SIMULATION FOR UNDERSTANDING COLLABORATION IN A VIRTUAL PUBLIC COUNTER

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ABSTRACT

E-government is emerging as the new way for government to provide services to its constituents. Local government organizations have to collaborate with each other in a virtual public counter to offer a one-stop shop. Many hurdles need to be taken and decisions need to be made before virtual counter can be realized. Public servants are, however, often not aware of the collaboration problems they have to deal with when designing a virtual counter. In this research simulation is used as an instrument to make government officials aware of collaboration problems.
In this paper a simulation study aimed at making government officials aware of collaboration problems they have to deal with when designing a one-stop shop public business counter is presented. First the background and nine collaboration issues are discussed. Thereafter simulation models are presented modeling these collaboration issues. The effectiveness of these models has been evaluated using a workshop and a survey. The models were found to be effective to widen the horizon of government officials and to focus on organizational issues of collaboration instead on a limited number of mainly technical oriented issues.

INTRODUCTION

Collaboration between government agencies is necessary for integrated services provision. Currently the service provision in the Netherlands has a highly fragmented nature. Politicians pay an overwhelming attention for more customer-oriented services provisions. Public administrations are urged by politicians to stay closer to citizens' every-day life, and act more proactively (Peristeras and Tarabanis 2000). In this respect, a virtual business counter should provide a one-stop shop for interacting with multiple agencies providing various kinds of services.
During the various years, there have been three pilot projects initiated to design an integrated, one-stop shop virtual counter. The benefits remain limited despite the high ambitions and investments made in these projects. The implementations of the three virtual business counter remains largely limited to a website containing hyperlinks to the information and services on the websites of the organizations involved. The organizations feel that the problems are mainly organizational and not technical in nature. So far decision-making between the three parties has largely been focused on technical issues, like web-hosting, the layout of the webpage and which of the existing services should be presented on the webpage. This research is *aimed* at creating awareness of complex collaboration issues in a virtual business counter required for coherent service provisions using simulation. An important part of this research is the evaluation of the effectiveness of simulation, as the civil servants are not familiar with and used to simulation.
In the first part of this paper the main collaboration problems that need to be resolved in the business counter are investigated. We clustered the problem into nine issues. These issues are interdependent and should not be considered as classes that exclude each other.

1. Redefining and allocating roles and responsibilities;
2. Legal responsibility and liability;
3. Organizational structure;
4. Integration and ownership of services;
5. Position of the physical and virtual counters;
6. Range and types of services;
7. Service levels and quality assurance;
8. Customer trust and loyalty;
9. Use of Information and Communication technology (ICT).

In the second part of this study, simulation models of the current situation and of a situation with a virtual business counter are constructed. These models are made for creating awareness of the nine collaboration issues. The model with the virtual business counter is aimed at attracting attention to the collaboration issues and provides no solution for the collaboration issues open, e.g. no responsibilities are defined or showed, no data is integrated. In the last part the contribution of the simulation model for creating awareness of

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collaboration issues is evaluated using a workshop and interviews. At the beginning and ending of the workshop the participants were asked to identify collaboration problems influencing the design of a virtual business counter. The insight gained during the workshop is evaluated by looking at the difference between issues.

COLLABORATION IN THE VIRTUAL COUNTER

Collaboration is the reciprocal and voluntary agreement between distinct public sector agencies to deliver public services. At an institutional level a complex mixture of cooperation and conflict emerges when organization start collaborating across traditional organizational borders (Kumar and Dissel 1996).
Three types of organizations cooperate in the virtual business counter; municipalities, the regional Chamber of Commerce and the regional Dutch Taxes. Civil servants of the three organizations have little incentive to improve their services. During the period 1999-2002, central government has provided funding to create incentives necessary to create a virtual counter. Public organizations rarely change in any top-down manner (Andersen 2002). Therefore the organizations have been given the freedom to design their own virtual counter and three different pilot projects have been funded. In this way gain experience with an integrated public services provision to businesses is created. The business counter was aimed at accomplishing the following three goals.

