Simulation Gaming as a Social Development Instrument: Dealing with Complex Problems

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ABSTRACT

Improving public service delivery is a very complex domain and the complexity is difficult to grasp by stakeholders having various degree of knowledge and involvement. An emergent and promising method for dealing with complex problems is simulation gaming, which can be used to capitalize the intrinsic experiences and knowledge of people and mobilize their creativity to come up with new solutions. A simulation game refers to a situation in which human participants play a role and follow rules of play to simulate complex situations. We developed a simulation game for the field of public-private service delivery. The purpose of the game is to facilitate public organizations to get to the core of problems in service delivery and to stimulate the collaborative development of innovative solutions for public service delivery. Playing the game at a municipality shows that the game is suitable for creating awareness and for the identification and development of alternative solutions. The game can be used to substitute the "authoritative-know-all" approach by a "wisdom of the crowds" approach, incorporating the social collaboration that is a key concept in Web 2.0 thinking.

KEYWORDS

Public services, e-government, public-private cooperation, simulation, gaming, co-creation, collaboration

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1. INTRODUCTION

Improving public services for citizens and business is one of the spearheads of many governments. Among other developments, the online presence of many government organizations provides a new service delivery channel that clients can use to contact government (other channels include the telephone and service desk) [33]. Despite the advances of Information and Communication Technologies (ICT) in (digital) government, traditional service delivery channels will often remain available to guarantee accessibility for all. As a result, service requests can be made through various service delivery channels. Integrated service delivery may include other departments and organizations. Also, this often includes other service delivery channels to communicate with – or feedback a result to – citizens or businesses. A service delivery process may be initiated through a channel at one organization and be completed via another channel at another organization, for example a request using the internet and a consequent call for status information via the telephone. Integrated service delivery often requires multiple organizations and departments each operating their own service delivery channels. The result is a complex structure of channels, departments, organizations and processes. To ensure availability of information and services through all channels, coordination and multichannel management is required [8].

Figure 1: multiple organizations and multiple channels [15]

Within this complex structure many dependencies exist, for example between channels, departments, systems and organizations, as illustrated in figure 1. This is even more complex in cases of service channels at multiple levels, for example when a national online portal is present [17]. Managing these dependencies is called coordination [24]. In service channel structures, the activities and processes of various channels must be coordinated. Given the many cross-organizational aspects that exist in public service delivery, this often includes the coordination across departmental and organizational boundaries [32]. Operating channels is often the

responsibility of the front office, while synchronization of information is a typical back office task. The coordination problem is complicated further by other organizations involved such as public organizations that need to share information, or private organizations that play a part in the service delivery chain. The variety of systems, processes, goals and culture of the various actors involved increases the quantity and complexity of the dependencies. To accommodate the multichannel delivery of public services, governance, organizational, process and information aspects need to be taken into account [15].

Multichannel service delivery is often a joint effort of an entire organization or network. Therefore, developing and implementing changes requires change management. Even in an hierarchical organization, treating the actors as subordinates fails to respect the complex dependencies that exist in change processes. Since it is a joint effort, an hierarchical approach – which treats other actors as controllable objects – leads to serious problems in the implementation [5]. Still, the development of innovations in service delivery is often done in an authoritative top-down fashion. Other stakeholders – at various levels and in various roles – may not be very receptive to these top-down solutions. The identification of current service delivery problems and the development of innovative solutions are complex tasks that require the involvement of the various stakeholders involved in service delivery. This requires that there exist strong communication, coordination, and cooperation between various personnel [22]. The importance of communication and involvement in achieving success has been well documented in technology adoption literature [3].

To stimulate participation and involvement of various actors in the identification of problems and the design of innovative integrated-service delivery solutions, a simulation game can be a useful instrument [11, 25]. Yet most simulations are done by computers, whereas games often refer to policy choices, made by people. There are hardly any simulation games for the field of integrated service delivery and therefore this research is aimed at investigating the potential of simulation gaming as a social development instrument by developing and playing such a simulation game. One of the advantages of a simulation game is that is can be used to reflect real-world

systems better [34]. In such a game (we will use the terms game and simulation game interchangeably) the real-world is simulated and participants are allocated roles and play a game under certain rules and in a specific situation.

