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Communications of the Association for Information Systems

A Glimpse into Policy Informatics: The Case of Participatory Platforms that Generate Synthetic Empathy

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Abstract:

In this article we introduce policy informatics as an emerging research space. Policy informatics is the study of how information systems are leveraged toward solving complex public policy problems. We illustrate the role of human-centered participatory platforms in facilitating collaborative, and productive, deliberations on policy issues. When individuals and groups seek to collaborate to resolve policy issues, competing interests and adversarial positions on issues as well as an unawareness of the others' perspectives often result in poor outcomes. Generating and disseminating feelings of empathy among members in these networks is crucial for mitigating conflicts. However, empathy generation and transfer is a complex challenge that requires systematic research within the design of participatory platforms. A thoughtful application of information systems (IS) can help bring diverse stakeholders together and promote cooperation by facilitating richer communication channels and timely feedback to generate a sense of shared community to pursue shared goals.

Keywords: empathy; policy informatics; participatory platforms; governance; public policy; public administration; synthetic environment; information system design

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I. INTRODUCTION

In the 21st century, due to advancements in information, communication, and computational technologies, public agencies and governance processes have undergone a steady transformation. Policy making at all levels is increasingly handled through collaboration between state and non-state agencies [Kettl, 2000; Koontz and Thomas, 2006]. In the beginning of his administration, President Obama issued a memorandum that government should be open, transparent, collaborative, and participatory.¹ As a result, open and participatory initiatives are on the rise for solving complex social challenges [Desouza, 2012; Johnston and Hansen, 2011]. Public agencies are required to be transparent, collaborative, and participatory [Desouza and Bhagwatwar, 2012b] as they achieve their mission and serve the public. Advancement in information technology offers avenues for increased multidimensional (vertical and horizontal) interactions among diverse stakeholders for solving complex problems.

While information technology is increasingly becoming the intermediary through which people connect with one another, there is counterintuitive evidence that technology is also deepening the divide among people. Sherry Turkle [2011] in her book *Alone Together* argues that today we expect more from technology and less from each other. She contends that the increasing dependence on technology accompanied by depleting one-to-one interaction is resulting in a loss of trust and sense of belonging among people. Turkle asserts that using technology as a medium of interaction allows people to concentrate on other aspects of life than building social-interpersonal relationships with each other; thus, it scatters people in space and time. One could counter argue that technology alone enables connections, and the quality of connection largely depends upon the design of the platform. Thus, we ask in this research, can the design of the platform generate empathetic feelings among stakeholders to provide an understanding of the claims and interest of other stakeholders as legitimate?

In this article we introduce policy informatics as an emerging research space. Policy informatics is the study of how information systems are leveraged toward solving complex public policy problems [Desouza, 2011]. We illustrate the role of human-centered participatory platforms in facilitating collaborative, and productive, deliberations on policy issues. We focus on the critical concept of empathy. Empathy is the act of gaining insights into other people's lives, which allows a better understanding of others' situations and reality [Segal, 2007a]. Gerdes and Segal [2009] argue that the concept of empathy is one of the foundational elements for healthy relationships for humans interacting in any social system.

The concept of empathy is used widely and has provoked some considerable confusion [Morrell, 2010]. Confusion arises when scholars use the term "empathy" as synonymous with "sympathy." According to Segal [2007a], there exists a considerable difference between sympathy and empathy. In her view, when we empathize with other people, we open ourselves up to understanding others' opinions, thereby empowering them with the capacity to legitimately express their experiences and perspectives in a manner that directly impacts their current situation. On the other hand, when we are sympathetic to another group (e.g., poor), we endow them with charity to address their situation while maintaining social distance. The distinction between empathy and sympathy is crucial from a policy perspective. The concept of empathy is deeply rooted in the concept of democracy. Morrell [2010] argues that today's democracies are struggling to fulfill the promise of equal consideration, and this promise can be accomplished by privileging empathy with a central role in policy making. Empathetic individuals, if they are in decision-making positions, are more influenced by their understanding of others' positions and situations when choosing their own course of action [Segal, 2007a, p. 76].

On one hand, disciplines like social work, psychology, neuroscience, education, and so on, are using empathy as a useful tool for improving communication in face-to-face interactions; on the other hand, the concept of empathy seems to be negligent from the discussion of disciplines like IS and policy deliberation research. Although the concept of empathy is widely explored in face-to-face interactions, critics argue that technology-mediated collaboration platforms based on textual communication, such as discussion forums, are unable to capture these expressions and strip the richness of interactions upon which empathy is engendered. From this vantage point, IS discipline is far removed from other disciplines [Miaskiewicz and Monarchi, 2008], but technology-mediated collaboration does not have to result in thin communication. On the contrary, the advancement in technology offers a

¹ http://www.whitehouse.gov/the_press_office/TransparencyandOpenGovernment

growing toolset for engendering empathetic feelings between participants as people become more dependent on technology to interact.

The rest of the article is organized as follows. First, we provide an introduction to the discipline of policy informatics, outlining its dimensions and implications for policy deliberations. Next, drawing from different disciplines, we introduce the concept of empathy, and outline the role of empathy within policy informatics in facilitating enhanced conversions among diverse stakeholders. Following this, we outline the importance of understanding one type of information system, interactive computer simulations, when designing participatory platforms to generate 'synthetic empathy'. The article concludes with an outlook on the role of information systems research within the policy informatics agenda.

