Discovering the appropriate role of serious games in the design of open governance platforms

2 authors:

Tanya M Kelley
University of Michigan
9 PUBLICATIONS   **3** CITATIONS

SEE PROFILE

Erik Johnston
Arizona State University
38 PUBLICATIONS   **387** CITATIONS

SEE PROFILE

Some of the authors of this publication are also working on these related projects:

Project

Promoting Empathy and Collaborative Decision-Making for Natural Resource Management using a Computer Mediated Scenario View project

Discovering the appropriate role of serious games in the design of open governance platforms

Tanya M. Kelley
Erik Johnston
School of Public Affairs
Arizona State University

Abstract
Advances in communication and computational technology have drastically increased opportunities for the public to participate in governing activities. Well-designed responsive participatory pathways can encourage individuals to take action on issues that are important to them while receiving value and enjoyment in contributing to the overall welfare of the state. However, many crowdsourcing programs do not achieve their intended targets or goals in part because people have little motivation to participate. Serious games are examined to address this challenge as they involve the integration of intrinsic human motivators with game mechanics or game dynamics into a website, service, community, campaign, or application to drive participation and engagement. Governments can supplement open governance platforms with characteristics of games to reshape and invigorate public participation if individuals have opportunities to participate through channels that are collectively and individually rewarding. Drawing on theory and an emerging body of examples this manuscript creates a framework for how governance organizations can integrate serious games into the design of open governance platforms to improve the understanding of how the platform affects the working relationship with the public when solving collective challenges. Contributions of serious games are how to foster dialog, educate, solicit feedback, and mobilize individuals. In identifying the characteristics that differentiate early projects that have succeeded with those that have struggled, we provide recommendations of how to cultivate voluntary and enthusiastic participation in open governance platforms– giving the public the opportunity and motivation to have an impact on the communities in which they live just as many already do in the virtual worlds in which they play.

Introduction
Public participation is a key component to democratic government. Though the form of participation may vary, such as representative versus direct participation, the ability for individuals to interact with their government is both a desirable and necessary part of governing operations and government legitimacy (Arnstein, 1969; Innes & Booher, 2004; Roberts, 2004). The development of communication and computational technologies has made direct participation more feasible and given rise to interactive platforms that enable direct interaction (O'Reilly, 2010). Though technology makes participatory opportunities available, sometimes they are unused or used in a way that was not intended by the sponsoring organization (Lampe, 2011). Thus, to realize the potential for novel participatory pathways, we must also take into account the motivation of people who participate. Our objective in this exploratory research is to develop a framework for identifying characteristics and applications of serious games in open governance platforms. We pull from two sources of information in the framework development: theory on serious games and civic engagement and current examples of both successful and struggling programs.

1

We begin our examination by reviewing literature on public participation and requirements for making participatory opportunities worthwhile to citizens with fixed personal resources. Applications of information tools associated with E-government have become a standard practice. They improve public-government interactions, but their traditional structure has limitations for participation. We catalog an emerging body of the open governance platforms that have been created to address challenges in public and private organizations in public deliberation, task completion, and learning, all of which encourage the voluntary mobilization of individuals to engage in a participatory activity. Within each category, we compare examples that use crowdsourcing exclusively in comparison to crowdsourcing programs that include a serious game layer.

By crowdsourcing, we are referring to an increasingly common approach where a large group of people contributes to solving problems or challenges usually posed by public and private organizations, "…a [crowdsourcing] system enlists a crowd of users to explicitly collaborate to build a long lasting artifact that is beneficial to the whole community" (Doan, Ramakrishnan, & Halevy, 2011, 87). Its primary contribution is the ability to coordinate or focus large and diverse population of contributors to collaboratively address on topics or activities that interest them. The inclusion of the word crowd is very appropriate- the numbers of participating individuals are quite large on some of these platforms. For example, the English language *Wikipedia* currently has 14,500,244 users, only 1,786 of which are designated as administrators, and the site is visited by an average of 78 million people monthly (Wikipedia, 2011). Contributions from individuals are mediated by the collective, thereby reducing errors in the final product produced.

Games have a unique contribution to participation; they have a dynamic structure that is designed for entertainment and can motivate to the point where people are willing to dedicate their leisure time to participate in games. Games are pervasive throughout society and individuals are well acquainted with both games and game dynamics. Furthermore, *serious games* are a category games that have an objective beyond the entertainment of the moment; individuals can learn how to plan, build, lead and mediate depending on the game design, also known as the game frame (Dignan, 2011). Collaborative platforms that incorporate serious game dynamics in addition to crowdsourcing with a focused objective are emerging in both the public and private sectors. However, platforms that use gamification[1] are not guaranteed to be successful; therefore, requirements for and barriers to successful implementation must be thoughtfully addressed. In addition, Parent, Vandebeek, and Gemino (2005) find that government must engage citizens online with high preexisting levels of trust in government to be successful; rather than working on developing sites, the focus for public administrators and elected officials should be developing a trustworthy relationship with citizens. If citizens are going to engage with government online, the perceived ease of use, compatibility, and trustworthiness of the sites are significant in their decision to interact (Carter and Belanger, 2005). Studying the design and integration of open governance platforms with serious game characteristics can contribute to our understanding of what motivates the decision of individuals to participate in open governance platforms and how organizations can use serious games in their governance platforms to improve and maintain a high quality working relationship with the public that is mutually beneficial.

---

[1] The process of serious games being used in real world platforms has been referred to as gamification.

The Evolving Relationship between Public Administration and Public Participation
Early public administration literature focused on improving the integrity and processes of government institutions through formalizing operational structures and having public professionals carry out daily business in an efficient manner ranging from private professional to an integral piece of an interconnected machine (Wilson, 1887; Weber, in Shafritz & Hyde, 2007). This conception of public service kept individuals and government separate. Even with a separation between citizens and government established, there has been debate on the most appropriate articulation of the relationship. For example, New Public Management argues that efficiency is a primary tenant of good government and that an effective administration would operate with a performance motivation component incorporating business practices from the private sector (Rosenbloom, 1983; Lynn, 1999). An issue with the perception of people as clients in the New Public Management movement or vending machine model of government (Kettl, 2009; O'Reilly, 2010) is that people act in a passive manner, expecting to be served rather than actively working to be a part of the process (Vigoda, 2002). Individuals were considered to have a different role in the new public service. In this view the public sector cannot be managed like the private sector due to different perspectives and priorities, and that individuals are regarded as citizens rather than clients (Denhardt & Denhardt, 2000). As governments are forced to do more with less, directly engaging the public as a public resource becomes less of an option and more of a necessity. According to Innes and Booher (2004), participation is legally enforced in a democratic government and serves to inform them about citizen preferences, improve decision making through inclusion of local knowledge and context, continuing to improve the equity of government, and increase legitimacy for public decisions. A few examples of traditional participation include serving on juries, contacting public officials, and attending meetings or serving on commissions (Arnstein, 1969; Roberts, 2004). Public participation can include activities that can be used by public administrators in their service.

A different perspective on public participation to consider is that of the participant. If a member of the public is going to engage with a public organization, the benefit from participating in the activity must be clear. It must be understood that willingness to participate in any governance process is impacted because of access to personal resources such as education, income, time, and personal characteristics (Brady, Verba &, Schlozman, 1995; Huxham &, Vangen, 2000). In addition, individuals will be less likely to put the public interest ahead of personal desires if they feel they have no impact on the system (King & Stivers, 1998). Participating must contribute something that makes busy individuals willing to contribute their time and attention. For instance, participation may impact their power in the public arena. Arnstein (1969) explains how participation is linked with power. "It [participation] is the redistribution of power that enables the have-not citizens, presently excluded from the political and economic processes, to be deliberately included in the future" (Arnstein, 1969). Members of the public may be interested in a specific policy and want to be included rather than communicating support or opposition to an administrative agency that works on the policy (King, Feltey, & O'Neill, 1998; Irvin &, Stansbury, 2004). If the public is interested in working on policy areas of interest, they also need to know their contributions are essential to the process of developing and articulating policy proposals (deLeon, 1992; Fischer, 1993). For the public to know that their contributions are

3

valued by public institutions, feedback is essential. It has been found that feedback of any kind, including negative feedback, is more useful at encouraging additional participation than receiving no feedback (Kluger & DeNisi, 1996; Lampe & Johnston, 2005). Public institutions have created opportunities for feedback from citizens, but due to volume and current structures, feedback is not usually integrated into practice (Reich, 2010).