In the design of the game, we borrow the core principles from the area of Web 2.0 to substitute the top-down, authoritative-know-all development and innovation of public service delivery by an approach that builds on the knowledge and expertise of the professionals that deal with service delivery in their every day's work. While Web 2.0 is a development in itself, its principles, tools and methods can be used in the development of service delivery innovations, for example to facilitate participation or to strengthen collaboration. Key in Web 2.0 thought is that the 'authoritative-know-all' approach is substituted by a 'wisdom of the crowds' approach [23]. Though often considered a technological development, we argue that the values underlying Web 2.0 can play a role outside the 'web' scope as well, by applying its principles to the very process of identifying service delivery issues and developing solutions. We propose a simulation game to facilitate the 'crowd' within organizations to collaboratively work on problem identification and solution development. Although simulation games are not found in the list of typical Web 2.0 tools – as this is not a technology –, it can be used to employ the core characteristics of Web 2.0 to include practitioners in the development process and let them generate new solutions. The premise of this approach is that it may lead to a better and shared understanding of a problem, a more realistic solution and commitment to the change process needed to realize that solution.

This paper is structured as follows. We will describe the background and use of simulation games as a tool that incorporates key elements of Web 2.0 thinking. Next, we present our game design developed for multichannel service delivery by governments. Based on that design we conducted a session at a Dutch municipality to test the usefulness of the game as a social collaboration instrument. We found that it is a useful instrument to create awareness among government officials about possible ways to progress multichannel public service delivery.

Finally, we will draw conclusions on the design of the game and its future use in research on complex systems, such as multi-organizational, multichannel service delivery.

2. SIMULATION GAMES AND USER-GENERATED SOLUTIONS

As multichannel management for government is a complex problem area, many actors – with equally many perspectives on the problem – are involved in the process, from problem identification to the development and acceptance of a solution. This makes it very difficult to come to a shared analysis of the problem and to a shared mindset on the efforts that are required to improve public service delivery. This cannot be developed top-down, but requires the involvement of many actors, including decision-makers, managerial, administrative, and service staff. Implementing solutions poses a change process that requires strong communication, coordination, and cooperation between various departments and layers of an organization [3, 22]. For education purposes, gaming simulation has proven to be able to provide an interactive environment to facilitate problem-oriented learning, and to thereby support change processes [19].

2.1 Tapping into practitioners' knowledge

In the social arena, the emergence of Web 2.0 makes individuals active contributors in the creation and organization of content. Web 2.0 is a set of tools and technologies – like blogs, wikis and social sites – developed around the concept of user generated content to harness collective intelligence [28]. The underlying idea of collective intelligence is that a group of people is better able to solve problems than any of its members by themselves [12]. Although Web 2.0 is generally described by its technological development, the literature also stresses that it is not just a set of technologies that support social interactions, but that it is also a social phenomenon [4, 30]. Hoegg et al. [13] call Web 2.0 a philosophy because people are willing to share, and not a specific technology. They state that the objective of Web 2.0 is to "mutually maximize the collective intelligence of the participants" [13].

Public service delivery is often not developed with a Web 2.0 philosophy in mind. Often experts or consultants are used to redesign processes, websites and other systems, in which the tacit knowledge of the people involved in the service delivery processes is neglected. However, given the complexity of the matter, its development might greatly benefit from applying the core concepts of Web 2.0. We therefore sought to develop an instrument that facilitates collaboration. In a simulation game, user generated solutions and alternatives can be identified and developed by individuals (such as an agency's staff) that act as active players. By using a game, the collective intelligence of the people in an organization can be used, leading not only to better solutions, but also to a better understanding of those solutions within the organization, and possibly to more commitment to the outcomes. Even though a simulation game is not a Web 2.0 technology, it can be used to enable a shift from traditional change management towards a collaborative one, thus becoming a non-technical exponent of the key principles underlying Web 2.0.

2.2 Simulation games

There are various forms of simulations and games. The notion that is common in all those concepts is that "human participants play a role in an artificial setting that models (an aspect of) reality" [26]. Game participants are allocated certain roles and play this role during the game, which is guided by rules and interventions.