II. POLICY INFORMATICS: AN EMERGING RESEARCH SPACE

Policy informatics is the study of how computational and communication technology is leveraged to specifically understand and address complex public policy and administration problems and realize innovations in governance processes and institutions [Desouza and Johnston, Forthcoming]. It is built on the fundamental premise that information can be efficiently and effectively mobilized to enable evidence-driven policy design, implementation, and analysis in a legitimated governance environment. Policy informatics advances the goal of building public institutions that are transparent, collaborative, and participatory. Although a relatively new discipline, three distinct research clusters are emerging in analysis, governance infrastructures, and processes. Research within the analysis cluster focuses on: (1) harvesting data reservoirs to generate evidence; (2) visualizing information and relationships between heterogeneous information sets to make sense of a problem space; and (3) simulating and modeling complex environments to understand the efficacy of policy interventions under various scenarios and their associated outcomes. Research within the governance infrastructures cluster focuses on: (1) building the next-generation of public institutions; (2) designing open, collaborative, and participatory governance frameworks and platforms; (3) building participatory platforms to leverage collective intelligence; and (4) advancing the innovative capacity of public institutions with technology. Research within the processes cluster focuses on: (1) understanding how the infusion of technology changes policy processes and the individual and group levels; (2) infusing and provisioning information in, and around, administrative processes; and (3) leveraging the power of networks through technologies toward collaborative governance.

A focus on policy informatics is vital today for a number of reasons. First, there are no simple answers or easy interventions to solve grand social challenges. Complex information, multiple intervening variables, dynamic environmental conditions, and a multitude of diverse overlapping, legitimate, but competing stakeholders are found in almost all policy challenges [Desouza and Lin, 2011; Kim, Johnston, and Kang, 2011]. To truly devise interventions that have efficacy in these spaces is an ongoing challenge that requires an all-of-the-above approach. Today, we can model complex systems, design new platforms, engage multiple stakeholders concurrently, and study them to test out various strategies [Keller, Desouza, and Lin, 2010]. Hence, we can move toward evidence-driven policy interventions.

Second, policy interventions are costly, time consuming, and often irreversible. Costs range from the financial outlays, to reducing confidence in government because of opaque policy processes that disadvantage some, to the equally devastating negative impacts on the livelihoods of citizens. Leveraging technologies in the policy process can reduce the costs associated with decision-making, and helps decision-makers to take into consideration various perceptions associated with problems. Consider the case of the U.S. Census Bureau [Desouza and Bhagwatwar, 2012a], for whom mailing back census packages continues to be a challenge. During a census, 120 million questionnaire packages are mailed, and 134 million housing units are contacted by mail or in person. Each 1 percent increase in mail-back response rate saves taxpayers about \$85 million in door-to-door follow-up work. The advertising cost for a decennial census comes to \$1.20 per person in the United States. The cost to mail the census back is \$0.42 per household. But, if an enumerator is sent to knock on the door, that cost increases over a hundredfold to an average of \$57 per returned form. Through the use of technologies, the U.S. Census Bureau was able to save \$1.87 billion and come in \$1.6 billion under budget during the 2010 Census [Desouza and Bhagwatwar, 2012a]. Moreover, the Census Bureau was able to engage with the population in deeper ways than in prior efforts through leveraging technological innovations like social media platforms.

Third, technologies make available new platforms for public participation in the policy processes. Public deliberation involves the interaction between people and government agencies through mechanisms like discussion, critical listening, judicious argument, and earnest decision-making [Gastil, 2000] with respect to identifying solutions to shared public problems. Realizing the potential of public deliberation with citizens, government agencies have started to create forums to strengthen the dialogue between the public and government [Carpini, Cook, and Jacobs, 2004]. In addition to employing common methods, like open town meetings and public hearings, government agencies have started adopting technological solutions that promote dialogue between citizens and government

[Williamson and Fung, 2004]. Williamson and Fung [2004] identify several goals of public deliberation: (1) increase the character of participation by involving as many individuals as possible; (2) increase the quality of deliberation by allowing people from diverse backgrounds to express their opinions; (3) educate citizens and government officials with information, knowledge, and skills required to deliberate; (4) increase official accountability by asking government officials to explain their actions (or lack thereof) in specific projects or situations; (5) reduce the socio-economic bias of deliberation forums by selecting and recruiting population groups that are otherwise underrepresented; and (6) develop sustainable political and financial support for deliberation forums.

Through the advances in information systems, we are seeing an explosion in the number of technology-enabled participatory platforms for civic engagement. Government agencies are also exploring various participatory platforms and institutional arrangements that encourage citizens to engage in the policy making process. These platforms include online discussion forums, social networks like Facebook, smartphone-based applications, and audio/video capable websites. Consider two illustrative examples. The State of California's open government initiative² aims at providing citizens with access to government information and processes. This includes information on topics such as proposed city projects, state laws and acts, and upcoming open government meetings. In addition, the initiative also motivates government departments to initiate their own channels to solicit citizen opinion on policy issues. The California Unemployment Office and the Department of Motor Vehicles started using social media as a way to share information about offered services, and to solicit citizen opinion on how to make these services better [Howard, 2010]. The U.S. Department of Health and Human Services (HHS) and the Center for Disease Control and Prevention (CDC) employs technology platforms to create awareness about pandemics like H1N1. Increasingly, social media platforms like Facebook are used to inform people about pandemic situations like H1N1 in their locality. By employing discussion forums and online forms, these agencies receive innovative suggestions from people to prevent the spread of pandemics.

