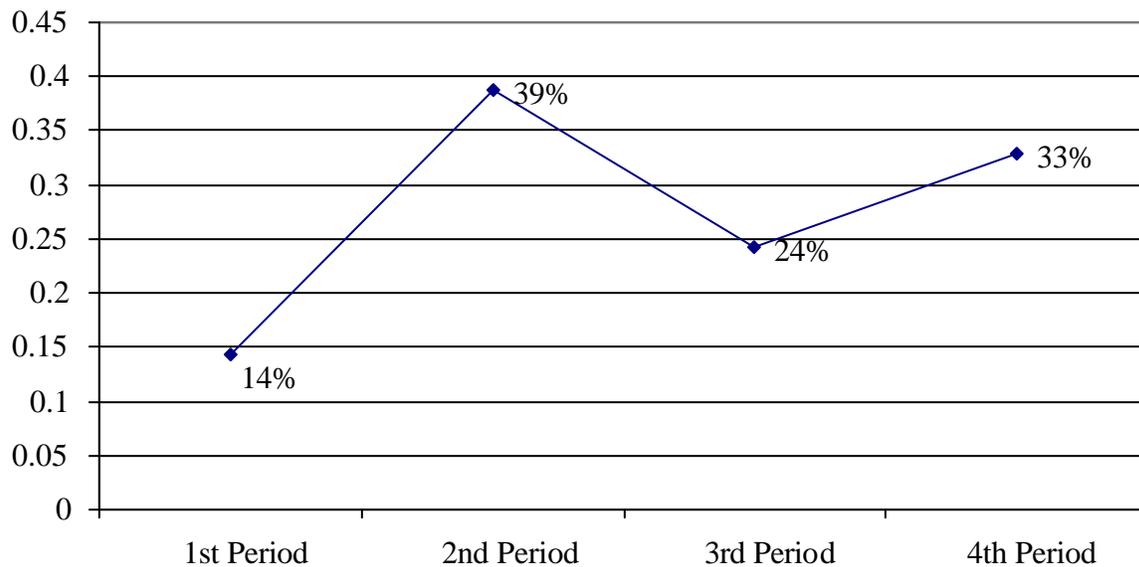
In the first case, one concerned citizen emailed the Technology Section about an offensive website that depicted young kittens crammed into small jars in order to achieve a desired “shape” for the animal – a practice known as bonding. The website included a transaction center where the reader could use a credit card order a bonding kit and a customer product reviews section. The technology officer verified the websites existence and forwarded the original email and supporting documentation to the CPD’s Bureau of Investigative Services (BIS). Illegal Internet activity does not fall under the purview of the Chicago Police Department. However, because the concern originated with a Chicago resident and Citizen ICAM communication was considered a priority, the Technology Section was directed to follow up. When the BIS subsequently notified the Federal Bureau of Investigation (FBI) they found that an ongoing FBI investigation had determined the website to be a prank constructed by two college students.

In the second case, one citizen used the feedback function to identify problems with a specific drug user loitering at an apartment building and causing disturbances. The two-page email detailed instances of encounters with the drug user and a physical description. Further, the citizen pledged her support of police activities, stated that she is active in community policing, and offered suggestions for improvement of patrol. Within two days, an original response was sent to the citizen where she was informed that a referral was made to her local district. Less than two weeks later, the Commander of the referral district sent the Technology Section correspondence

stating that an arrest had been made in connection with the original email from the citizen. The citizen was informed of the arrest via email.

These examples indicate that the CPD considers citizen contact through Citizen ICAM emails to be a valid and important source of crime information. Additionally, the email link appears to create another mechanism through which citizens can inform the police about community problems (narrowly and broadly defined) and through which the police are held accountable for action. Finally, the examples indicate the extent to which the Citizen ICAM feedback contributes to intra-agency and inter-agency cooperation for the attainment of objectives within the CPD.

**Figure 5. Police Referrals as a Percentage of Total Citizen Emails by Period**



Although this data and description is preliminary and limited, it appears that the email communication has affected the organization in three ways. First, it has caused a reassignment of roles. The organization now allocates responsibility for feedback to different individuals depending on the general business addressed. Second, responsibility for response to police feedback has shifted from the Technology Section to the entire range of police activities, making it increasingly distributed throughout the organization. Because the reporting, documenting, and communication requirements are quite extensive, the feedback mechanism allows citizens to learn more about police procedures and work processes. This may increase the transparency of the CPD from the citizens' perspective. Finally, the increased need for referrals has led to a greater degree of inter-unit communication and potentially increases understanding in the CPD about the function of different units and needs of citizens.