Simulation can be defined as "a conscious endeavour to reproduce the central characteristics of a system in order to understand, experiment with and/or predict the behaviour of that system" [6, 26]. In the complex situation of multichannel service delivery by a variety of (public) organisations, the system includes information systems, processes, and various organizations with their own goals, procedures and culture. To capture such a system in a game setting, the complexity needs to be reduced without omitting essential details. Therefore, a model is required to support the human play in a simulation game [7]. In this light, a definition of gaming simulation for research is given by Meijer and Hofstede (2003): "*Simulation can be defined as studying the effects of human behaviour or decisions on some key variables in a model that represents a real-world system. A*

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game can be defined as a clearly delineated activity with its own roles, rules and incentives, carried out for its own sake. A gaming simulation is a simulation of a real-world system in the form of a game. This implies that the roles, rules and incentives of the game mimic some real-world phenomenon" [27]. For our purposes, a simulation game includes the key elements of a certain realistic situation in order to facilitate user interaction and collaboration to identify and experience problems, come up with improvements, and experiment with those improvements to explore the effectiveness of potential measures.

Simulation game is a type of method that can be employed in – for example – Living Labs to accomplish the user-experience [31]. Whilst in – for example – brainstorming users talk about a problem, in a simulation game they experience the problems in a quasi-realistic setting. In a similar vein, a game can be viewed as a kind of workshop, in which participants actively experience the problems and – in turn – can discuss the results. The agenda of a simulation game typically contains brainstorm elements (i.e. to collaboratively think about improvements) and workshop elements, such as discussions. In short, it should be viewed as a collection of instruments used to tackle a problem in which the game plays a key role. The question is not whether simulation gaming is demonstrable better (in research this would be similar to a discussion on whether an interview is better than a literature or survey, or in education that a lecture is better than case-based projects). The choice for a certain mix of instruments is often dependent on the goals to be achieved and the problems that need to be tackled. The added value comes from doing things in various ways in which a game can be used as a part in a mix of instruments. We propose that a simulation game uses Web 2.0 thinking to tap into the wisdom of practitioners by involving them in the identification and solving of problems.

2.3 Related work and positioning

There are various forms of gaming, from board games to computer games. For serious purposes, computer games come in the form of serious games, which aim to learn something to the player, e.g. instructional computer games [10]. Gaming refers to the situation in which human players play a role in an artificial situation.

We use the term simulation to reflect that the artificial situation mimics a real world phenomenon. This draws on the well established field of simulation, which is one of the most widely used methods in operations research and management science [21]. Simulation allows various stakeholders to understand the essence of a system, identify possible improvements, and to evaluate the effect of proposed changes on key performance indicators [21, 29]. This makes it possible to experiment with a system in a simulated environment.

Where simulations focus on adequately modelling a certain system (and use that model to estimate effects of changes on the real world system it reflects), *simulation games* focus on *learning through experience*. Games can also be supported by a computer model [20], but in most cases the computer model is for support only, and the game is played by participants with a large degree of freedom [20]. This is the domain where the game described in this paper fits in.

Simulation games are used for a variety of purposes. For example business games to teach people (e.g. students) how their decisions work out in practice [9]. There are other methods both to actively disseminate knowledge among stakeholders and to collect ideas from practitioners. However, gaming is the only method in which people from practice are an active and intrinsic part of the model they are working with.

As our game draws on the Web 2.0 philosophy, the primary goal is to tap into the knowledge of people from a certain organization ('wisdom of the crowds' principle) and to actively involve them in the process of identifying issues in the current situation and collaboratively working towards solutions, thereby facilitating change management and the commitment of various stakeholders. It is thus not a method developed to disseminate (theoretical) knowledge, for which – for example – e-learning systems could be a valuable alternative. For our purpose, we could not find any games currently described in literature. For simulation on the other hand, there are some descriptions of applications to the public sector and e-government (e.g. [14, 18].

3. A GAME FOR PUBLIC SERVICE DELIVERY

3.1 Background and Goals of the Game

Citizens and businesses use multiple channels to interact with government organizations. As a consequence, those organizations receive information and service requests through various channels and may use yet other channels to process this information or respond to the request. Due to the fragmented structure of many government organizations, the services and channels that may be involved in a single service delivery process may be located at various departments or even at different organizations altogether. This complexity further increases due to the often significant level of autonomy those organizations and departments have, for example in maintaining their own channel configuration, channel strategy, processes and information systems. Even departments or organizations that do not have direct interactions with citizens and businesses are often involved in the service delivery chain, and therefore add to the complexity. A service request can be made via one channel, but may require information from another organization and be responded to trough another channel, operated by another department. There are a large number of interactions and dependencies contributing to the complexity, which is illustrated in figure 1.