Fourth, the advancement in technology and trend toward collaborative governance pose challenges, yet offer opportunities for public agencies. The changing environment challenges public agencies to move beyond traditional top-down decision-making to more collaborative decision-making involving dialogue with non-state actors. This form of collaborative decision-making processes compels public agencies to develop relationships with non-state actors, and view public engagement with a different lens [Catlaw and Jordon, 2009]. From this vantage point, individuals in public agencies need to develop skill sets for effective communication for improving dialogue between state and non-state agencies. Particularly, this means managing multidimensional communication between, within, and outside public agencies, requiring management of massive information channels. In this light, the capacity enhancement will help government agencies to effectively regulate resources within private and public sectors for achieving high quality public service while serving the public intent that is as heterogeneous as the public. Simply put, public agencies have to take a proactive stance toward leveraging technology toward the solving of social problems and protecting a nation's interest and value, else they risk losing their relevance and legitimacy.

III. EMPATHY: A REDISCOVERED KEY TO SOCIAL INTERACTION

The concept of "empathy" as an integral approach to contemporary societal problems has gained traction in social work and developmental psychology [Gerdes and Segal, 2009]. Barker [2003] defines empathy as "the act of perceiving, understanding, experiencing, and responding to the emotional state and ideas of another person" [p. 141]. That is, empathy is the act of imagining and understanding the conditions and perspectives of another person related to a particular situation that demands an active response [Levenson and Ruef, 1992]. A lack of empathy among people has been tied to the core of many problems engulfing society [Segal, 2007a, 2007b, 2011]. Results from social work research indicate that people with high levels of empathy are civic-minded and become responsible citizens, whereas people who lack empathy exhibit destructive tendencies [Miaskiewicz and Monarchia, 2008; Segal 2007a]. Hoffman [2000] argues that humans automatically feel discomfort when they see other humans in discomfort. German sociologist Lipps [1903/1979] explained empathy as a psychological experience that is experienced by individuals while observing others, and some believe that empathy is a key component to personal growth [Segal, 2007a, 2007b].

Drawing from developmental psychology, Hoffman [2000] proposed a five component empathy model. He classified the five component model into two categories: (1) three automatic and involuntary (mimicry, conditioning, and direct association) and (2) two culturally influenced and cognitive (mediated and role-taking). He further argued that infants learn from their parents and surroundings; thus, empathy can be taught. Gerdes and Segal [2011] developed a three component empathy model: (1) the affective response to another's emotions and actions; (2) the cognitive processing of one's affective response and another person's perspective; and (3) the conscious decision-making to take empathetic action. Empathy is strong among people who identify similarities with each other and who share

² www.oag.ca.gov

their experiences with others [Ickes, 1993]. This human ability to empathize influences how people communicate feelings and interact with one another [Levenson and Reuf, 1992]. Human expressions, gestures, and body movements play a key role in communicating empathetic feelings in face-to-face communications.

While the traditional construct of empathy explored in social work research involves face-to-face communication, the developments in the later half of the 20th century marked a shift toward adoption of interdisciplinary research studies such as human-computer interaction (HCI), medicine, learning and education, psychology, and neuroscience. In the following section, we present some examples from aforementioned research studies to illustrate the use of the concept of empathy in building relationships and shared understanding.

Human-Computer Interaction

One stream of HCI specifically focuses on the importance of empathizing with a user's feelings as a crucial method of understanding the nature of user interface that would fit the user's needs [Black, 1998; Koskinen, Battarbee, and Mattelmaki, 2003; Wright and McCarthy, 2008]. For example, Fabri, Moore, and Hobbs [2005] studied the expression of emotions in instant messaging communications and its effect on user's involvement in the interaction. Fabri et al. [2005] conducted an experiment consisting of two conditions. In one condition, users interacted with each other with an instant messaging tool that allowed each user to have a 3D character representation or avatar capable of displaying facial expressions. In the second condition, users interacted with each other with an instant messaging tool that only allowed emoticons to express emotions during the online conversation. Emoticons are the small pictorial representations of one's feelings used in instant messaging tools. They found that when users interacted with each other with an avatar capable of depicting their emotions through facial expressions, users felt more involved in the conversation. Also, due to this empathic conversation, users enjoyed the interaction experience more than in the other condition.

When designing user interfaces it is important for designers to develop an empathic relation with the user. This empathic relation is highlighted by a multitude of ethnographic methodologies in HCI such as participant observation where the designer tries to understand the user's needs from a technology by empathizing with the problems the user is facing with the current way of doing work [Dourish, 2006]. Similar methodologies like personas focus on understanding the unique characteristics of the users who are more likely to engage with the to-be developed technology artifact [Wright and McCarthy, 2008]. In personas, the HCI expert creates a fictitious profile of a user who would possibly use an under development system or software. While creating the profile, the HCI expert describes the various characteristics of this fictitious user such as his age, job, family background, financial situation, and any disabilities. HCI experts create multiple such personas to understand how each of these users would use the software or system they are developing. The goal is to better empathize with users of the system and design software or systems which are more user centric.