Healthy forms of participation make the work of governance more of a collaborative partnership rather than having a large number of citizens observing current events and feeling powerless to impact the outcome. Thomas (2010) found that the public can be effective partners if administrators have a clear understanding of how individuals can assist on specific tasks or services. This indicates that new forms of participation can be developed by public organizations that increase the availability and diversity of tasks the public can be involved in. Resources, such as a consumer engagement toolkit, have been developed to help public organizations understand the potential contributions of citizens and to communicate that information to audiences within and outside of their respective organizations (Andersson, Fennell, & Shahrokh, 2011). There have also been examinations of the history of active citizenship specifically and its role in public administration, such as Bryer's (2011) comprehensive discussion for the National Association of Schools of Public Affairs and Administration where he demonstrates that direct citizen participation is a relevant issue for future and current scholars and practitioners in the field. Enabling individuals to have a substantive impact on issues that matter to them can activate an extensive and motivated human resource pool that can work to solve problems (McGonigal, 2010). This potential human capital available for governance challenges is what we consider to be the democratic surplus of a state.

E-Government and Public Participation
The relationship between governance organizations and the public has been changing due to use of the internet as a medium for communication and interaction, leading to new behaviors and expectations for both. There is a rich literature dedicated to technology and governance, but for the purpose of this research, we will be providing a targeted discussion of how E-government has impacted public participation. There are limitations in face-to-face participatory activities. Innes and Booher (2004) discuss how structural elements such as time limits, set agendas, and interpersonal reactions like the attention level of committee members make participation difficult. E-government, the application of communication and computing technologies to governing activities, has expanded how public service is provided and has reduced some of the barriers to incorporating public participation in governance (Roberts, 2004). The internet and its array of tools and platforms have changed the way the public communicates, conducts business, and finds entertainment. It is now standard practice for public information to be available online. President Obama effectively utilized online social media resources to introduce himself, his positions, and his objectives to citizens during his run for presidential office in 2008. A functional E-government model consolidates information and enables online interactions, such as cataloguing, transactions, vertical and horizontal integration (Layne & Lee, 2001), and political participation (Moon, 2002). E-government gives people increased control on when and where they access public organizations. "The nonhierarchical character of internet delivery frees citizens to seek information at their own convenience, not just when a government office is open" (West, 2004). Public service, in a very real way, is now an 'always open' experience thanks to online access.

4

Online tools have changed or expanded the services public organizations provide, but that does not mean that there are not limitations in using this tool. One issue with E-government is that individuals must have technological and government literacy to effectively use the resources provided online (Bertot & Jaeger, 2008). The entertainment value of participatory platforms also impacts the public's willingness to participate (Garris et al., 2002). Another challenge is when participatory activities online are underused. Lampe et al. (2011) describe the disappointing outcome from the *AdvanceMichigan* project – a crowdsourcing site intended as a feedback platform for the statewide policy and service agency, the Michigan State University Cooperative Extension (MSUE) 2010 needs assessment. Though the intent of the site was to expand feedback opportunities for Michigan residents, the site only had only 900 people participate compared to 10,000 when using traditional survey methods and the participants were disproportionately MSUE employees rather than members of the public. The success rate of E-government platforms impacts expanded use by citizens. Heeks (2003) reports working estimates of the status of E-government projects; at the time this paper was produced 35% of projects were characterized as total failures, 50% as partial failures, and 15% as successful. Though this exact distribution will have changed from 2003, the trend indicates that there are more failed E-government programs than successful ones. Implementation, economic and technical factors also impact the effectiveness of online programs (Evans & Yen, 2005).

It is important to keep in mind that online tools are part of the overall relationship between the public and governing institutions. Welch et al. (2005) notes that E-government platforms are impacted by citizen trust in government. Therefore, evaluation of the tool can be framed in the context of improving or hindering the core relationship. The format of public websites is relatively standard and the primary purpose is to provide information. This design establishes a dynamic where power resides with the institution rather than the individual. In some cases, the traditional format of online sites increases the burden on public organizations to effectively serve their constituents. For example, Schact (2009) characterizes the communication that legislators receive on a daily basis through phone and online medias as an overwhelming amount of correspondence from citizens leading to a "never ending stream of advocacy" (154). The current design of interactions lends more to the vending machine model discussed above rather than a collaborative partnership. Paving over existing pathways of government participation with new technology is like investing in a bridge to nowhere, where there is little satisfaction from either citizens or government (O'Reilly, 2010). However, public organizations are beginning to expand their use of online platforms to create a more dynamic interactive space for the public. O'Reilly (2010) states that as society embraces using social networks to connect both in the physical and virtual world for civic purposes, government can use the power of E-government technologies to improve its service to citizens, developing an era of service he calls 'open government.' The following section is an examination of how games can improve open governance platforms. Games are designed to simultaneously challenge and entertain participants and can become a useful part of online governance practices.

Motivation to Participate: The Unique Contribution of Games to Participatory Activities
Recently, there have been programs created by government and nonprofit organizations that explore using games and game dynamics to encourage the development of increased

5

participation of the public. Games can be defined as "…a structured and challenging system that makes the process of learning rewarding, enables deep engagement, provides a sense of autonomy, and asks us to be heroes in our own stories" (Dignan, 2011, 3). As a medium they are dynamic in how they communicate, motivate, and encourage desired behaviors and reward participation. Games are designed to be entertaining to encourage participation. There are four common characteristics of games: goals, rules, feedback systems, and voluntary participation (McGonigal, 2011). There is also a term for the process of incorporating games into the operational practices of an organization – gamification. Gamification is the integration of intrinsic human motivators with game mechanics or game dynamics into a website, service, community, campaign, or application to drive participation and engagement (Mackie-Mason, 2011). The following discussion will explore how the inherent characteristics of games contribute to our understanding of motivation to engage.

One of the useful aspects of games is that people have an understanding of the rules. People play games of all types throughout their lives and are adept at responding to them even if they do not articulate the activity as a game. The popular and well known event of happy hour is an example of an appointment game dynamic where the only requirement to win the 'prize' of a discounted drink is to purchase the drink at a predetermined time and place (Priebatsch, 2010, 4:25). People are accustomed to making strategic choices in their leisure time to give them an advantage in life. Students participate in extracurricular activities, volunteer, belong to community groups, and apply for scholarships that may give their application an edge over their peers when applying for college. People also know that games have varying scopes and can range from finding a date at a speed dating function to solving a complicated problem in the workplace.

Games have long proliferated society, particularly in sports, games of chance and video games. Collegiate and professional sports have an increasingly large and passionately engaged following, even though fans can only observe the games. To discuss one sport on a national scale as an example, 34,014,344 attended the 2010 season National Football League games (NFL Attendance, 2010). These numbers reflect physical attendance at stadiums, not including the number of people who watched the games on television or online. Individuals not only follow sports but also create their own games through fantasy sports – games on top of other games. PricewaterhouseCoopers predicts that the United States will collect revenues exceeding $68 billion from regulation of online gaming by 2014 (Schooler, 2010). This projected gaming revenue mirrors the amount of time that people are investing in playing games.

The prevalence and popularity of online gaming may be due to the expanded role participants have to directly shape the games in which they play. Shirky (2010) notes that individuals are no longer satisfied solely receiving controlled entertainment through television. Now there is demand for interactive entertainment where people can create new kinds of entertainment or interact with the content in programs they encounter. One of the best known and most popular online games is *World of Warcraft*. The game's website characterizes itself as a massively multiplayer online game (World of Warcraft, 2011). The site aptly describes the term 'massive multiplayer' as follows: "Most multiplayer games can accommodate anywhere from two up to several dozen simultaneous players in a game. Massively multiplayer games, however, can have thousands of players in the same game world at the same time, interacting with each other (World of Warcraft, 2011). There are currently around 11.5 million people who subscribe to play

World of Warcraft (McGonigal, 2011). Similarly, Sid Meier recently has expanded his popular console game *Civilization* to the social media site Facebook, thereby expanding the popular game to a new audience with a medium that can access potential players from young children to grandparents (Frum, 2011). Another example is *LostPedia*, a wiki devoted to solving the mysteries of the television program *Lost*. Many hours of work go into the creation of projects like *LostPedia*, due to interest rather than a sense of obligation (Lostpedia, 2011). Finally, *Farmville* is a game where people harvest and cultivate crops online and has an estimated value of $2.16 billion (Foremski, 2010). Shirky (2010) discusses how people are using their free time to participate in such projects because it is entertaining. Any work that is done on leisure projects is to due to interest and desire; he terms this effort part of the 'cognitive surplus of society.' Cognitive surplus demonstrates that people are willing to expend time and energy to participating in a variety of projects because they are of personal interest.