A simple example can illustrate this. Consider a person that moves to a certain municipality. This person has to register the change in address within a couple of days. For this, he has to go to a service desk at his municipality. There he has to prove that he lives at the new address, for example using a proof of ownership or by displaying a rental agreement. This limits the possibilities for changing addresses online. If this person rents the home from a housing corporation – which is quite common in The Netherlands – other service configurations are conceivable. Since there are often just a few (or only one) major housing corporations in a single municipality, the housing corporation can be regarded as a trusted partner of government, which is for example trusted with electronic notifications on new tenants, so the tenant does not need to obtain a paper document and show it at a service desk but can just make the change online (the proof is submitted electronically). Other options, but far more

complicated, include opening up the municipality's registration to the housing corporation and enabling them to make changes (e.g. people moving in or out) themselves.

To enable such innovative service delivery, the many dependencies that exist in this complex organization- and channel structure need to be coordinated [24]. A system consisting of multiple channels and multiple organizations can serve a wide variety of functions. Therefore, the dependencies between those functions can take various forms. There is a vast number of ways to offer services to citizens and businesses [2]. One strategy – for example – is offering integrated services in one single location, whereas an opposing strategy is a complete decentralization, with coordination based on peer-to-peer principles. Private parties can play a major role in service delivery and can be used as a service delivery channel. Private parties might offer an integrated package and take care of the interactions with government organizations for their customers [16].

When designing effective multichannel management, various options need to be explored, problems identified, and collaboratively solved. A simulation game offers the flexibility to explore various options and discuss the choices that have to be made, in which the various stakeholders can actively participate. Primarily the generation of ideas can benefit from applying Web 2.0 principles in order to tap into the collective intelligence of people [1]. The individual stakeholders bring in their own narrow view and experience, and assess the problem and possible solutions from the perspective of their own silo. However, the collaborative setting enables them to transcend the boundaries of their limited view and to gain a broader perspective on the problem and possible solutions. The game thus focuses on the involvement of various stakeholders in identifying bottlenecks in current service delivery processes. It is important to let participants *experience* the consequences of the choices that they make regarding the optimization of service delivery and the development of arrangements for improving service delivery. The flexible setting also facilitates the development and assessment of alternatives, including assessing the possibilities to extent the network of service partners with private organizations and the additional requirements this puts on the coordination configuration.

3.2 Game Design

The game consists of four general phases, an introduction, a round of play (in the first iteration, the current situation is played, in a second round, alternatives can be played), collaboratively developing alternative approaches, and evaluating the rounds of play as denoted in figure 2. Note that the play and collaboration phases can have multiple iterations. Our game is designed to have two round of play, where the second round is used to play with the alternatives that were developed in the collaboration phase.

The game design itself is preceded by research into a specific (set of) service delivery processes at the organization playing the game in order to make the scenario for the game as realistic as possible. Realism is important for the awareness of the participants as well as for the validity of the results of the game. The pre-game research results in a use case or scenario that is played in the game itself, and thus forms the basis for the specific role descriptions and situation descriptions of each individual session. Note that the development and validity of the scenario is not a goal in itself, but is used to facilitate the play by the participants. For various types of problems or participants, the scenario can be adapted to match the goals of a game session. The scenario is based on the status quo and serves as the starting point for experiencing problems in the current situation and for a phase of collaboration, in which out-of-the-box thinking is important.

During the collaboration phase, participants are asked to tap into their knowledge to develop and evaluate alternative approaches to the service delivery process. An example of such an alternative configuration is a redesigned business process, but also leaves room for a more radical reconfiguration of the service network, for example by enabling private parties to intermediate government services. This phase can be followed by a reiteration of the second phase of the game, in which the alternative configurations are played, experienced, and evaluated. To enable a dynamic situation that allows for maximum flexibility, thus enabling participants and

a bottom-up approach, the game is designed as a role-playing game, and not as a computer simulation, website, or other technology.

In the evaluation round the facilitators encourage the participants to compare the rounds of play in order to identify how solutions worked out, which barriers are resolved and which still exist. Finally, it will be discussed how the results of the game can be translated into real-life practice to ensure follow-up on the game's outcome. Throughout the evaluation and reflection phases, the facilitators play an important role since they know the content of the roles and the problems that were part of the game. They know the process and hurdles in the game and can trigger a discussion by asking participants (in the order of the process steps, for example) their experiences and problems encountered. The phases are summarized in figure 2.