Healthcare

The construct of empathy is crucial to understanding doctor-patient communication. For example, Irving and Dickson [2004] focused on the importance of empathic expressions in the doctor-patient communications. Patients value the relationship with their doctor, for which empathy is crucial. Patient-centeredness gives high importance to the doctor's capability of "entering the patients' world to see illness through their eyes" [McWhinney, 1989, p. 51]. Irving and Dickson [2004] suggest that it is possible for doctors to empathize with patients without explicitly expressing empathy to patients. Empathy does not necessarily have to be explicit communication consisting of words and statements in a doctor-patient relationship. Skilled health practitioners can convey empathy to their patients through behavioral components like longer eye contact, facial expression, closer seating distance, and forward leaning [Authier, 1986]. Similarly, Halpern [2003] emphasized the need for medical educators to recognize their patient's empathetic needs. He argued that while doctors have to strive to keep themselves detached from the pain of the patients in order to treat them, they have to ensure that the patients feel that the doctor cares for their suffering. This makes it important for the doctor to express empathy through many gestures, facial expressions, and examples of body language. Hojat et al. [2002] studied the importance of empathy to the patient-physician relationship. The authors studied 704 physicians in a health facility in the Philadelphia region to identify the components of physician empathy and the measurement properties. From the analyses of the data gathered through the surveys conducted for the physicians, the authors found that three factors—perspective taking, compassionate care, and standing in patients' shoes—are important to the patient-physician relationship. The term "perspective taking" refers to the physician's ability to empathize with the patient's emotions, and show understanding for his/her perspective toward the patient's health situation. While excessive sympathy could cause interference to objectivity in diagnosis and treatment procedures [Nightingale and Greenberg, 1991], compassionately caring about the patient and maintaining sympathy at a reasonable distance was identified to be beneficial to the patient-physician relationship. In addition, if the physician is able to understand the patient's situation and express that through appropriate gestures and expressions, it can further strengthen the patient-physician relationship.

Online Communities

Preece and Ghozati [2001] conducted a study to understand the role of empathy in online communities. They examined one hundred online communities to understand the influence of empathy in online interactions. They classified the communities as support communities, referring to communities that focus on patient support for various medical conditions, and other assorted communities, referring to communities that discuss many cultural, religious, or sports-related issues. A total of 2,000 messages from these communities were analyzed. They found that 81 percent of the communities contained some form of empathetic message. Their results illustrate that empathy in support communities is found to be extraordinarily high as compared to the other assorted communities that discussed religion, sports, and culture. In addition, the online communities containing a higher number of female members showed significantly higher empathetic communication.

Ickes [1993] defined empathic accuracy as the “ability to accurately infer the thoughts and feelings of another person,” which helps “to express these inferred thoughts and feelings in terms that match the actual experience of the other person” resulting in dialogue for “empathetic communication” (p. 591). People with shared experiences that are similar in terms of personal aspects build empathic accuracy [Feng, Lazar, and Preece, 2004]. For example, people with shared cultures or traditions or those who belong to similar occupations relate to each other's experiences, and are able to develop better empathetic accuracy. Developing technological artifacts or platforms that facilitate this process of identifying others who have similar experiences can be helpful in promoting empathy and developing interpersonal trust [Feng et al., 2004]. Platforms that enable people to narrate their stories and experiences can play a crucial role in the interpersonal trust building and empathy promotion. People search for others with similar experiences on such platforms so that they can interact with them and develop social bonding. The stories of personal experience act as a medium for people using the platform to relate to each other and develop empathetic accuracy. Online platforms with interaction capabilities promote avenues for sharing personal experience. In addition, such platforms that incorporate search capabilities allow people to seek out others with similar experiences [Feng et al., 2004].

IV. DESIGNING SYNTHETIC ENVIRONMENTS FOR GENERATING EMPATHY

Interactive computer simulations provide a medium for creating synthetic environments for participants to experience, perceive the situations of others, and recognize the claims of other members as legitimate, equally important, and not necessarily competing. These information-rich platforms serve as a medium for facilitating conversions to communicate empathetic feelings for building a shared understanding of the issues at stake. Thus, interactive simulations provide an environment for creating ‘synthetic empathy’ that offers participants a rich information-embedded platform for experiencing, perceiving, and coming to understand the feelings of others. Evidence from other fields suggests that empathy can be built and transferred through role-playing and mimicking [Gerdes and Segal, 2009; 2011; Hoffman, 1987, 2000; Segal, 2007a, 2007b, 2011], and the advancement in technology offers a new platform to leverage information among participants to deliberate on issues. Advancement in information systems provides tools for designing participatory platforms that can provide a contextual understanding of complex issues.