1. The reduction of the administrative cost of businesses;
2. An increase of customer satisfaction of government service provision;
3. The increase of efficiency of government organizations.

The evaluation of these three project showed that the current structures of the virtual business counter often reflect the history of the organizations and only a small portion of the high ambitions are realized. The services provided can be positioned in the catalogues and transaction phase of Layne and Lee (2001). Overall, the three virtual counter projects have created a web-presence containing product information, there are some downloadable forms for a limited number of services and for a limited number of services it is possible to conduct online transactions. In the latter case, transactions are performed without any direct integration of front- and back-office applications and the information and services are provided using hyperlinks to the websites of each organization. The stages of horizontal and vertical integration of Layne and Lee, characterized by integration of information systems across different functions and departments, are still far away.

The evaluation of the pilot projects showed that the benefits obtained remain limited despite the high ambitions and investments made. The evaluation showed that mainly technical issues are addressed, whereas the organizations feel that the problems are mainly organizational and not technical in nature. Integrated service provision requires that various collaboration issues having an organizational nature are addressed. Before these can be addressed, participants should become aware of the collaboration problems.

COLLABORATION ISSUES

A generic problem of virtual counter is that they are fairly difficult to operate as a virtual counter is a boundary- and function-spanning endeavor. One request and business process drives more than one organization. Individual organizations are expected to do what is best for the virtual counter, this is not necessarily what is best for them. Information must be made available to the right companies and somebody has to be responsible and given the means to control the status and progress of processes. The current problem is that there is no structured way to provide insight into collaboration issues surrounding the realization of the virtual counter. Insight is necessary to create awareness of the issues and to make them discussable. Only thereafter they can be addressed and solved. Simulation should support creating insight into the nature of the complex collaboration issues that are discussed hereafter.

1. Redefining and Reallocating Roles and Responsibilities

Collaboration requires rearrangement of organization roles and responsibilities and identifying new responsibilities. In the pilot projects responsibilities are assigned by trial-and-error experiments. A more fundamental approach is necessary where roles and responsibilities are identified and assigned consciously.

New cross-organizational roles and responsibility need to be established, e.g. who is responsible for monitoring service levels, who initiates action to increase service levels. Organizations need sound organizational procedures, such as requiring the consent of two individuals before changes can be made influencing more than one record.

2. Legal Responsibilities and Liability

Many of the organizations roles are founded in laws and regulations. These organizations have a legal duty and are responsible for services provisioning. Laws and regulations often block collaboration in a virtual counter. For example, the Dutch taxes have the duty to collect sales taxes, which blocks the road for collecting sales taxes using another legal entity. It is unclear

which functions might be executed by a virtual counter and who is liable.

3. Organizational Structure

Each government organizations have already created an own website in the past. In the pilot project no new organizational structure has been created. The organizations who took the initiative, the chamber of commerce, established a website merely consisting of hyperlinks to the individual websites of the three government organizations involved. A virtual counter consists of content available at other websites in the pilot. There are other structures possible which could resemble a network organization (Alstyne 1997). In a fully virtual counter the processes are arranged in such a way that the virtual counter is experienced as one organization by its' customers. They would no be aware which organization has provided a service. Processes are dynamically established and seamlessly integrated across organizations. This collaboration issue should draw the attention to the need to organize the virtual counter as a network organization.

4. Integration and Ownership of Services

In the pilot projects services are still provided by each organization and no interdependent services were developed. Three forms containing similar data are used to request services from the three organizations. A virtual counter provides the opportunity to use one form to request services from all three organizations. The use of one form gives rise to the ownership question. Various kinds of conflicts exist with the integration of services.

- Ownership of the data in the authentic registries;
- Ownership and control of the network connecting the authentic registries;
- Control and ownership of the web-applications.

Data is treated by the organization as a valuable asset. The collaboration faces issues about the ownership of the rights of data. The Dutch government uses the principle of *authentic registrations*. This principle states the organization who gathers the information at the sources, is responsible for keeping information up-to-date and for distributing the organizations to other organizations. The core-business of government is often based on the information in these authentic registers. The services currently provided by a municipality are only provided by that municipality because it owns, controls and maintains the citizens authentic register. When another organization, like the virtual counter, would control and maintain the citizens authentic register they might lose their right to exist. Simulation should draw the attention to this issue.