Because individuals enjoy playing games, they will invest effort and study to become successful. Well designed games use the application of goals that focus the attention and energy of individuals, improve their persistence, and lead to discovery of relevant knowledge (Locke & Latham, 2002). By some estimates, people collectively spend 3 billion hours a week playing video games and, by the time kids today turn 21, they will have spent an average of 10,000 hours playing video games (Zimbardo, 2010). This is roughly the same amount of time a student with perfect attendance will spend in school from 5th grade to high school graduation. This is equivalent to the same amount of time psychologists claim it takes to become an expert at something (Gladwell, 2008). McGonigal (2010) claims that the time and effort contributed to mastering games has trained players to be super-empowered, hopeful individuals who are highly capable at collaborating and solving problems. The excitement and dedication of playing games leads to a unique kind of personal empowerment that can be instructive in understanding why individuals become motivated to participate in an activity.

Gaming fosters intense passion, work ethic, and collaboration in its participants, which has the potential to increase empowerment. Empowerment can be defined as "…a multi-dimensional social process that helps people gain control over their own lives (Page & Czuba, 1999). The challenging structure of games Gee (2003) discusses why well designed games are so popular with people: "Good games operate at the outer and growing edge of a player's competence, remaining challenging but do-able…they are often also pleasantly frustrating which is a very motivating state for human beings" (2). McGonigal concurs that players enjoy solving challenges within games; she defines blissful productivity as when individuals achieve greater happiness contributing to meaningful work than when relaxing. People are "motivated [in games] to do something that matters, inspired to collaborate and cooperate, and when in games world, I believe we become the best versions of ourselves, the most likely to help at a moment's notice, the most likely to stick with a problem as long as it takes" (McGonigal, 2010, 3:34).

McGonigal (2010) speaks about online games having powerful beneficial characteristics that can be applied to solving real world problems. Her TED lecture focused on communities of online gamers and their perspectives on games and the real world, arguing that gaming cultures lead to super-empowered hopeful individuals within the frame of virtual worlds. "These are people who believe they are individually capable of changing the world, and the only problem is that they believe they are capable of changing virtual worlds and not the real world" (McGonigal, 2010,

7

11:02). McGonigal designed games based on real world problems to create links between games, participation and real world problem solving because of a common feeling of urgent optimism. "Urgent optimism is the desire to act immediately to tackle an obstacle combined with the belief that we have a reasonable hope of success" (McGonigal, 2010, 9:03). With the belief that success is possible, participants in the games feel empowered to expend effort and time and to collaborate with others to achieve this goal. Gamers also receive positive feedback and so are encouraged to develop skills and become an increasingly central participant in this community of practice (Lave & Wenger, 1991). The motivation to succeed at a game can be used to give citizens the confidence and the vehicle to contribute to solving real world problems.

The role of games is expanding beyond the realm of entertainment. Serious games have been used as a tool to improve business operations in private industry, education, and other professional disciplines. Such tools have the advantage of the dynamic structure that attracts people to participating in games, but are framed in a way that leads to constructive and innovative contributions. Serious games have a different focus from traditional games, regardless of structure. They also differ from crowdsourcing, though they possess shared characteristics. Other games can be an intellectual escape that takes the player out of the real world. Participants are not limited by things that would impact them in life- it is sometimes easier to be an elf battling a demon than to worry about balancing the budget or solving world hunger. Serious games are designed to keep the player in a universe that can be fictional but is based in the real world, such as Oregon Trail or SimCity. A consistent conception of serious games is that they are interactive and challenging and are intended for a purpose beyond immediate entertainment (Aldrich, 2009; Dignan, 2011). Engaging in the game encourages development of skill sets that are applicable beyond the scope of the game.

Examples of Current Open Governance Platforms
New examples of open governance platforms are emerging daily. The platforms enable a large group of individuals to jointly work together to solve a focused challenge or task in society. The presented platforms exist in the public and private realm and each represent a unique way in which crowdsourcing can be use to develop solutions. The challenges incorporate collaboration and/or competition in their infrastructure. Another consistency is a constructive framework. People are challenged to experiment, build, find, or fix something. The following sections will examine governance challenges in public deliberation, task, and learning categories and elaborate why participation in this area matters. A common characteristic of each platform type is that participants are mobilized through their participation, and the decision to participate is voluntary. Current examples of open governance crowdsourcing platforms will be presented as will similar structures that include an additional serious game layer in their design. The purpose of this section is to demonstrate how open governance platforms are currently being used as individuals and organizations experiment with the expanding depth of online platforms. There will also be a discussion of businesses whose primary function is to design platforms for organizations.

Deliberation
A constant challenge in a democratic society is maintaining a healthy flow of deliberation between government and citizens. Merrifield (2002) argues that deliberation should be available

to all and provides a useful definition of what deliberation is comprised of: "Deliberation requires both voice and listening, both negotiation and compromise along with influencing others" (5). We will use this definition of deliberation in the following section. One function of deliberation platforms is their focus on improvement of the working relationship between an organization and individuals leading to improved service through dialog. In addition, citizens may contribute to identifying developing problems and contributing to finding solutions that are relevant in the present or may be in the future. This vehicle of participation assists in the strengthening of government legitimacy (Roberts, 2004).

One of the primary contributions of E-government platforms is increased transparency. For example, the *Missouri Accountability Portal* presents financial information on purchases and expenditures for the state in an easily searchable format (Missouri, 2007). Great Britain has created a similar fiscal transparency platform by making public expenditures exceeding £25,000 available to the public online (BBC, 2010). This effort has placed citizens in the role as fiscal watchdogs and has led to tensions between the citizens and government. Michael O'Higgins made the following statement about this process in the United Kingdom, and the trend observed will likely be a common phenomena at initial uptake if programs have a similar structure: "It will allow ordinary citizens to ask legitimate questions about spending, questions which will become an irritant to government departments, but I think a legitimate irritant, as citizens seek to find out what money was spent on" (BBC, 2010). Other programs focus on more active communication interactions between individuals and organizations. *Uservoice* is focused on increasing dialog between customers and businesses through feedback and helpdesk tools (Uservoice, 2011). The intent of this interaction is to improve the services that private industry provides to clients. *IdeaScale* is also focused on the relationship of business and customers, but the objective of this site is to allow the ideas of customers to be developed and discussed with potential for adoption by participating businesses (IdeaScale, 2011). *Opinion Space* is a site with a similar dialog platform as *Uservoice* and *IdeaScale* but with a greater focus on interactions between citizens and government instead of clients and businesses (Opinion Space, 2011). The emergence of these platforms demonstrates that it is not only new ideas that matter, but also the relationship between ideas, individuals and organizations. People and processes will have a direct impact on the longevity of serious games as a participatory medium.

Other citizen-government communication sites have an action focus, more in the vein of problem identification than exploration. The site *Fix My Street* allows citizens in their community to send updates on broken infrastructure as the message is delivered to the city council (Fix My Street, 2011). Citizens guide their local councils to the location of problems, increasing response time and saving government resources. The local structure leads to ideas of citizen interaction with elected officials in their communities. A program with a similar structure is the *NYC BigAppsIdeas* where the city can create applications for improving the city based on suggestions from the public (NYC, 2011). The suggestions are rated by judges and the top twenty five suggestions receive a financial award; the suggestions are diverse, ranging from requests for applications to learn more about the city's history to city rules and regulations, such as "I want an NYC app that has a visual, color coded map of all street parking rules, regulations and street cleaning schedules."

Communication mediums can increase efficiency by enabling the public to assist in pointing out

faulty physical infrastructure or provide insight into what services are desirable and would be beneficial to residents, businesses or visitors. Another exploratory platform is *ScienceforCitizens.net* that allows non-professional but enthusiastic individuals to interact through research projects and other recreational excursions (ScienceforCitizens, 2011). Crowdsourcing within these participatory platforms not only allow individuals to propose ideas for innovation in service, but contributions from an individual can be improved by the group through additional suggestions or illumination of flaws that eventually improve the quality of the suggestion, moving the solution from a simple idea to a more sophisticated one that could be feasibly implemented.

Crowdsourcing platforms with serious games have been developed that enable participants to develop new solutions to challenges presented within the frame of the game. The solutions are not restricted to current challenges but can address issues that may develop in the future. One serious game example is *Superstruct,* a game created by the Institute for the Future. Its premise was that the world would end in twenty-five years. The game asked participants to collaboratively develop ideas for how people would be able to survive on the earth; over five hundred ideas were developed over the duration of the game (McGonigal, 2010, 17:26). Another futuristic real world game scenario is *World Without Oil* that frames the challenge by explaining that the demand for oil worldwide has exceeded the global supply; participants were challenged to operate in the game as if they were going through life with an extremely limited amount of available oil (McGonigal, 2011). McGonigal (2011) reported that the participants had a change of focus when playing the game from a negative outlook to a more positive one: "About halfway through the game, having exhausted their dark imagination, players began focusing on potential solutions. They started imagining best-case scenario outcomes: new ways of cooperating to consume less, a focus on local community and neighborhood infrastructure, less time spent commuting, the geographic reassembly of extended family, and more time spent in pursuit of a new American dream – happiness build around notions of sustainability, simplicity, and stronger social connectivity" (308). These games thrive on collaboration and constructive, specific solutions were developed to address the larger problems presented. The big contribution of a game frame in this context is the inclusion of a fantasy element; the fact that participants knew they were in a serious game allowed them to focus on solutions to challenges and not worry how the solutions would be altered or misused as sometimes happens in the real world.