Interactive computer simulations represent dynamic social systems [Kriz, 2003], which provide innovative platforms for facilitating dialogue among diverse stakeholders [Barreteau, Page, and Perez, 2007; Camargo, Jacobi, and Ducrat, 2007]. Barreteau et al. [2007] argue that computer-based simulation and gaming have immense potential, and can be used as a training tool to improve required skills for collaborative decision-making. Policy games help participants to jointly explore the possible space, build a shared understanding of key concepts, and collectively and creatively search for solutions [Haung and Hutema, 2009]. Role-playing through computer simulations have immense potential in reducing the distance among players, and are best suited for raising stakeholder's awareness about complex issues. It also helps facilitate dialogue to build a shared understanding [Barreteau et al., 2007; Camargo et al., 2007].

Taking part in the exercise involving interactive simulations enables participants to “create self-referential conditions, whereby, each user's decision modifies the other users' environment and influences their own expected outcomes” [Barreteau et al., 2007, p. 187]. These forms of interactive simulations not only allow players to make decisions based on logical thinking, but the playful performance and interaction mobilize emotions and affection among players and reduce tension [Camargo et al., 2007]. Dray, Perez, Le Page, D'Aquino, and White, [2007] found that by taking part in the simulation, participants were able to distance themselves from extremists' views, which helped participants to adopt new perspectives to resolve conflicts among one another. Similarly, Dionnet, Kuper, Hammani, and Garin, [2008] found that by participating in a simulation activity, farmers were able to better negotiate with other farmers in the locality. Furthermore, through their participation in the simulation activity, farmers experienced improved understanding of the scope and contents of a joint irrigation project. In the simulation field, studies have

used role-playing as a medium to bring together diverse stakeholders' perspectives in a participatory learning environment [Jarmon and Keating, 2008] and affect policy outcomes [Haung and Hutema, 2009].

For learning purposes, interactive computer simulations can provide an "interactive-learning environment" in which participants can apply what they have just learned into the dynamic scenarios, receive instant feedback, reflect on what can be improved upon through trial and error, and explore alternative management practices and policy choices [Kriz, 2003, p. 505]. Thus, interactive simulation provides a rich platform for not only facilitating dialogue among stakeholders, but also presents information in a more compressible manner for an improved understanding of others' perspectives. Consequently, empathy can enable stakeholders to understand and positively respond to the fact that the claims and demands of others are legitimate, and not necessarily exclusive or competing.

Policy Informatics in Action: Designing Participatory Platforms with Synthetic Empathy

Within a technology-mediated platform, the feeling of understanding is conveyed in a subtle and implicit way via actions of support for opinions expressed and interactions that involve one person asking the other person how he/she is feeling. While gestures such as nodding or facial expressions are a means of conveying understanding in face-to-face communications, technology-mediated textual communications involve implicit actions, like support, as a way of conveying understanding. Pfeil and Zaphiris [2007] found that negative emotions expressed by the target, such as problems or worries, are the basis for empathy to occur. Empathy expressed by the empathizer also contains emotional experiences that relate to the target's problems or worries. For example, worries expressed by a person about tough financial situations could receive empathic responses in the form of similar experiences of other people and how they coped with the bad economic situation. The purpose of such emotional responses is not only to empathize with the target's situations but also to suggest a solution that could help the target deal with his/her problems. As such, emotions are expressed explicitly in online textual communications by both the empathizer and the target person.

Online participatory platforms like discussion forums provide people with an opportunity to discuss and inform about the problems they are facing [Pfeil and Zaphiris, 2007]. Often, the respondent is the person who has been through a similar problem. People who have common experiences share knowledge through online platforms on how to deal with a situation. This leads to generation of highly emotional and supportive discussions that create empathic contents on the online platforms.

We provide four examples to illustrate the role of participatory platforms in providing a medium to connect with one another. These mediums not only encourage participants to share their views but also connect with other participants who have experienced similar situations. Through their interactions, participants gain knowledge about the situation of others that leads to generation of empathetic feelings toward the other person. Our goal is to provide a glimpse into how a study of these types of information systems can lead to fruitful outcomes in realizing the goals of policy informatics.

Example 1: "WaterSim"³

WaterSim is an interactive computer simulation developed by Decision Center for Desert City at Arizona State University. WaterSim is a supply-demand model for the Phoenix metropolitan area designed to: (1) provide an understanding of the dynamics of complex water management for urban regions; (2) explore the effectiveness of water policies; (3) explore the uncertainties associated with urban growth and climatic conditions on water usage; and (4) explore complex decision-making processes associated with high levels of uncertainty.⁴ WaterSim allows a wide variety of stakeholders to deliberate on water issues pertaining to the Phoenix metropolitan area and adjust parameters to change climatic conditions, population growth, agriculture water use, and policy levers. Based on their adjustment of various parameters, participants receive instant feedback on the impacts of their decisions on future water availability within the context of other constraints and systems.