5. Position of the Physical and Virtual Counters

Currently the three organizations have their own physical business counter. A virtual counter demands the support of a physical counter, as often consults are necessary to support the provision of services. Currently the chamber of commerce provides consults to entrepreneurs, as this is part of their core business. The tax organization only provides consults incidentally, as they are primarily responsible for collecting taxes. The municipality provides consults to certain industries, e.g. they advice about safety measures to the hotel and catering industry.
The operating of the virtual business counter should take into account that consults might be necessary. The virtual counter should make the correct reference to the physical counter of each individual organization or to the possible one-stop physical counter. Simulation should provide insight into the different possible positions of and relations between the virtual and physical counters for providing a one-stop shop. In this way this collaboration issue should become part of the discussion.

6. Range and Types of Services

Service provisioning is very limited and has a low level of integration in the pilot projects. The services brought online are some of the services currently provided by the individual organizations and did not include services requiring the collaboration between the three organizations. As such the virtual counter is only seen as new channel for making a selection of existing services online, instead of making all services online and providing new, innovative and/or integrated services.
A simple new service that solves the customer problem of entering similar data multiple times was not solved by two of the three pilot projects. Data can be re-used by using a virtual counter and collecting data centrally. Another example of a new service could be the simultaneous registration by entrepreneur in the trade registry of the chamber of commerce and in the tax register of Dutch taxes. Providing progress and status information about the status of a services is more complicated, as the status is determined by individual organizations. In the example, information about the status of the registering procedures of both organizations should be collected and appropriate measures should be taken when registering takes too long or the resubmitting of the registering request when information is loss. This collaboration issue should make the case for new types of services.

7. Service Levels and Quality Assurance

Each organization executes its own processes and has its own responsibilities. The relationships between the collaborating parties are interdependent and need to be specified. This quality assurance can be achieved by service agreements levels (SLAs) or contracts between organizations. SLAs express that service of a certain level has to be provided (Looijen 1998). SLAs can

express criteria like availability, access to each other's data, response time, reliability etc.

8. Customer Trust and Loyalty

A (virtual) business counter provides a new way for businesses to deal with the government. Decisions made by the government can have a profound effect on the management of businesses. The careful and skillful handling of business- interactions can influence the success of the business counter. Trust plays an important role in the development of electronic relationship (Hoffman et al. 1999). As the businesses have experience with the municipality, taxes and chamber of commerce and no or limited human interactions are possible within the virtual counter the creation of trust is essential.

9. Use of Information and Communication Technology

The use of ICT is about technical issues like the web server needed for hosting the website, the design of the web pages, the maintenance of hyperlinks, the protocols for exchanging data and the use of standards. Technology standards affect the threshold to participate. The choice of standards can affect the costs of organizations negatively. When an existing standard of an organization is chosen and another organization do not support it yet, high costs can be necessary to comply to these standards. Most of these issues except standardization are already addressed by the three pilot projects.

SIMULATION OF THE VIRTUAL COUNTER

The organizations involved in establishing a one-stop shop virtual counter needs support to be able to determine what make up a customer-oriented virtual counter. The raison d'être of businesses is to make money and the profitability can be compared, however, this is not the case for government. The local government organizations have no strong incentive to improve their service provision to increase customer satisfaction. For improvement a prerequisite is that they agree on the decisions. As a result they need insight into how collaboration can be best done from the customer perspective *and* their own perspective. The participants should share a long-term commitment and manage their interwoven relationship. The interwoven dependencies are time-dependent and should be dynamically visualized to identify collaboration problems.

Simulation of business processes constitutes one of the most widely used applications of management science / operational research, as it allows for understanding the essence of business systems, identifying opportunities for change, and evaluating the effect of proposed changes on key performance indicators (Law and Kelton 1999).