Another game example of adding competition elements to a platform is the website *Challenge.gov* (2010). It is administered through the United States General Services Administration and the site *ChallengePost,* and it incorporates user contributions to cultivate solutions to challenges in the areas of science, economy, security and personal wellbeing. The site utilizes game dynamics fused with participation opportunities that focus on the development of public infrastructure (Challenge, 2010). These types of games will become more pervasive because of the broad prize authority Congress granted to all federal agencies on December 21, 2010 to encourage innovation through challenges and collaborations (Kalil & Sturm, 2010). *ChallengePost* has recently developed a problem identification companion platform to their initial program that is focused on problem solution (Kessler, 2011). This allows the users of *ChallengePost* to explore the entire spectrum of problems and solutions. The partnership of *ChallengePost* with the General Services Administration demonstrates that public institutions value the suggestions generated by serious game platforms and are incorporating them into

operational practice. Similarly, Arizona State University has developed *10,000 Solutions,* a project that solicits ideas from the ASU community on topics ranging from education, technology, community development and others as a way that members of the ASU community can work collaboratively to solve problems and provides targeted prizes for the best solutions (Arizona State University, 2011). As serious game platform opportunities become more available, the public will become increasingly aware of and comfortable with interacting on such platforms. Public organizations can continue to explore how properly designed and implemented gamification opportunities can be a multidimensional, interactive, and constructive public interface to discover innovative solutions to collective governance problems.

Task Driven

One of the general arguments against direct participation by the public in governance processes is that it would be inefficient (Roberts, 2004). A specific critique is that incorporating direct participation would not be beneficial to the quality of service due to costs in time, funds, and effort to ensure that all citizens have the opportunity to make a substantial contribution (Cleveland, 1975). Noveck (2009) proposes a potential solution where large policy problems are divided into smaller sections so the efforts of interested citizens could be targeted on the area of their particular interest. Participants do not have to be professionals to contribute, nor must they understand the entire structure of an organization; rather they must be able to provide small contributions that aggregate into larger objects. Open governance platforms expand the opportunities for citizens to contribute to the process of governance in new ways that can benefit organizations rather than overwhelm. The following platform examples demonstrate how organizations can benefit from requesting assistance in solving a specific operational problem.

Crowdsourcing platforms have been used by public organizations when the agency has not found a solution to a specific problem and would benefit from the contribution of additional minds. *Amazon Mechanical Turk* is a private collaboration platform where individuals can complete tasks for small sums of money and other's can post jobs for others to complete (Amazon Mechanical Turk, 2011). Other task opportunities are made available to participants through common leisure interests, and sometimes the skills developed in those activities become useful when emergencies occur. Such an event happened recently when a hiker and regular contributor to the *Hike Arizona* site, "gpsjoe," was lost in the Mazatzal wilderness. The website became a hub for sharing information about the search. A tangible sense of community had developed among regular users of the site as they were connected by common interest and had fostered personal relationships through regular interactions; many users personally knew "gpsjoe". His disappearance affected members of the community, and they donated their time and effort to assist in the search when permitted by search and rescue. An individual hiker may not be able to cover much ground through the dense mountain landscape, but the collective efforts of individuals who may not be search and rescue professionals but competent, knowledgeable hikers with an understanding of the terrain contributed to the thirty-eight unique search routes (Hike Arizona, 2011). This example has two important takeaways. First, individuals were willing to donate personal time and resources to a collective activity because of the network created through participation on the site, demonstrating an instance of diffuse leadership where organizational structure does not influence the ability of individuals to act as leaders (Denhardt & Denhardt, 2006). Second, the site served as a communication board that allowed search and rescue professionals to communicate with the hikers and, when permitted, facilitated

11

coordination among the people willing to search a new route and compile all individual searched routes into one map, thereby eliminating redundant search efforts.

There are other examples that do not relate to emergencies, but similarly enable participants to contribute to tasks. A government task platform opportunity arose when the FBI released encrypted notes from a 1999 murder in hopes that someone would be able to break the code (Cooney, 2011). NASA's citizen science site *Galaxy Zoo* has an emphasis on learning; it allows for individuals to classify galaxies according to their shape (Galaxy Zoo, 2011). A wide array of tasks can be made available and participants can use their personal skills and values to contribute to the completion of the task.

Platforms with game structures have been used by organizations to complete specific tasks. The opportunities allow participants to compete to solve a challenge, which allows users to participate in areas of personal interest, encourages competition and collaboration, and rewards will be distributed for good work. Participants that engage in task game platforms can have remarkable results, such as how a complex protein structure present in the development of AIDS that researchers had worked on for years was solved by *Foldit* gamers in three weeks (Khatib et al., 2011). Another task example was sponsored by the Air Force; a twenty thousand dollar reward was offered to the participant who could design a system to differentiate between gender and adults and children on videos to decrease the number of civilian fatalities in drone and bombing attacks (Wheeler, 2011). This example demonstrates that task challenges can use contributions from participants without being exposed to classified information. There are platforms that challenge participants to contribute to physical tasks. One example is the official GPS cache hunt site *Geocaching* (Geocaching, 2011). Individuals physically find caches placed by others as quickly as possible using global positioning system (GPS) devices. As discussed before, *Challenge.gov* gives citizens opportunities to participate in government challenges, and the solutions generated through solving challenges may benefit many (Challenge, 2010). Another task platform is *Cablegate: The Game* that uses rewards to encourage individuals to review at cables released by embassies and distill pertinent information (Cablegate, 2010). Both examples demonstrate how a relatively simple specific task can be processed by a group of individuals that increases efficiency and rewards workers who perform well. Other task games challenge participants to find unique solutions using the tools at hand. The Defense Advanced Research Projects Agency (DARPA) ran a game in 2009 where ten red weather balloons are positioned across the continental United States and contestants are challenged to locate them all as quickly as possible (DARPA Network Challenge, 2009). The winners of the challenge from MIT located all ten balloons under nine hours utilizing collaboration incentives and social networking tools.

Game structures present an opportunity for individuals to develop unique solutions to targeted challenges that reward the individual and benefit the group. There is an increasing interest in the contribution of games to organizational practices. Lennon (2011) discusses how some companies have instituted company war games where a group of users try to compromise a system while another group defends it. The experience shows companies where weaknesses in their programs are located and can be fixed and challenges employees to work together in unique ways to reach an objective. In addition, The University of Pennsylvania's Wharton School held in August 20011 "For the Win: The Serious Gamification Symposium" to explore how businesses can and have used games as challenges to improve their businesses (Dunham, 2011). Organizations of all

kinds are exploring how task games can lead to the discovery of new information and new methods to unearth information that can lead to changes in the way organizations operate.

Learning

The distribution of power between government and citizens has an effect on the relationship between the two entities (Arnstein, 1969). Access to comprehensive, relevant information increases the power of citizens in that they have an understanding of what is occurring in government. We have discussed how traditional E-government sites have improved government transparency through creating constant access to information via the internet. Open governance platforms can contribute to the clear presentation of information by shaping the way information is presented through a medium that facilitates a variety of delivery methods and allowing participants to interact with each other in the learning process.

The field of education is littered with such platforms to teach students information in new ways. An example of an educational platform is Wolfram Alpha that helps students understand mathematics conceptually through visual tools and computational assistance (Wolfram, 2010). The interesting aspect of this platform is that is encourages the empowerment of students through explaining math in new ways in addition to learning through solving equations, "What I really think we gain from this (program) is students getting intuition and experience in far greater quantities than they've ever got before, and experience harder problems. Being able to play with the math, interact with it, feel it" (Wolfram, 2010, 12:38). Such programs demonstrate that people are thinking about how to engage participants in new ways and are using games and game dynamics to help individuals achieve their individual goals, such as educational attainment, by keeping information entertaining and easy to process, with access to professionals who can assist users if anything is unclear. Exploratory programs are not limited to students. Former Justice, Sandra Day O'Connor, developed the *iCivics* platform as a way to teach anyone civics and promote democratic engagement (iCivics, 2011). The *Stanford Persuasive Tech Lab* conducts research to learn about how the design of websites can alter the beliefs and actions of individuals who use them (Stanford, 2010). Interactions with participants increase understanding of customer preferences and can influence how products are designed in the future. Another platform is finding new interactions between individuals and groups for collaborations and partnerships. Bender (2010) provides an example of how financial information can lead to new understanding of the relationship between politics and money through the site *Open Book*, which combines state contract documents and political donors in Illinois.