While the data presented here focuses on the structural and internal changes at the CPD, based on our hypothesis, it is also important to mention how the Citizen ICAM technology has changed the interactions between the community and the police. Initial interviews with police officers assigned to specific "beats" in Chicago indicate that Citizen ICAM has, at a minimum, increased the efficiency of monthly beat meetings. Prior to the existence of Citizen ICAM citizens and officers spent much of the time at beat meetings engaged in a discussion over the number and

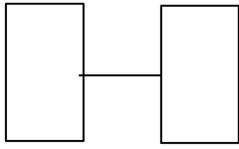
type of crime incidents in the neighborhoods. The roll out of Citizen ICAM provided citizens and officers access to the same basic crime data, thereby reducing disagreements on data and freeing up more time for solving problems. The extent to which the online availability of data serves as an implicit accountability tool affecting citizen trust of the police has not been tested. However, citizens clearly use Citizen ICAM to validate concerns about criminal activity and a number of police districts are using Citizen ICAM to develop meeting agendas and determine priorities for community and police response.

## **5. Conclusions**

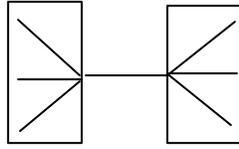
Although the empirical analysis is relatively limited, we have noticed that, as predicted by researchers proposing stages of eGovernment, the CPD has gone through different stages of interactivity development. If we take a heuristic of the model developed earlier in the paper, we can hypothesize a series of stages of interactive communication between citizen and government that grows out of virtual feedback. In stage one, an individual citizen interacts with an individual bureaucrat. The queries are simple and not significantly related to the business of the organization or the society within which the citizen exists. This stage may be especially focused on the application business of the Citizen ICAM as discussed above. Stage two would still follow a point-to-point (citizen to bureaucrat) interaction, however the request for information may reflect more substantive community based issues and the protocols established by the organization may require greater interaction among sub-units, hence networking and communication within each group increases. Stage three moves away from the point-to-point interaction because referrals for information and action throughout the organization require multiple types of follow-up with the individual and with the community. It is in this stage that email referrals among sub-units and district offices begin to require intra-agency communication, cooperation, and coordination as in the drug reporting, investigation and arrest case discussed above. In stage four, community and police have a history of interaction that has resulted in multiple partnerships and greater openness. Citizens better understand the police business and police better understand the goals of citizens. As a result, citizens and police are able to access each other at multiple points and interaction is frequent and complex both within the different social entities and between them; referrals, cooperative action, and mutual support are common.

The extent to which these models actually portray the evolution of virtual interaction between citizens and government is difficult to establish based on the limited analysis contained in this paper. However, these stages (at least stages one to three) seem plausible. In fact, our inquiry suggests that Internet communication has had a positive effect on the citizen-government interaction. More importantly, it appears that this virtual communication has led to better human contact between the police and citizens.

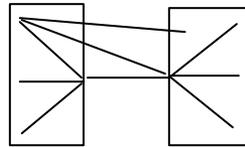
**Figure 6. Stages of Virtual Citizen Government Interaction**



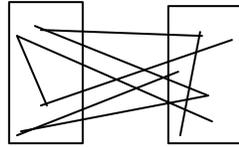
Stage 1. Virtual Point-to-Point



Stage 2. Virtual Networked Point  
to Virtual Networked Point



Stage 3. Virtual Networked  
Organization to Virtual Networked  
Point



Stage 4. Virtual Networked Organization  
to Virtual Networked Community  
Point

Regardless the existence of identifiable stages, this paper makes evident that virtual interactivity between citizen and government is more complex than either “clickability” or communicative interactionism. Virtual communication may lead to a *disappearance of mediation* where the physical world has lost its contextual meaning and a *sense of community* that is developed through interaction (Riva, 1999). However, citizens’ need for public service from traditional government organizations in the non-virtual world will not disappear. Therefore, any model of virtual communication in the public sector must still incorporate the social context of the physical world. Nevertheless, virtual communication reduces the *role of mediation* and makes it possible for citizens and government to redefine the *sense of community*. For example, display of crime statistics and other information reorients the role of citizen-bureaucrat interaction from one focused on information requests and distribution to more substantive issue-based communication where citizen and bureaucrat are more equally capable of contributing to problem solving. In addition, reorientation away from traditional information asymmetries has the potential to make governments and communities more transparent and thereby build mutual trust. Moreover, such factors as prioritization of feedback, role reassignment, speed of response, and credible referral action may act to redefine the *sense of community*; citizens and bureaucrats may gradually reorient their perceptions about each other, and the structure and substance of their interaction.

Despite the potential for virtual interaction to elicit organizational, community and relationship change, the form and extent of the change will be determined by a set of organization and community based intervening variables that include organizational structure, culture, size, resources, issue, management values, community access to use of technology, and citizen attitudes and values. Therefore, future research should not only seek to better identify the types of change that occur as a result of virtual communication in organizations, communities and their relationships, it should also begin to develop more explicit causal models. This may be especially true in the field of public administration where there is a significant gap in our understanding about how management affects the application of new electronic technologies to affect citizen-government interaction.