Lack of communication has been linked to numerous project failures (Pinto and Pinto 1999). An essential ingredient of communication is the use of visualizations to support communication between all kinds of stakeholders, investors, management, information architects, designers and programmers, many lacking technology knowledge. Visualization can help to translate the outcomes of the model to soft explanations, conclusions, recommendations, and requirements (Vreede and Verbraeck 1996). As such visualization can be used for critical debate about the fit between information system and organizational processes. Visualization support is often a standard feature of simulation. A visualization model is a graphical model of an empirical model of a problem situation. The main purpose of *visualization* is to facilitate the process of acquiring insight into the dynamic interactions of the modeled system, and to facilitate communication between parties involved in a dynamic modeling study (Vreede and Verbraeck 1996).

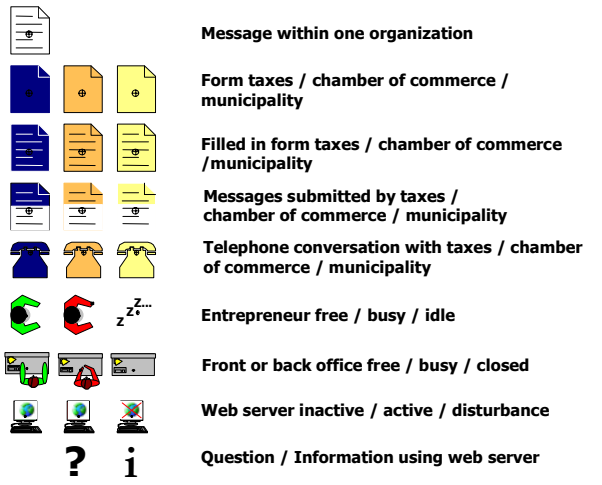

Figure 1: Explanation of Symbols

The *process* paradigm implies a way of looking at organizations based on the processes they perform rather than the functional units, divisions or departments they are divided into. In the current organization the three local government organizations can be viewed as functional units, each with a highly specialized set of responsibilities and expertise. Even the simplest business tasks tend to cross the functional units and require the coordination and cooperation of different functional units. The virtual counter should support cross-organization processes and simulation should visualize processes instead of functions and responsibilities. Only after the participants are aware of the processes necessary, tasks and responsibilities should be assigned to organizations. It is thus essential that in the simulation models the processes of a virtual counter will not be viewed as belonging to an organization. We do not want to give normative statements about ownership and responsibilities.

To support insight into the collaboration issues two simulation models were developed. Three types of services were incorporated in the models that were considered as suitable for providing insight into the collaboration issues. The explanation of symbols is shown in figure 1.

The simulation model of the 'as is' or 'current' situation should make the organizations aware of the need for integrated service delivery. A screenshot of the simulation model of the 'as is' situation including an explanation is shown in figure 2.At the bottom of the figure the back-offices of the three government agencies, municipality, chamber of commerce and taxes, are shown. At the right side of the back-offices the status of the requested services are shown. In the middle the post office is shown, with acts as an intermediary between the entrepreneurs and government agencies. At the right side of the counter the activities performed are written down. At the top three entrepreneurs having a need for services from the virtual counter are modeled. Also miscommunication, mistakes in data and processing faults are modeled.