There are education platforms that have incorporated game characteristics to encourage participation by users. The Khan Academy is a nonprofit interactive website which utilizes video lectures and interactive problem sets for students to utilize in different areas of study (Khan, 2011). Khan reported that a school district began using the program by assigning the video lectures as homework and then having students work on 'homework' in the classroom. The two paradigm shifts were that students were able to move at a pace that improves their confidence and ensure they master the material. This learning format shifts the focus of teachers from lecturing to helping students as they master content through assignments. He also found that the targeted use of badges, or rewards for certain behavior, were powerful motivators to cultivate desired participation and learning outcomes.

13

Exploratory and learning platforms challenge students or participants to learn new information and reward them based on their demonstration of that knowledge. One game platform designed with a knowledge acquisition focus is the *UVA Bay Game* that teaches participants about the environmental, policy, and financial challenges of the Chesapeake Bay watershed through an agent based simulation (UVA Bay Game, 2011). The participants not only learn about the ecosystem of the bay, but also about the role of people who live around the area and rely on its natural resources. The objective of the game *Spent* is to challenge perceptions of poverty by having players act in the role of low income single parents who have to survive the month on the resources available to them (Spent, 2011). Learning and exploratory game constructs have a larger scope than just a specific subject matter. Participants have opportunities in the online environment to interact with each other as well as the program in which they are participating. Individuals can become prospective clients or partners, advisors, facilitators and moderators. The site Slashdot has created a system of distributed moderation where individuals awarded high points from their peers for past comments can become moderators who can in turn guide future discussion (Lampe & Johnston, 2005). Educators continue to develop innovative ways to impart information to people and incorporate feedback systems through rewards and prizes to encourage thorough processing of data that will be beneficial and efficient to learning outcomes.

Innovation Intermediaries
While this paper has focused on the user side of the process, we cannot forget the organizations and individuals within it that sponsor participatory platforms. Data presented without a filter could be overwhelming. Imagine, for instance, trying to learn about the complete tax code or making sense of political fundraising data. There is a difference between information being public and information being navigable and useful by the public. Information can be structured to achieve true accessibility leading to positive participatory outcomes (Johnston & Hansen, 2011). One of the primary contributions to looking at game structures is in their usability in processing information. Games structures can inform and also contribute to innovation as participants devise new structures for reporting information. A consistent opportunity for a game to be of assistance is in deliberations is public budgeting – it may be possible to find new solutions to improve the way funds are tracked and allocated within the existing parameters of budget requirements, much like the Brazilian participatory budgeting programs (Wampler, 2000). The development of games for use in public administration is insufficient in and of itself – pathways for integration in government must be developed.

Government is already under pressure to streamline and increase efficiency and, therefore, may be reluctant to use serious game platforms if perceived as a temporary trend or gimmick rather than a viable medium for direct participation (Bogost, 2011). One of the challenges for game platforms are the burden public agencies would have to design and implement their own game platforms from scratch. However, as game platforms are developing, there are intermediary businesses emerging that specialize in helping organizations with their ideas for serious games and developing procedures that focus on platform implementation. One site that has a direct focus on streamlining processes for businesses is *GEN3 Partners*. The company works to improve the innovation process. "The GEN3 Innovation Discipline [G3: ID] is a structured methodology that brings discipline and rigor to the innovation process, as opposed to brainstorming and trial and error. Implicit in this approach is the ability to access global technical expertise through our Global Knowledge Network. Finally, we work in partnership with our

clients to develop breakthrough solutions that drive speed to market and greater innovation results" (GEN3 Partners, 2011). If public organizations are interested in using games or game dynamics in their daily operations to solve problems, intermediary organizations are useful to help ensure that the structural organization contributes to attaining the innovation goal.
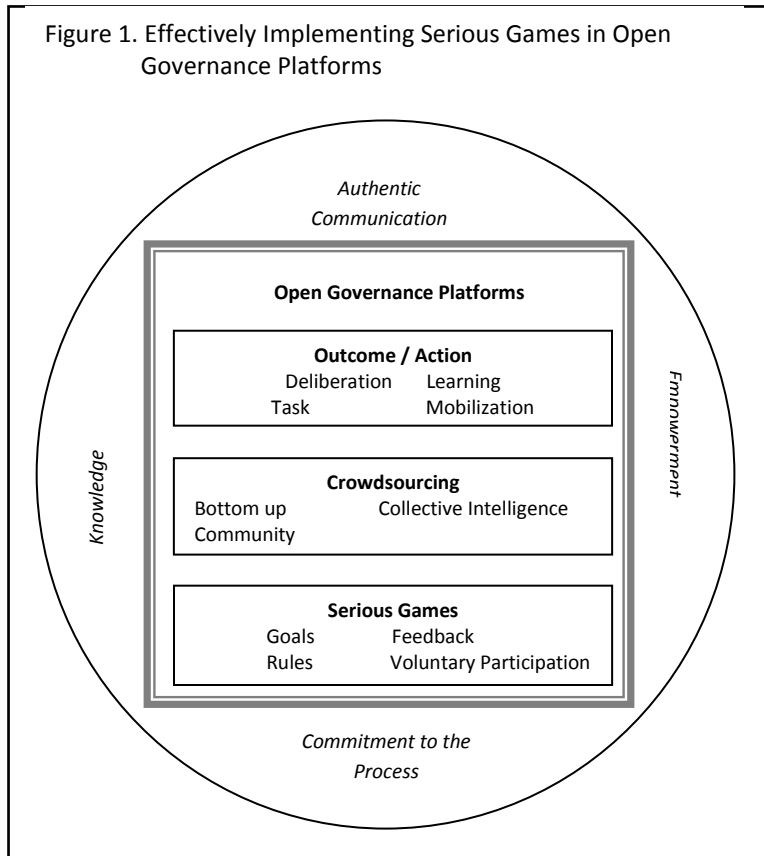
There are other intermediary organizations that assist with development of challenges a la carte where companies can have external help developing solutions. One example of this type of company is *Innocentive* that connects companies with solutions by posting challenges that individuals or groups can answer (Innocentive, 2011). One of the challenges sponsored by *Innocentive* was from a solar company who wanted to develop a light that could be used in underdeveloped communities around the world without electricity. A solution was found in two months and the engineer who developed the solution was given $20,000 (Innocentive, 2011). *Open Ideo* (2011) is another site that also posts challenges for participants to solve in a collaborative community through three steps of development. An example of a current challenge is about improving the connection of food production and consumption (Open Ideo, 2011). At the end of the developmental process a single concept is selected as the best solution and is implemented to solve the challenge. The information page on the site discusses how the organization values collaboration in creative problem solving, "We believe passionately that innovation requires collaboration and that technology can facilitate teamwork across great distances. We couldn't find a platform that accommodated all of our core needs (which includes being able to split up the innovation process into phases and to build on the ideas of others), so we created our own. Now we're sharing it" (Open Ideo, 2011).

Within the public sector, an intermediary organization that has recently emerged is *Ashoka Changemakers* which is a collaborative community working to solve social problems (Ashoka Changemakers, 2011). This site has a public sector focus rather than innovation for private industry. It is likely that as people become increasingly familiar with collaborative problem solutions that demand for platforms with a focus apart from business like *Ashoka Changemakers* will continue to grow. Adopting serious games into daily operations will have a lower perceived risk threshold if there are intermediary organizations like the ones discussed above whose purpose is to help guide the process and develop and spread best practices.

A Framework of Implementation of Games in Government in 10,000 Solutions
With the current trends of limiting government scope and diminishing resources, public service will continue to be challenged with an expectation of higher production with fewer resources to accomplish tasks (Cameron, 2010). Open governance platforms that include game characteristics can be beneficial in accomplishing public challenges by making participation on platforms entertaining, challenging and meaningful. We present the following framework in Figure 1 for the serious game participatory platform process. The framework is derived from participation literature and successful operating platforms.