WaterSim can be used as an interface to design policy challenges that allow participants to make individual and collaborative decisions to evaluate the impact of their preference on future water sustainability in the Phoenix metropolitan area. In our simulation activity, we asked students to interact with WaterSim and deliberate on water issues. The students were divided into two cities—Phoenix and Surprise. The participants were informed about the existing disparities between the two cities. Phoenix, being a larger city, had more legal rights and, hence, had access to more water resources than Surprise (a smaller city on the urban fringes). The simulation activity included multiple rounds. In each round participants were asked to allocate water tokens as 'Water Budgets' to five categories: residential, industrial, agriculture, urban planning, and ecosystems. The simulation activity included an

³ <http://watersim.asu.edu/>

⁴ <http://dcdc.asu.edu/watersim/>

ultimatum game exercise motivated by game theory to test the impact of power differential on the collective outcome. As the participants continued the various rounds in the simulation activity, the participants' roles were swapped; the participants who were initially in a structurally disadvantaged situation were now in a position of power. The participants' roles were intentionally swapped to test if actions toward collective outcome changed after experiencing the others' perspective. The purpose of the simulation activity was twofold. First, this simulation provided students with the opportunity to collaborate in groups and deliberate on critical issues like resource allocation—to understand the complexities and decisions made under uncertain conditions for sustainable outcomes. Second, this scenario was explicitly designed to test the impact of power differential among stakeholders on the deliberation and ultimate outcome of the activity.

This simulation activity provides an example of how interactive computer simulations can provide a platform for designing simulation activities that can help participants to take on roles to understand, experience, and perceive the situations of others. The process of deliberation and collaboration imparts learning experiences to students, and makes them understand the complexities interwoven in making sustainable choices in a collaborative and uncertain environment. While deliberating on various policy issues related to water management, participants interact with one another; this interaction with other participants provides them with an opportunity to understand the claims and preferences of others. By recognizing the ideas and preferences of others as legitimate instead of simply self-serving or competitive, the simulation enables a rich dialogue between the participants and facilitates collaborative outcomes. Moreover, the decision-making process provides a learning experience to the participants, and helps them understand the complexities interwoven in a collaborative decision-making process.

Example 2: "I Paid a Bribe"⁵

I Paid a Bribe (IPAB) provides an online platform to the people of India for reporting incidents of public and private sector corruption. IPAB is funded by the Bangalore, India-based nonprofit Janaagraha (meaning "Public Revolution"), which aims to enable public participation in public governance issues. IPAB was developed to seek a better understanding of the full extent of corruption in India. Launched in August 2010, the website is recognized as an avenue for citizen engagement and an innovative way to track corruption [Janaagraha, 2010]. According to the IPAB website, since its launch in 2010 it has been visited by close to a million people.

IPAB has helped identify several key government departments plagued by corruption. The website allows people to anonymously report incidents where they had to pay a bribe. People describe the incident in detail, the context of the incident, and the amount of bribe they had to pay. In total, IPAB has collected reports of close to 15,000 bribery incidents, totaling to more than 400 million rupees (\$10 million). The website tracks corruption by department, city, and state level. The website also allows citizens to report any incidents where they paid a bribe as well as ones in which they did not have to pay a bribe and the work was done quickly. To identify government corruption, IPAB solely depends on the information provided by the citizens of India who come to the website to report any bribe they have paid.

In addition to providing a platform for citizens to report corruption, the IPAB website also incorporated a forum in early 2011 where citizens can post ideas to reduce corruption in government. Citizens post their idea in detail along with their opinion on how this idea would help reduce corruption. Visitors of the website not only read these ideas, but also suggest ways to improve the idea and its effectiveness in reducing corruption. In addition, people can also vote for the ideas they like. The top ideas that receive strong support and votes from other visitors of the website are then analyzed on a frequent basis by a panel of judges, often comprised of personnel from the Prime Minister's Office, Income Tax Department, and the Police Department. The panel then selects one idea that the Janaagraha Group works toward implementing. The citizen who posted the idea also receives recognition in the form of mention on the IPAB website.

The IPAB platform is an example of how empathy is exhibited on public technology-facilitated participatory platforms. On the IPAB website, citizens discuss the corruption incidents and relate to each other's experiences. By relating to each other's experiences, citizens feel connected and come to the realization that they are not alone in being a victim of corruption. In addition, through the discussion forum, citizens express and share their concerns about how such corruption incidents can negatively impact the nation's economy as well as society's moral values. The forum for expressing ideas for reducing corruption is an example of how empathy expressed through a citizen participatory platform can result into real action. By recognizing some of the ideas, showcasing them on the website, and by promising that these ideas will soon be seen in action, the Janaagraha group empathizes with the emotions of the citizens that visit the website.

⁵ www.ipaidabribe.com

Example 3: "Localocracy"⁶

Localocracy is a Web-based platform that allows people from a particular locality to discuss local issues, generate ideas to solve those issues, and select ideas based on the opinion of others. Initially available only for people in Amherst, localocracy eventually expanded to other localities in Massachusetts including Arlington, Cambridge, Granby, Milford, and South Hadley. During the initial phase of the localocracy project, only people who registered on the website using their voter identification and real names were allowed to discuss issues and contribute ideas. However, upon realizing the possibilities of innovative solutions that could be generated if people were allowed to post anonymously, the developers decided to enable this capacity. Localocracy not only provides a platform for citizens to discuss governance issues, but also allows them to contribute ideas to solve shared problems. The website harnesses the ideas and intelligence of the community to chalk out solutions to problems. Since people can also discuss and modify the proposed solutions, the platform also plays a crucial role in refining the innovative ideas proposed by people. Once citizens on a localocracy are confident about the success and feasibility of their solutions, they can go ahead and propose the solutions to the appropriate public agency. The selection, acceptance, and implementation of the solutions remain at the discretion of the public agency. After the initial success of localocracy and its adoption by an increasing number of municipalities, Huffington Post acquired the platform in October 2011 [Brown, 2011]. This adoption enabled localocracy to experience a rise in the number of visitors.