Figure 2: game phases

3.3 Session Design

The game design consists of four elements; rules, roles, objectives and constraints. The objectives remain – intentionally –broad for the participants. We do not want to limit their solution space by setting a fixed couse of action. Therefore, the objectives are first to identify problems in the status quo and, next, to analyze the problems and develop a solution to overcome them.

The role-descriptions make sure that certain problems surface in the first round in the game. There is, for instance, also the role of 'the citizen' in the game. The role descriptions facilitate that a certain course of interactions are followed that leave the client with a frustrated feeling, while still realistic for the person playing the role of the service desk employee. In the game there are six roles: the three most used service channels: *telephone*, *front desk* and the *website*, the *citizen*, the *back office* and a *partner* (within or outside the

government). Depending on the number of participants, there can be multiple players for each role (e.g. multiple clients).

The rules of the game define the way the players are allowed to interact. Where the rules limit the game itself, the constraints limit the players in their options for activities that are legitimate under the rules. In the example we introduced earlier, there are legal constraints making it very difficult to provide access to government's registries to non-public organizations. The game offers the flexibility to discuss the rules and their real world exponents. This can even result in a discussion on the appropriateness of certain legal constraints and the need to change laws.

4. PROOFING THE GAME

4.1 Pre-game research

To test the game we developed a session for a medium-sized municipality in the Netherlands. Although this particular municipality is nationally seen as a good example of a service oriented government agency, this does not mean that all their services operate smoothly. Some are performing very well, whereas other services can be improved. To develop the session, we conducted a series of interviews with service managers and product specialists. When examining the current service delivery at this municipality we found that there are two services that show very different channel use. Statistics show that registering a change in address is by far and most done at the front desk, even though there is an electronic form available, both at the regular website of the municipality and at a personalized internet portal (but often additional proof is needed). On the other hand, for the parking permits over 70 % is requested online. These two services represent two categories, one that is successful using electronic channels and one that is not so successful at that. It is unclear why there are such great differences in channel usage. Since these two services show the most extreme cases of high and low use of

the internet channel, we selected both for the session. The next step was to investigate the current service delivery. This is done by specifying current processes and procedures, and by identifying issues in the processes that can be used in the game.

4.2 Session setup

There are two service processes that are simulated in the game. The role descriptions of the channels are supplied with information and tasks regarding both processes. There are also two sorts of client questions in this game; one on moving from one address to another, and one on a request for (or change in) a parking permit. There was a workload of 60 client questions in total (each about a change in address or a request for a parking product), played by multiple persons playing citizens. Processing a client question can take up to several minutes, depending on the complexity. Two partner organizations are represented by the roles of a housing corporation and the government's vehicle registration agency. Due to a limited number of players the latter was played by a facilitator (also because it only served as an information provider).

For someone changing his address, the situation seems quite simple. He either rents an apartment or owns the house he is planning to move to. Some clients have the instruction to register the change in address online. However, a clients that rent an apartment also needs a form that is signed by the housing corporation, stating that the owner allows that person to live on that address. So, the client has to go to two places: the housing corporation and the municipality. It would be more convenient if the housing corporation would be allowed to register the change in address for the client. This reduces the burden for the client and it allows municipality and the corporation to keep their records synchronized.

In the second case the clients usually submit a change in car ownership online, which is processed the next day by the back office. However, since this is processed overnight, it is not possible for someone that moves to the municipality to change his address and request a parking permit at the same time.

The housing corporation and the vehicle registration agency are included to facilitate alternative service configurations. It is conceivable that, being a large housing corporation, the municipality would set up a relationship with this corporation enabling direct (electronic) interactions through which the corporation submits updates directly. And since there are many interactions, the municipality does not require all additional forms every time, but only once. This enables a situation in which the tenant does not even submit his change in address, but this interaction is mediated by the housing corporation. The housing corporation is willing to do this, but also wants access to all registrations on their houses so they can also remove a registration when someone has moved out. For a citizen that bought a new car, it would seem quite logical if the vehicle registration agency, which is also a government agency, informs the municipality of the change in car ownership and the client would find a new parking permit in his mail the next day, without having to fill out a form online. These are, of course, possibilities that are built into the game, but may be neglected by the participants for a variety of reasons. The variety of options are available to trigger out-of-the-box thinking. Participants need to transcend the boundaries of their own silo's, collaboratively work towards solutions and see the contributions and views of other stakeholders, compliant with Web 2.0 thinking (but not the technologies).