15

Figure 1. Effectively Implementing Serious Games in Open Governance Platforms

Open Governance Platforms

Outcome / Action
Deliberation   Learning
Task   Mobilization

Crowdsourcing
Bottom up   Collective Intelligence
Community

Serious Games
Goals   Feedback
Rules   Voluntary Participation

Authentic Communication

Empowerment

Knowledge

Commitment to the Process

We will walk through the framework using the *10,000 Solutions* project presented in the deliberative platforms discussion as an example to illustrate the framework figure. As noted earlier, *10,000 Solutions* is a serious game platform created by Arizona State University and is currently being studied by a research group at the university. While our discussion has focused on the functions of open governance platforms, the tool is a medium that can assist in broadening and deepening governance processes. For instance, *10,000 Solutions* would not be an effective platform if the only objective was for the public to submit an arbitrary number of solutions. People would question the purpose of coming up with ideas if nothing was going to happen to them and would likely not be motivated to engage with the platform. The actual purpose of *10,000 Solutions* is to connect the public, particularly those in the ASU community, with others thinking about how to solve similar community challenges. The long term objective of the platform is to form new bonds within the platform community and create a place where the development of ideas can benefit all involved. Users, the university and the community can benefit from the participation on the site, making the activity one of merit if properly executed. The ellipse in the figure represents the relationship between the public and public organizations, as well as design intermediaries that build and maintain the platforms.

Within the ellipse are components that are essential for ensuring that the open governance platform strengthens the relationship between the public and the sponsoring organization. Authentic communication sets a foundation for participation that leads to mutually beneficial outcomes. This includes clear explanation of the intended purpose of the participatory activity and how the product of participation will be used. In the case of *10,000 Solutions*, the intent of

16

the site is to encourage proactive problem solvers and through participation with the platform help contribute to a collective solution repository. The platform offers an incentive to participate by offering a reward for the strongest solutions submitted. Communication with peers is encouraged in the site with structural tools such as the ability to comment, support, or builds on a solution. By using the tools users can prioritize areas of interest and identify solutions that are deemed to be the most useful. The component of empowerment is vital when considering motivation for the public to participate in an open governance platform. The literature discussed earlier demonstrated that if individuals are considering participating, that they want their contribution to matter and that their voice can be heard. Users of *10,000 Solutions* are empowered within the platform to express their ideas on things that matter to them. The free form structure of the site does not limit the scale of ideas and does not pose problems to be solved, so people can contribute a variety of solutions to the community. The development of knowledge through interaction keeps participatory activities meaningful to both parties by enabling each to contribute. For instance, the users of *10,000 Solutions* are generating information about what community priorities, not only by identifying thing that can be improved but also by proposing solutions to them. Arizona State University can benefit from the solutions proposed as new ideas may be identified that can be used to improve service. At the same time, users of the platform can benefit from the institutional knowledge and resources that the university has to develop their idea from a proposal to reality. Both parties contribute expertise towards the improvement of the academic and local community. The final component is commitment to the participatory process. While the generation of solutions may be the goal of 10,000 Solutions, the larger intent is to create a collaborative community of problem solvers that spans academic discipline and community interest.

To successfully implement open governance platforms, there must be structural decisions made on how the platform will be designed and used. First, the sponsoring organization must know what the intended outcome or action is expected from the participation in the platform. The purposes of platform participation are deliberation, learning, task and mobilization. In the case of *10,000 Solutions* the intent is to create an environment where users can interact and generate solutions to problems; the development of a problem solving community supersedes the number of solutions generated in the first year of activity. Sponsoring organizations can benefit from the expertise of design intermediaries to ensure the platform is designed to create the desired outcome. *10,000 Solutions* has an open structure without any problems posed because the objective is for the user community to identify their own priorities without organizational influence. The contribution of crowdsourcing to any open governance platform is how it impacts the experience of users. The participants of *10,000 Solutions* have the opportunity to voice their solution proposals in a bottom up process. A community is created through the development of ideas to solve problems and while great diversity of interest is supported in the platform, all activity is united through the common purpose of solving problems. The participants are mobilized to action first by their contribution and interaction with peers on the platform, but may also be mobilized in other participatory activities in the real world. Finally, serious games can contribute to the quality of the governance platforms through its understanding of goals, rules, feedback systems and voluntary participation. *10,000 Solutions* utilizes the structural contribution of games by identifying the target of 10,000 solutions to be contributed to the pool as well as developing a problem solving community, rules for how to participate and how proposals can win some of the reward money, providing feedback to users by the support,

17

comment and build functions for solution proposals, and being intriguing enough that users engage in the platform without having to be asked.

The primary contribution of the framework is to challenge governance organizations to think about the relationship they are developing with the public when using open governance platforms including game characteristics. Each entity involved is important and the design of the platform can lead to markedly different outcomes, all of which can serve a beneficial role in improving the community. Thinking through the entire process can assist public organizations to methodically develop their platform to ensure that it results in a mutually beneficial experience for the public and the organization with results that can be used to improve public service.

Barriers to Using Serious Games in Government
To inject a grain of salt in regard to the potential of utilizing coordinated platforms with game characteristics, it is important to note that there are certainly times when the application of games are not appropriate. A good game is difficult to design, and for every successful game like *World of Warcraft* there are many that fail. Adding game dynamics to address a governance challenge is not a shortcut to success. Bogost (2011) argues that games will be misused by organizations that incorporate them as an additional component to business practices without understanding what makes games alluring, meaningful, and rewarding.

Certain participatory platform designs can lead to activities that restrict growth and innovation due to political bias in its design. One such example is the program proposed by House majority leader Eric Cantor, *YouCut Citizen Review*; this program allows citizens to look at grants funded by the National Science Foundation and note grants that they consider to be wasteful spending (Aldhous, 2010). The primary focus of *YouCut* is on cutting programs, and has a different objective from the United Kingdom budgeting program, which is an effort to increase transparency of government spending. This type of participation is not value neutral, as the emphasis is solely focused on restriction rather than new kinds of expansion. The framework and underlying assumption of the review program assumes that the funds allocated to some of the approved studies will be wasted. There is no opportunity for citizens to show support for research proposals, as the framework is solely focused on perceptions of waste. It could be that citizens will decide a project is unnecessary if they do not understand the research. The *YouCut* program puts both researchers and the National Science Foundation in defensive positions since the current design of the program provides only ammunition to attack the agency for how it chooses to spend its allocated funds and is a form of participatory 'exclusion. Participants are empowered in *YouCut* by being given the opportunity to voice what they determine to be wasteful spending, but the range of communication is restricted leading to a skewed conversation about the public's interest in government funded research. There are benefits to examine ways to streamline government, but the long-term potential of games lies in the ability to create rather than destroy.

Conclusion
Game platforms should not be considered isolated opportunities for individuals to participate in the process of government, but rather a complementary medium to develop long lasting and mutually beneficial relationship between the public and government. The lesson learned from the participation literature is to keep the objective of maintaining an authentic and interactive

relationship by making participatory activities meaningful. The contribution of serious games to E-government is to make it easier for that authentic relationship to be realized in the online environment through entertaining and challenging designs on top of the intellectual community building of crowdsourcing. To realize the potential and avoid the pitfall of poorly designed games, more systematic research is needed to determine appropriate use, design, integration, and evaluation. There will be some game structures that only work well in a specific area, and others may be inappropriate or harmful to practice. It will take time and experimentation to learn what types of participatory games are the best fits.

The use of game dynamics in addition to crowdsourcing platforms can be used to provide opportunities for participation not found in any other medium. Participatory opportunities that encourage continued use through feedback systems are well suited to enhancing the experience of public participation. If people know that their contributions matter, they are much more likely to invest in the quality of the contributions (Lampe & Johnston, 2005). Potential problem solvers from all walks of life would be empowered to have a practical influence on governance in areas of public life that are most important to them, leading to a responsive and truly participatory government; the democratic surplus can be accessed to the benefit of the country. People may participate more than expected due to a feeling of community, "Adding the social motivations of membership and generosity to the personal motivations of autonomy and competence can dramatically increase activities" (Shirky, 2010, 172). Gamification may be the approach that attracts individuals to new participatory access points, but it is the combination of games and community that will sustain the practice.

There is a growing democratic surplus in citizens (Johnston & Hansen, 2011; O'Reilly, 2010; Preibatsch, 2010; Wachhaus, 2011). A democratic surplus is untapped citizen effort, goodwill, expertise, innovation, and leadership that can be collaboratively pooled to improve society through public participation in government. This surplus has not been included in calculations of available resources by public administrators. The fact that the General Services Administration is running and using the *Challenge.gov* site is a type of formal recognition of the potential link that the game medium can access this surplus. Changing the type of interaction between institutions and individuals might change attitudes toward the legitimacy of the institution. Rather than focusing dialog on who is right or wrong, political conversations can shift to how to create the most innovative idea to solve the problem at hand. The public can become partners of the government; a human resource created through millions of individuals with unique perspectives and life experiences. People have the passion, the education and resources to contribute to the development of the country. Games can engage citizens, giving them the opportunity and motivation to constructively improve the government under which they live as much as they do in the virtual worlds where they play.