Localocracy is another example of how empathy sharing through participatory platforms can result into real action. A key factor that governs the success of these participatory platforms is effective citizen interaction and support for conveyance of empathy. Citizens on these platforms often are strangers to each other, and the only aspect that helps them empathize with each other is shared experiences. Citizens relate to each other's experience that they post on the platform. In addition, since the platform supports discussion, citizens then comment on the posts narrating their experiences in a similar context. Citizens also offer suggestions to others and share their knowledge about how they tackled a particular situation another citizen is facing. For example, if a citizen is having complaints with the process of getting a driver's license, she/he can post the issue on localocracy. Citizens who share a similar experience with the process, or have an understanding of the process, would reply to the post. The post could generate more interest and get the attention of other visitors who can empathize with any aspects of the post's contents. By relating to each other's experiences and understanding, citizens are able to generate ideas to resolve local problems of policy informatics.

Example 4: "SpeakUpAustin"⁷

SpeakUpAustin is a Web app that allows citizens to post any local problems and participate in discussions related to the problems. The app was developed and implemented by the City of Austin in Texas. The goal of the app is to engage citizens in matters of social interest. The app aims at generating innovative solutions to posted local problems by leveraging the knowledge of citizens. Various local problems are identified by the government authorities and posted on the platform. The identified problems are organized based on various categories like public transportation, utilities, and waste. Citizens can read any of the posted problems and propose ideas to resolve them. In addition, people can also vote for the posted ideas. The ideas with the highest number of votes get highlighted in the app. By generating awareness about local problems among the people, the government aims to foster citizen engagement for effective government decision-making related to local problems. The app aims to solicit participation primarily during the idea generation and voting stages. Implementation of a solution depends upon the availability of resources. Even during the implementation phase, the public agency encourages people to provide feedback and keep citizens updated about the progress of the project. The app was launched in the summer of 2011 and has already accumulated more than 1,300 registered users, more than 450 new ideas, close to 1,000 comments, and more than 4,500 votes on various issues in a short span of time.

V. DISCUSSION

As highlighted in this article, when individuals and groups collaborate to address policy problems, legitimate competing interests can enable conflicts to arise between members in the network. In this article, we discussed the role of IS platforms in facilitating deliberations for addressing complex policy issues. A thoughtful application of IS can help create communication channels and timely feedback for diverse stakeholders to discuss their viewpoints openly and understand the issues at stake. This can hopefully lead toward resolutions motivated more by collective action than perceptions of winning and losing. The four examples discussed highlight the role of IS in providing participants with a deliberation space to exchange ideas, understand each other's perspectives in the network, and connect with each other in addressing complex policy issues. This decision-making process provides citizens with an opportunity to experience the policy space, helps government to connect more with the public, and opens avenues to achieve the ultimate goal of democracy (i.e., returning power to the people while increasing

⁶ <http://www.localocracy.com>

⁷ austintexas.icanmakeitbetter.com

accountability [Desouza, 2012; Johnston, 2010]). The understanding of the influence of IS in policy making opens new opportunities for more interdisciplinary communication between researchers from public policy, public administration, and IS communities. Until recently, most work on empathy has focused on face-to-face communication as a medium for empathy generation. Further research is required to understand which affordances of face-to-face communication can be available in the synthetic spaces. Application of IS can bring a new line of investigation in advancing perspective taking among participants that are scattered in space and time. The construction of synthetic spaces opens up possibilities to teach people diverse perspectives through richer visualizations in addition to narratives and stories. There is a need to integrate findings from other disciplines such as social work, psychology, and education in designing synthetic environments. The IS designers need to be mindful of the human-centered designs and focus more on the people component in addition to the technology component [Miaskiewicz and Monarchi, 2008]. Consequently, more research in this direction will help develop frameworks for training IS designers to be mindful of the human components in designing participatory spaces for public deliberation.

Although there is a growing interest in the concept of empathy for addressing targeted social problems such as bullying [Szalavitz, 2012a], managing stress and emotional regulation ["Empathetic Children More Likely to Effectively Manage Stress, Behave Prosocially", 2012], and being mindful of others' perspective [Szalavitz, 2012b], further research is needed to understand the orientation of self within the perspective of others. There is a need to understand the tension between the individual self and others while teaching empathy, and more insights are needed about the influence of an individual's personality to develop effective tools for training individuals to be empathetic toward others. Also, it is important to understand what factors will affect individuals' empathetic response to others, and cases where individuals are likely to act empathetic. Addressing these streams of research will play an important role in building participatory space for policy deliberation. Mitigating conflicts within policy networks is crucial for encouraging open participation. Consequently, developing metrics for measuring empathy and changes in empathy requires greater attention.