4.3 Results

The roles were allocated to the municipality staff and the game was intended to be played according to the phases and the two rounds we discussed in the previous section. The problem solving round yielded a discussion about the role of the municipality in general, and the various back offices, systems and service delivery within that municipality. For the change in address they developed (also in practice) a configuration in which they established a collaborative agreement with the housing corporation, enabling the corporation to intermediate address changes for their tenants. This is greatly appreciated by the clients, but the participants at various roles found out that there is more to it. First, they identified the issue of technological interoperability. But the participants also felt that, since the municipality had to rely on the housing corporation there was a need to

establish strict agreements and to allocate responsibilities and accountability. Furthermore, they found policy and legal hurdles that limited further collaboration, for example on full access to the municipal records. They identified a cooperative approach to coordinate the multichannel service delivery. The corporation then acts as an extra service channel, next to the already existing ones.

The second process concerns the change of ownership of a car. The game participants could think of a similar arrangement of collaboration with the vehicle registration agency. Their initial thought was that this was probably going to be easier, since the vehicle registration agency also is a government organization. However, equivalent to the real situation, the vehicle agency is semi-autonomous and has to execute tasks set by law and is given a certain budget for that. To implement a direct link with the municipality was, for them, an extra task outside of their range of responsibilities. Therefore, in the game setting, they required of the municipality that the entire process of enabling and testing the direct link was paid for by this single municipality (even though other municipalities could potentially benefit as well). In reality, due to a lack of coordination among municipalities, this is a typical collective action problem in which the benefits to all are not realized because single municipalities are not prepared to take on all the costs. In the simulation game, the participants decided that the added value to the service process was very limited (the online service of the municipality was easy and popular), and given the costs they decided against it and maintained the status quo.

The participants indicated that they found the process of developing and playing with alternative coordination configurations very valuable. In the discussion phase we found that the participants generally felt that agreements and cooperation (both within the organization and with parties within and outside the public sector) should be improved, since it is key to the successful improvement of public service delivery. However, there was little consensus on the role the government should play (e.g. as a coordinator in a network of organizations). The discussion also indicated that it is necessary to align visions, services, departments, systems and information better in order to achieve proper multichannel management. Furthermore, we evaluated the game itself – as a

social development instrument – with the participants. They indicate that the added value of the simulation game cannot be explained, but has to be experienced. The game was seen as a valuable instrument to include various stakeholders with various views in the identification of issues, and in developing and experiencing alternatives. In the evaluation, participants of the game indicated that they think that "action and reflection were well in balance", that "a game is a good way to gain insight in complex things", and that it results in a "valuable discussion". Consistent with Web 2.0 philosophy people are willing to share and collaborate in order to use the collective intelligence of the participants to improve the operations of the organization.

5. FINDINGS AND FUTURE RESEARCH

Simulation gaming is a suitable instrument for participative policy-development, incorporating the principles and philosophy of Web 2.0. In a simulation game, people play roles and interact with each other within the rules of the game. During the game, situations can be changed to experience alternative scenarios. When playing the game, the value of simulation gaming for policy-making is clearly demonstrated as it includes people throughout an organization to develop solutions for complex problems. Various stakeholders each have their own specific view on problems, but lack the broader picture. The feedback we received from the participants clearly indicates that they felt that the game provided added value and that it is a valuable experience.

However, we acknowledge that this does not objectively prove that the game adds value for an organization. Therefore, the (academic) added value still needs to be established. For this, we will develop a survey to more thoroughly investigate participant satisfaction and the quality of both the collaboration processes and the outcome of a game session. In the participants' opinion the game is a instrument that can be used to raise awareness and confront participants with problems and possible solutions. One of the participants suggested that this game could be the start of a change process aimed at improving service delivery, as all participants had

a shared idea of the problem after the game that they did not have before. It also strengthened the

commitment of the participants to such a process. The main advantages include:

- "Wisdom of the crowds" approach, using the collective intelligence of the organization to identify

  problems and develop solutions;

- Rich user-experience, resulting in shared understanding of complexity;

- User-generated solutions by enabling social collaboration;

- Co-creation, resulting in commitment to the outcome and an understanding of solutions due to active

  involvement in the choices;

- Leveraging long-tail by offering the flexibility to include – besides standard processes - many variations;

- Participant control of the game, facilitated by the flexibility to change the game when playing, introduce

  new solutions or re-allocate roles;

- Commitment by the participants to a course of action identified in the game.