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**Appendix 1. CyPRG Coding Criteria for Interactivity / Accessibility (Source: [www.cyprg.arizona.edu](http://www.cyprg.arizona.edu))**

<b>Security and Privacy</b>	<b>Explanation</b>
I1a: Does NOT use information gathering techniques such as cookies to gather information about site visitors	Tests whether site uses techniques such as cookies or web bugs to gather information about user access or behavior on the site, thereby providing a degree of privacy to site visitor.
I1b: Does NOT require personal information (beyond return email address) to communicate with agency	Tests whether site requires that users provide any other information than email return address as a condition of communicating with the agency, thus providing a degree of anonymity to site visitor.
I1c: Site entails use of security access method, such as a password, or secure server (https://...)	Tests whether site provides access to site with password protection or via secure server.
I1d: Security access method, such as password or secure server use, is associated with transaction with agency or access to personal information	Tests whether site access involving transmission of sensitive or personal information is accompanied by use of security feature such as password or secure server.
<b>Contacts/Reachability</b>	
I2a: Provides email link to webmaster	Tests if email link to webmaster is (a mailto link).
I2b: Provides email link to senior agency official	Tests if the email link to any senior officials is clickable.
I2c: Email link to a number of agency employees	Tests if agency provides email links to a large portion of employees.
I2d: Agency avoids dictating format or content of citizen communication, e.g., no preset subject or manual insertion of contact information.	Tests if agency attempts to reduce transaction costs in citizen-agency communications.
I2e: Provides an online issue-related forum for outsider participation eg. chat lines, and listservs.	Tests if agency provides a chat line or listserv for citizens, employees and others to discuss topics related to agency.
<b>Organizational Information</b>	
I3a: Provides link to listed sub-elements within agency	Tests if agency subdivisions are linked from the main page.
I3b: Provides link to sublevels noted in agency's organizational structure graphic	Tests if elements within agency's organizational graphic (such as area for president, vice president, etc.) are clickable.
I3c: Provides automatic update announcement or newsletter via subscription	Tests if agency has a subscription newsletter, either hard copy or email, which provides up to date information on agency activity.
<b>Issue Information</b>	
I4a: Link to outside issue-related government addresses	Test if addresses provided are clickable.
I4b: Link to non-issue-related government addresses	Tests if addresses provided are clickable.
I4c: Provides link to outside issue-related non-governmental information sources	Tests if addresses provided are clickable.
<b>Citizen Consequences/Responses</b>	
I5a: Provides any required submission forms onscreen for download	Tests if user can easily download any forms needed/required by agency for compliance with certain laws/regulations.
I5b: Provides online form completion and submission	Tests if user can complete and submit a form online to agency.
I5c: Provides an automatic response limit for response to online submissions	This attribute notes if agency tells user how long it will take until he/she receives a response from agency.
I5d: Provides link to appeal process for decisions and/or an ombudsman	Tests if appeals process provided is and easy to use.
I5e: Provides other language access to site for visitors unable to speak or read the language of the host country	Tests if site provides other language than principal language of the country. If country is officially multilingual, at least two official languages are used on site.
I5f: Provides iconographic access to site for visitors unable to speak or read the language of the host country	Tests if site provides icons or images that help users with limited reading or text processing skills to make rudimentary use of site.
I5g: Provides audio access to site	Tests extent to which site provides audio services, either for visually impaired users, or to capture verbal agency activities, such as hearings, presentations or speeches.
I5h: Disability access score: "Priority 1 Accessibility" and "User Checks" by Bobby	Tests extent to which site is accessible to disabled users, using evaluation criteria of the Center for Applied Special Technology,

## **Appendix 2. Citizen ICAM E-Mail Feedback (Response and Referral) Coding Scheme**

Positive Comments – Each e-mail was evaluated on its content. At some point, the author expressed some positive feedback on Citizen ICAM.

Negative Comments – Each e-mail was evaluated on its content. At some point, the author expressed some negative feedback on Citizen ICAM .

Questions: ICAM – Questions regarding the Citizen ICAM application, e.g., how are murders listed, criminal code definitions?

Questions: Procedure& Response – Some citizens asked general questions about the service or policing, e.g., why aren't homicides shown? Others are just general comments about crime. These general inquiries were combined into one category.

Current Case Problem – Some users sent in messages inquiring about current case status or to describe the problems they were having with officers handling their cases.

Technical Difficulties – Some users reported an inability to access the system in its early days or defined an inability to access certain parts of the maps. All of these inquiries were classified into one category.

Improvements – Some citizens sent in feedback for improving the system. All e-mails suggesting improvements are classified here. However, there were some improvements that were suggested by multiple users. These improvements have been given their own category. Should an e-mail contain these common suggestions, multiple categories, e.g., IMP and LI would both be checked.

Improvements: Legend – Some users suggested standardizing the legends between maps, i.e., as a user moves onto another map with more/less detail, the legend should remain the same.

Improvements: Data Length – Some citizens suggested lengthening the span of time a user is able to query. All such suggestions are categorized here.

Report Criminal Activity – Some users sent emails to report suspected criminal activity.

Home Purchase – Some users sent in feedback about using the system to purchase a home.

Other Jurisdiction Request – Some users inquired about using the system for other jurisdictions outside of Chicago.