19

References

Aldhous, P. (2010). US Public Asked to Play Judge and Jury for Science Funding. *Short Sharp Science*. Retrieved from http://www.newscientist.com/blogs/shortsharpscience/2010/12/us-public-asked-to-play-judge.html.

Aldrich, C. (2009). *The Complete Guide to Simulations & Serious Games: How the Most Valuable Content Will Be Created in the Age Beyond Gutenberg to Google*. San Francisco: John Wiley & Sons Inc.

Amazon Mechanical Turk (2011). Retrieved from https://www.mturk.com/mturk/welcome.

Andersson, E., Fennell, E., & Shahrokh, T. (2011). Making the Case For Public Engagement: How to Demonstrate the Value of Consumer Input. *Involve*. Retrieved from http://www.involve.org.uk/wp-content/uploads/2011/07/Making-the-Case-for-Public-Engagement.pdf.

Arizona State University (2011). *ASU Challenges*. Retrieved from http://www.asuchallenges.com/.

Arnstein, S. (1969). A Ladder of Citizen Participation. *Journal of the American Institute of Planners*, 35(4) 216-224.

Ashoka Changemakers (2011). Retrieved from http://www.changemakers.com/.

Bender, E. (2010). Case Study: Follow the Money.org. In Lathrop, D., & Ruma, L. (2010) *Open Government: Collaboration, Transparency and Participation in Practice*. Sebastopol, CA: O'Reilly Media, Inc.

Bertot, J.C. & Jaeger, P.T. (2008). The E-Government paradox: Better customer service doesn't necessarily cost less. *Government Information Quarterly*, 25, 149-154.

Bogost, I. (2011). Gamification is Bullshit. *Bogost.com*. Retrieved from http://www.bogost.com/blog/gamification_is_bullshit.shtml

Brady, H.E., Verba, S., Schlozman, L. (1995). A Resource Model of Political Participation. *The American Political Science Review*, 89(2), 271-294.

Bryer, T. (2011). Bureaucratization and Active Citizenship: Approaches to Administrative Reform. *National Association of Schools of Public Affairs and Administration.* Retrieved from http://www.naspaa.org/initiatives/paa/pdf/thomas_bryer.pdf.

Cablegate: The Game (2010). Retrieved from http://cablegategame.com/.

Cameron, D. (2010). The Next Age of Government. *Technology, Environment, Design* (TED). [Web Lecture]. Retrieved from http://www.ted.com/talks/lang/eng/david_cameron.html.

Carter, L. & Belanger, F. (2005). The Utilization of e-Government Services: Citizen Trust, Innovation and Acceptance Factors. Information Systems Journal, 15(1): 5-25.

Challenge.gov (2010). Retrieved from http://challenge.gov/.

Cleveland, H. (1975). How do You Get Everybody in on the Act and Still Get Some Action? *Public Management*, 57, 3-6.

Cooney, M. (2011). FBI Wants Public Help Solving Encrypted Notes From Murder Mystery. *Network World*. Retrieved from http://www.networkworld.com/community/blog/fbi-wants-public-help-solving-encrypted-notes.

DARPA Network Challenge (2009). Retrieved from https://networkchallenge.darpa.mil/default.aspx.

deLeon, P. (1992). The Democratization of the Policy Sciences. *Public Administration Review*, 52(2), 125-129.

20

Denhardt, R.B., & Denhardt, J.V. (2000). New Public Service: Serving Rather Than Steering. *Public Administration Review*, 60(6), 549-559.

Denhardt, R.B. & Denhardt, J.V. (2006). *The Art of Leadership: the Art of Leading in Business, Government and Society*. New York: M.E. Sharpe, Inc.

Dignan, A. (2011). *Game Frame: Using Games as a Strategy for Success*. New York: Free Press.

Doan, A., Ramakrishnan, R., & Halevy, A. (2011). Crowdsourcing Systems on the World-Wide Web. *Communications of the ACM*, 54(4), 86-96.

Dunham, J. (2011). *For the Win The Serious Gamification Symposium*. Retrieved from http://gamifyforthewin.com/.

Evans, D., & Yen, D.C. (2005). E-government: An Analysis for Implementation: Framework for Understanding Cultural and Social Impact. *Government Information Quarterly*, 22, 354-373.

Fischer, F. (1993). Citizen Participation and the Democratization of Policy Expertise: From Theoretical Inquiry to Practical Cases. *Policy Sciences*, 26(3), 165-187.

Fix My Street (2011). Retrieved from http://www.fixmystreet.com/.

Foremski, T. (2010). The Smart Money Values Farmville $1Bm Over Twitter…. ZDNet. Retrieved from http://www.zdnet.com/blog/foremski/the-smart-money-values-farmville-   1bn-over-twitter/1227.

Frum, L. (2011). Sid Meier: Games are taking over the world. *CNN*. Retrieved from http://www.cnn.com/2011/TECH/gaming.gadgets/05/10/sid.meier.civilization/index.html

Galaxy Zoo (2011). Retrieved from http://www.galaxyzoo.org/.

Garris, R., Ahlers, R., & Driskell, J.E. (2002). Games, Motivation and Learning: A Research and Practice Model. *Simulation and Gaming*, 33, 441-467.

Gee, J.P. (2003). What Video Games Have to Teach Us About Learning and Literacy. *ACM Computers in Entertainment*, 1(1), 1-4.

GEN3 Partners (2011). Retrieved from http://www.gen3partners.com/.

Geocaching (2011). Retrieved from http://www.geocaching.com/about/default.aspx.

Gladwell, M. (2008). *Outliers: The Story of Success*. New York: Little, Brown and Company.

Government Shines Light on Spending Over £25,000. (2010). *British Broadcasting Company*. Retrieved from http://www.bbc.co.uk/news/uk-politics-11792894.

Heeks, R. (2003). Most e-Government-for-Development Projects Fail: How Can Risks be Reduced? *Institute for Development Policy and Management*, iGovernment Working Paper Series, 14. Retrieved from http://unpan1.un.org/intradoc/groups/public/documents/NISPAcee/UNPAN015488.pdf.

Hike Arizona (2010). Retrieved from http://hikearizona.com/map.php?QX=739.

Huxham, C., Vangen, S. (2000). Leadership in the Shaping and Implementation of Collaboration Agendas: How Things Happen in a (Not Quite) Joined-up World. *The Academy of Management Journal*, 43(6), 1159-1175.

IdeaScale (2011). Retrieved from http://ideascale.com/.

iCivics (2011). Retrieved from http://www.icivics.org/.

Innes, J.E., & Booher, D.E. (2004). Reframing Public Participation: Strategies for the 21st Century. *Planning Theory and Practice* 5(4) 419-436.

Innocentive (2011). Retrieved from http://www.innocentive.com/.

Irvin, R.A., Stansbury, J. (2004). Citizen Participation in Decision Making: Is It Worth the

Effort? *Public Administration Review*, 64(1), 55-65.

Johnston, E., & Hansen, D. (2011). Design Lessons for Smart Governance Infrastructures. In D. Ink, Balutis, A. & Buss, T. (Ed.), *American Governance 3.0: Rebooting the Public Square?*: National Academy of Public Administration.

Kalil, T., & Sturm, R. (2010). Congress Grants Broad Prize Authority to All Federal Agencies. Retrieved from: http://www.whitehouse.gov/blog/2010/12/21/congress-grants-broad-prize-authority-all-federal-agencies (2011 January).

Kessler, S. (2011). Crowdsourced Contest Platform Now Looking to ID Problems, Not Just Solve Them. *Mashable*. Retrieved from http://mashable.com/2011/08/09/challengepost/.

Kettl, D.F. (2009). *The Next Government of the United States: Why Our Institutions Fail Us and How to Fix Them*. New York: W.W. Norton & Company Inc.

Khan, S. (2011). Let's Use Video to Reinvent Education. *Technology, Environment, Design* (TED). [Web Lecture]. Retrieved from http://blog.ted.com/2011/03/09/lets-use-video-to-reinvent-education-salman-khan-on-ted-com/

Khatib, F., DiMaio, F., Foldit Contenders Group, Foldit Void Crushers Group, Cooper, S., Kazmierczyk, M., Gilski, M., Krzywda, S., Zabranska, H., Pichova, I., Thompson, J., Popovic, Z., Jaskolski, M., & Baker, D. (2011). Crystal Structure of a Monomeric Retroviral Proteaase Solved by Protein Folding Game Players. *Nature Structural and Molecular Biology*, 18(9), 1-3. doi 10.1038/nsmb.2119.