These advantages are consistent with the key Web 2.0 principles. The involvement of 'the crowd' within an

organization respects the complex dependencies that exist in change processes, where authoritative top-down

change processes may fail. However, the game does not automatically lead to valuable outcomes. We found

that proper facilitation is very important to enable a successful session of the game, and to translate the in-

game findings to real-world situations. Good facilitation is thus needed to tap into the collective intelligence of

the participants. With good facilitation, the game session at the municipality shows that the game is suitable for

creating awareness and for the identification and development of alternative solutions. The game can be used

to substitute the "authoritative-know-all" approach by a "wisdom of the crowds" approach, incorporating the

social collaboration that is key in Web 2.0 thought.

Although not a policy game, the game can also help to enhance the knowledge required to understand various policy actions that are possible, and to evaluate the implications by experiencing it in a game. Even in the case of the parking permit for the new car, in which there was no alternative solution adopted, the participants gave us insight into the various configuration options available to them and how they decide on those options and for what reasons. This will help to create an overview of coordination problems and possible solutions. It can also be used as part of a transformation process. The general design of the game might be sufficiently generic to adapt it to other issues in the public sector. The applicability of this concept to other games (e.g. a management game) will be subject of further research.

The game proved of great relevance and usefulness for the participants and currently there are more government organizations that have requested us to translate and customize the game for their specific situation in order to play it with their decision-makers and staff involved in public service delivery. This demonstrates the great potential of gaming for improving integrated service delivery and dealing with complex problems in public service delivery. However, since a part of the value comes from proper facilitation of the process, good facilitators with an understanding of multichannel problems and possible solutions are required.

Finally, this illustrates that the Web 2.0 philosophy is also applicable outside the traditional Web 2.0 sphere, in participative methods such as this simulation game. With the game, stakeholders can use the collective intelligence of people with various roles and backgrounds to improve the operations of an organization by developing a shared understanding of problems and possible solutions. The game provides a social arena to collaboratively work towards improved service delivery. Other issues, developments and innovations that are characterized by high levels of complexity might benefit from the same philosophy as well, even outside its original scope and form.

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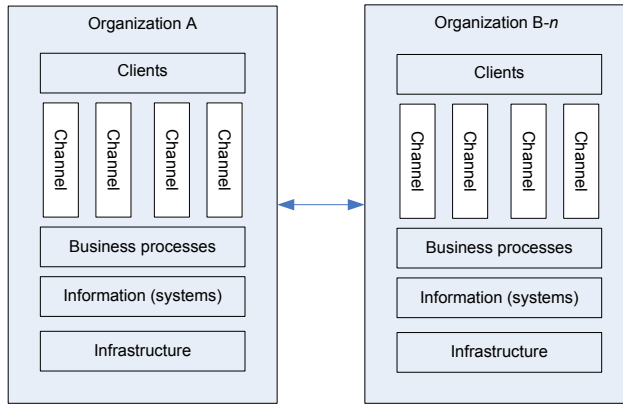
Figures

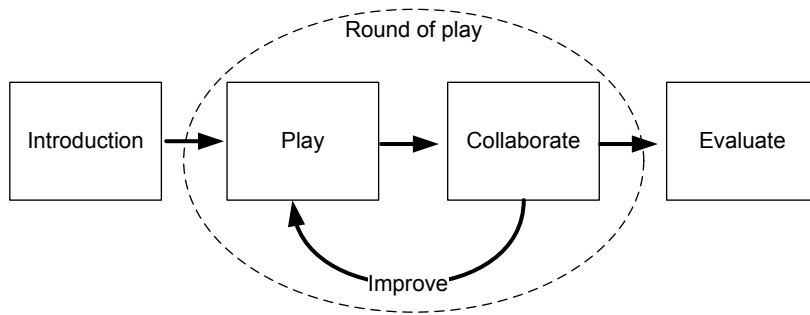Figure 1: multiple organizations and multiple channels [15]

Figure 2: game phases