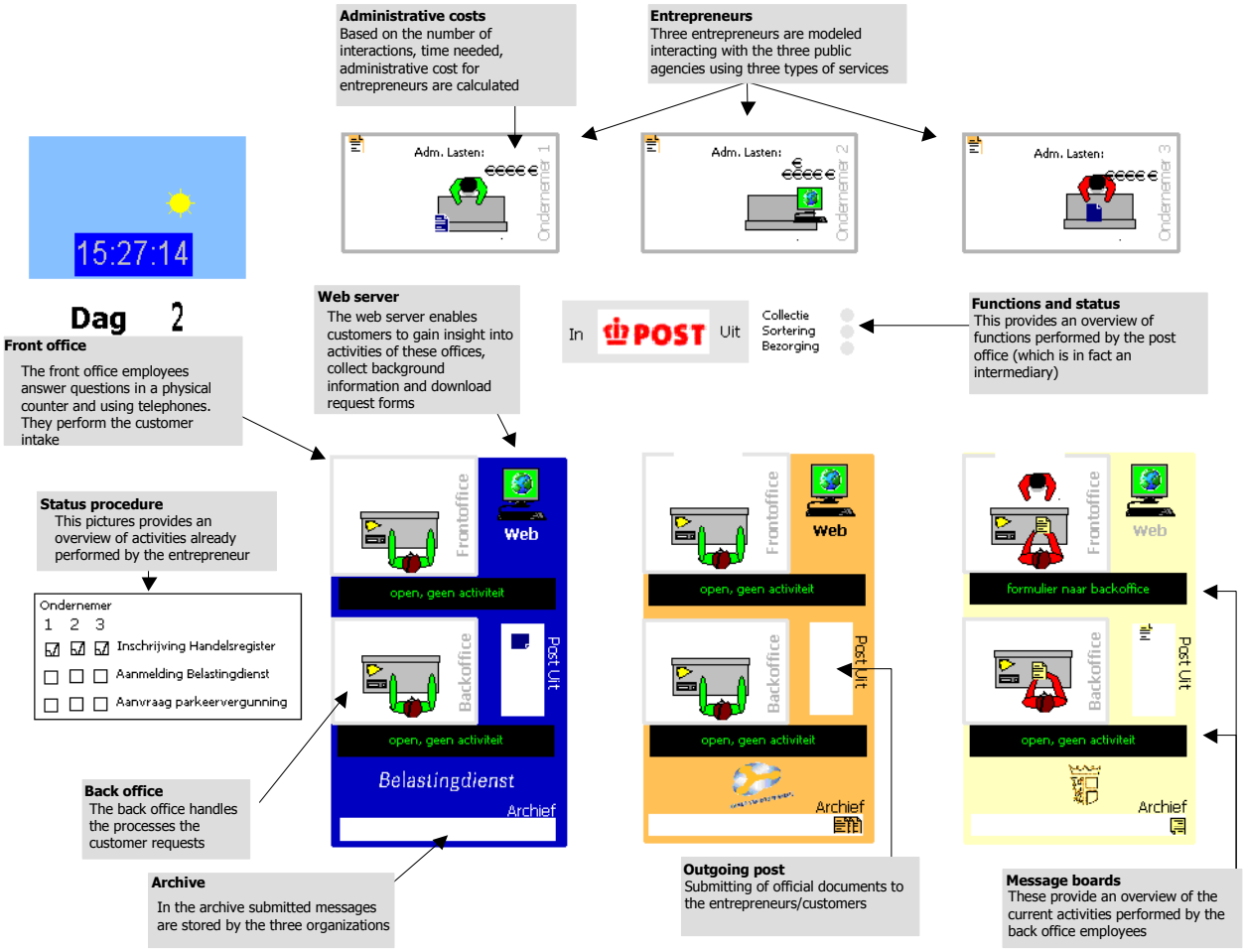

Figure 2: Screenshot of the 'as is' Model

The simulation of a virtual business counter *and* a physical business counter should make people aware of the nine collaboration issues. The simulation model of the virtual and physical counter is shown in figure 3. In the middle of this figure the physical and virtual counter are shown with make up the one-stop virtual business counter. At the right side the activities performed by the one-stop business counter are shown. Which government agency is responsible for the one-stop business counter is deliberately not included in the animation, as the aim is to start up a discussion about responsibilities and structures, e.g. collaboration issues one and three.

A number of functional components making up the application architectures are shown as well. The identification component is used to identify entrepreneurs as well as government employees. This could also be extended to a customer relationship management (CRM) system, to register all customer data, all interactions with the customer and to collect customers' information. From a customer perspective this could be extended a digital safe to store and reuse companies data. Apart from identification, an essential characteristic of this component is that data can be entered once and reused.