King, C.S., Feltey, K.M., O'Neill, B. (1998). The Question of Participation in Public Administration. *Public Administration Review*, 58(4), 317-326.

Kings, C.S., & Stivers, C. (1998). *Government Is Us: Public Administration in an Anti-Government Era*. Sage Publications. Thousand Oaks, CA.

Kluger, A., DeNisi, A. (1996). The Effects of Feedback Interventions on Performance: A Historical Review, a Meta-Analysis, and a Preliminary Feedback Intervention Theory. *American Psychological Association Psychological Bulletin,* 119(2), 254-284.

Lampe, C., LaRose, R., Steinfield, C., & DeMaagd, K. (2011). Inherent Barriers to the Use of Social Media for Public Policy Informatics. *The Innovation Journal*, 16(1) Article 6, 1-17.

Lampe, C., & Johnston, E. (2005) Follow the (Slash) dot: Effects of feedback on new users in a virtual public sphere. *Proceedings of the 2005 international ACM SIGGROUP conference on supporting group work*. 11 – 20.

Lave, J., Wenger, E. (1991). *Situated Learning: Legitimate Peripheral Participation*, Cambridge: Cambridge University Press.

Layne, K. & Lee, J. (2001). Developing Fully Functional E-Government: A Four Stage Model. *Government Information Quarterly*, 18(2) 122-136.

Lennon, M. (2011). Organizations Struggle with Data and Application Security Budgets & Strategies. *Security Week*. Retrieved from http://www.securityweek.com/organizations-struggle-data-and-application-security-budgets-strategies.

Locke, E., Latham, G. (2002). Building a Practically Useful Theory of Goal Setting and Task Motivation: A 35-Year Odyssey. *American Psychologist*, 57(9), 705-717.

Lostpedia (2011). Retrieved from http://lostpedia.wikia.com/wiki/Main_Page.

Lynn, L.E. (1999) The New Public Management. *Government Finance Review*, 15(2), 15-30.

MacKie-Mason, J. (2011). "Gamification": Making Intrinsic Motivators Better? *ICD Stuff*.

Retrieved from http://mblog.lib.umich.edu/~jmm/.

Merrifield, J. (2002). *Learning Citizenship*. Institute of Development Studies, IDS Working Paper 158. Retrieved from http://www.ids.ac.uk/files/Wp158.pdf.

McGonigal, J. (2011). *Reality is Broken: Why Games Make Us Better and How They Can Change the World*. New York: The Penguin Press.

McGonigal, J. (2010, February). Gaming Can Make a Better World. *Technology, Environment, Design* (TED). [Web Lecture]. Retrieved from http://www.ted.com/index.php/talks/lang/eng/jane_mcgonigal_gaming_can_make_a_better_world.html (2010 March).

Missouri Accountability Portal (2007). Retrieved from http://mapyourtaxes.mo.gov/MAP/Portal/Default.aspx

Moon, J. (2002). The Evolution of E-Government Among Municipalities: Rhetoric or Reality? *Public Administration Review*, 62(4) 424-433.

NFL Attendance-2010 (2010). *ESPN*. Retrieved from http://espn.go.com/nfl/attendance.

Noveck, B.S. (2009). The Single Point of Failure. In Lathrop, D., & Ruma, L. (2010) *Open Government: Collaboration, Transparency and Participation in Practice*. Sebastopol, CA: O'Reilly Media, Inc.

NYC BigAppsIdeas (2011). Retrieved from http://ideas.nycbigapps.com/.

Open Ideo (2011). Retrieved from http://openideo.com/.

Opinion Space (2011). Retrieved from http://opinion.berkeley.edu/landing/.

O'Reilly, T. (2009). Gov 2.0: The Promise of Innovation. Forbes. Retrieved from http://www.forbes.com/2009/08/10/government-internet-software-technology-breakthroughs-oreilly.html.

O'Reilly, T. (2010). Governance as a Platform. In Lathrop, D., & Ruma, L. (2010) *Open Government: Collaboration, Transparency and Participation in Practice*. Sebastopol, CA: O'Reilly Media, Inc.

Page, N., % Czuba, C. (1999). Empowerment: What Is It? *Journal of Extension*, 37 (5).

Parent, M., Vandebeek, C.A.., & Gemino, A. (2004). Building Citizen Trust Through e-Government. *Government Information Quarterly*, 22(4): 1-9.

Priebatsch, S. (2010, July). The Game Layer on Top of the World. *Technology, Environment, Design* (TED) [Web Lecture]. Retrieved from http://www.ted.com/index.php/talks/lang/eng/seth_priebatsch_the_game_layer_on_top_of_the_world.html. (2010, August).

Reich, B. (2010). Citizens' View of Open Government. In Lathrop, D., & Ruma, L. (2010) *Open Government: Collaboration, Transparency and Participation in Practice*. Sebastopol, CA: O'Reilly Media, Inc.

Roberts, N. (2004). Public Deliberation in an Age of Direct Citizen Participation. *The American Review of Public Administration* 34(4) 315-353.

Rosenbloom, D. (1983) Public Administrative Theory and the Separation of Powers. In Shafritz, J. & Hyde, A. (6th Edition), *Classics of Public Administration,* 434-444. Boston, MA: Thomson Wadsworth.

Schact, S. (2009). Democracy, Under Everything. In Lathrop, D., & Ruma, L. (2010) *Open Government: Collaboration, Transparency and Participation in Practice*. Sebastopol, CA: O'Reilly Media, Inc.

Schooler, L. (2010). US Gaming Revenues Will Increase to Over $68 Billion in 2014 with Recovery Expected in Late 2011, According to PwC. *PricewaterhouseCoopers*. Retrieved from http://www.pwc.com/us/en/press-releases/2010/US-gaming-revenues.jhtml.

ScienceforCitizens.net. (2011). Retrieved from http://scienceforcitizens.net/.

Shirky, C. (2010). *Cognitive Surplus: Creativity and Generosity in a Connected Age*. New York, NY: The Penguin Press.

Spent (2011). Retrieved from http://www.playspent.org/.

Stanford Persuasive Tech Lab (2010). Retrieved from http://captology.stanford.edu/about.

Thomas, J.C. (2010). Citizen, Customer, Partner: Thinking about Local Governance with and for the Public. In Svara, J. and Denhardt J. (2010) *Connected Communities: Local Governments as a Partner in Citizen Engagement and Community Building*. Alliance for Innovation.

Uservoice (2011). Retrieved from http://uservoice.com/.

The UVA Bay Game (2011). Retrieved from http://www.virginia.edu/baygame/.

Vigoda, E. (2002). From Responsiveness to Collaboration: Governance, Citizens, and the Next Generation of Public Administration. *Public Administration Review*, 62(5), 527-540.

Wachhaus, A. (2011). Platform Governance as a Framework to Support Informatics. Special Issue on Policy Informatics of *The Innovation Journal.* Vol. 16 (1).

Wampler, B. (2000). *A Guide to Participatory Budgeting*. Retrieved from http://www.partizipation.at/fileadmin/media_data/Downloads/themen/A_guide_to_PB.pdf.

Weber, M. "Bureaucracy". In Jay M Shafritz and Albert C. Hyde (2007) *Classics of Public Administration*. Sixth Edition. Thomson Wadsworth, Boston, MA.

Welch, E.W., Hinnant, C.C., & Moon, M.J. (2005). Linking Citizen Satisfaction with E-Government and Trust in Government. *Journal of Public Administration Research and Theory*, 15(3) 371-391.

West, D.M. (2004). E-Government and the Transformation of Service Delivery and Citizen Attitudes. *Public Administration Review*, 64(1) 15-27.

What is World of Warcraft (2011). *World of Warcraft*. Retrieved from http://us.battle.net/wow/en/game/guide/.

Wheeler, R. (2011). If You Can Tell Boys From Girls, the Air Force May Give You 20 Grand. *Wired*. Retrieved from http://www.wired.com/dangerroom/2011/04/boy-from-girl/.

Wikipedia (2011). Retrieved from http://en.wikipedia.org/wiki/Wikipedia:About.

Wilson, W. (1887). The Study of Administration. *Political Science Quarterly*, 2(2) 197-222.

Wolfram, C. (2010). Teaching Kids Real Math with Computers. *Technology, Environment, Design* (TED). [Web Lecture]. Retrieved from http://www.ted.com/talks/lang/eng/conrad_wolfram_teaching_kids_real_math_with_compute   rs.html.

Zimbardo, P. (2010, May). The Secret Powers of Time. *RSA Animate*. [Web Video]. Retrieved from http://www.youtube.com/watch?v=A3oIiH7BLmg&feature=player_embedded (2011, January).

24