More broadly, in keeping with the theme of the special issue, we have introduced policy informatics as a budding research space for IS scholars to pay attention to. Several researchers have called attention to the fact that the IS community has a responsibility to work toward designing a more sustainable and just society (see Desouza et al. 2006; Desouza et al., 2007). The grand challenges we face as a society are not going to get resolved without IS. Among the suite of grand challenges we face as a society, building inclusive, participatory, and collaborative platforms for governance remains one of the most salient. Simply put, without a capacity for inclusive governance that is built on public participation and thoughtful deliberation, we will not advance causes of increasing literacy, reduction in poverty, sustainability of our planet, and overall increase in the quality of life of the world's population. Policy informatics seeks to advance the study of how we design, implement, and evaluate computational and communicational technologies that advance the goals of participatory, collaborative, and transparent governance. Today, public managers and agencies are experimenting with technology, often with limited success. Consider three illustrative cases:

- Sometimes, in the mercurial world of social media, not responding can be the best answer. During Rahm Emanuel's campaign for mayor of Chicago, someone created a fake Twitter feed in his name at <http://twitter.com/mayoremanuel>. Many people and agencies overlook the importance of claiming their names in social media, often with embarrassing or regrettable results. In this case, the fake feed portrayed a fake candidate Emanuel's insight, with his legendary 'colorful' language, in a witty but expletive-filled Twitter feed. Some might say this was not really a social media mishap since it didn't hurt his campaign and even elevated his name among possible voters. Eventually, the fake feed was more popular than his office feed, and yet he coasted to win the election for mayor of Chicago.
- In December 2011, during his presidential campaign, Rick Perry released a YouTube video making a bold statement extolling Christian values and decrying gays serving in the military. Choosing social media as a vehicle to make a religious and social statement in a political campaign may have been ill-advised (and it was reported that it was advised against by a staffer⁸). Within hours of the release, a 'gay Perry' meme was born. The reaction was documented on YouTube, where voters can vote a video up or down. In real time, Perry was able to gauge the reception of his ad campaign, for better or for worse. Within two days, the ad had garnered more than 300,000 reviews but 98% of them were negative. The poor reception of the video and the incredibly negative rating became the story, instead of Perry's message. By the third day, the

⁸http://www.huffingtonpost.com/2011/12/08/rick-perry-anti-gay-iowa-ad-divides-top-staff_n_1136587.html

campaign had disabled the 'like or dislike' function on the YouTube video,⁹ but not before the video spawned a cohort of dissenting responses, both in video and in image, and grown into a full-blown meme.¹⁰

- General Services Administration's foray into crowd-sourcing information via Wikis and social media has been criticized for lax involvement and oversight. Spam, inappropriate comments, and even malware links left on the sites due to inadequate moderation diminished the value of the resources. The invasion of spam on a social media site creates the sense of neglect and also impedes users finding actual useful information,¹¹ not to mention diminishing the reputation of the host agency.

These are just some of the many examples that show us how communicational technologies are being utilized before being understood. Research should influence practice. Toward this end, policy informatics is applied in its focus. It is not focused on simply arriving at theoretical knowledge, but like Simon's [1969] view of the Sciences of the Artificial, it seeks to influence design and practice. Policy informatics embeds its stakeholders within the research programs. The value of a policy informatics research project is gauged by how the knowledge benefited stakeholders toward the end of building platforms for inclusive, collaborative, and transparent governance.

VI. CONCLUSION

To navigate the issues and challenges of complex policy deliberations, we need to broaden the conversation among diverse communities and policy makers to recognize the claims of other members as legitimate. In other words, to have an understanding of the situation of others, we need to design platforms for collective deliberation to resolve complex and policy challenges affecting interdependent communities. In this article, policy informatics is presented as an emerging research space to navigate through the challenges of complex layers of uncertainty within governance processes. We believe that research streams from the IS domain could benefit public administration and policy research in ways that would lead to a richer understanding of the role of IS in public policy and governance. The field of policy informatics enables us to leverage information in previously impractical ways, and facilitate authentic and useful deliberation among diverse stakeholders. Blending new forms of technology allows for the creation of synthetic environments that mimic real life situations, and provides an opportunity to understand the claims of other stakeholders. Empathy as a concept illuminates the capacity to understand the experiences and perspectives of others related to a particular situation. Through our discussion of the concept of empathy, we highlight the role of technology in creating synthetic environments to afford participants the ability to understand the situation and perspectives of others. Finally, we argue that synthetic environments are dynamic representations of reality that provide a unique participatory platform for fostering and disseminating empathy among users. These platforms enable the inclusion of others in policy deliberations, thereby allowing participants to experience and perceive the problems faced by other members. This helps them identify shared value spaces and collectively deliberate on complex public issues of their interest. Although technology enables connections, the value of these connections is realized through the design of the platforms. The potential benefits of technology depend upon the design of the participatory platforms; if we want to realize the potential of a more connected society, it is necessary to consider the quality of the connection and the empathy they engender.

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⁹<http://blog.chron.com/rickperry/2011/12/using-youtube-perry-proves-to-be-all-thumbs/>; <http://blog.chron.com/rickperry/2011/12/new-perry-ad-disables-the-dislike-button-on-youtube/>; <http://blog.chron.com/rickperry/2011/12/the-blowback-from-perrys-ad/>

¹⁰<http://knowyourmeme.com/memes/rick-perrys-strong-ad/>

¹¹http://fcw.com/articles/2011/10/05/gsa-wiki-spam.aspx?sc_lang=en

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