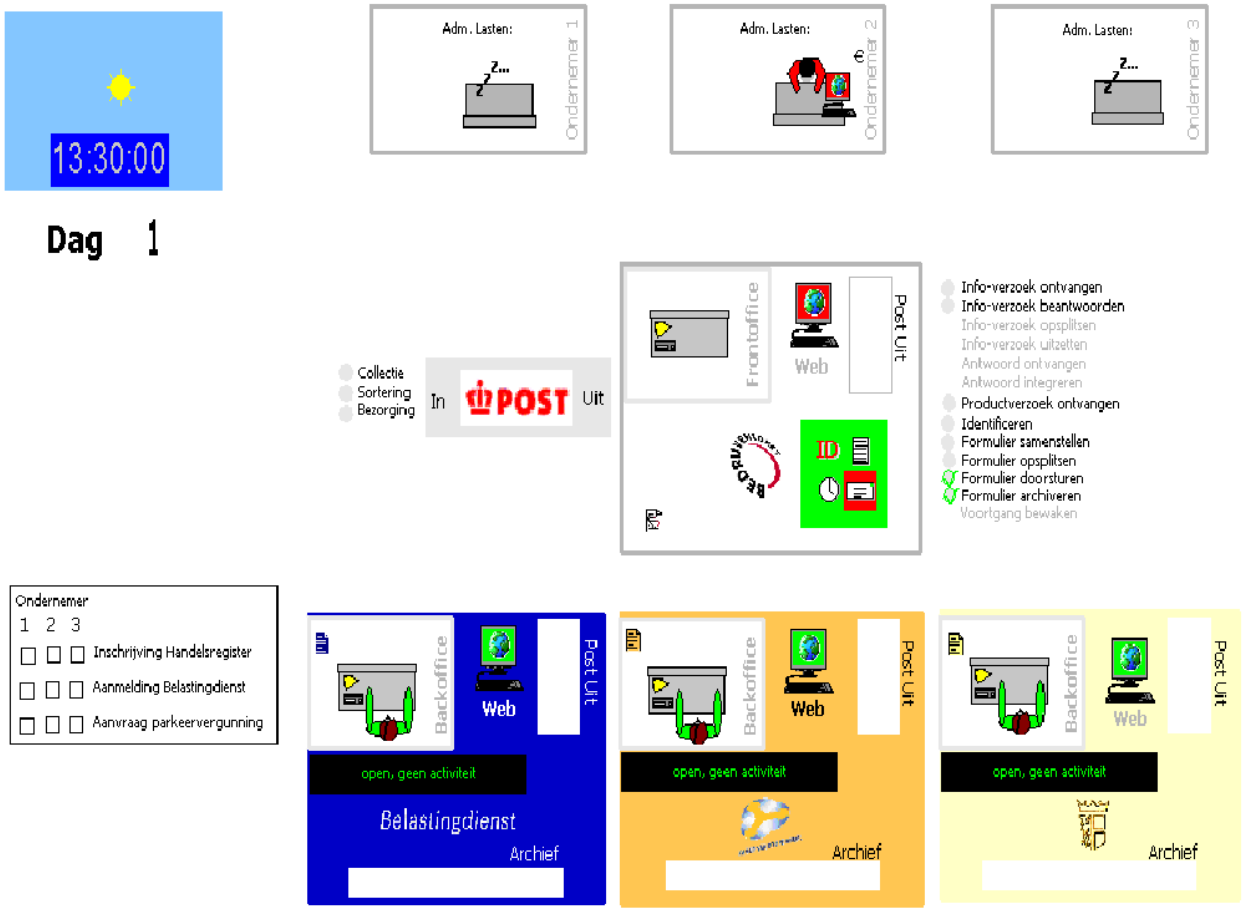

Figure 3: Screenshot of the 'to be' Model

Another component is an agenda system that can be used to let customers schedule an appointment with a government representative. Employees can provide data about their availability and entrepreneurs can make appointments. Long queues before the physical offices can be avoided by reserving time-slots prior to arrival.

The web server component is responsible for the communication between humans and information systems and can also include process orchestration and the tracking of status information of a service delivery.

The messaging component is responsible for exchanging data between information systems. In a general sense, legacy information systems can communicate with other systems using messaging. The communication with state-of-the-art components can be done using web-services. The messaging component can translate data formats into other data formats and can asynchronously exchange data based on message queuing. When an information system is not available the messaging component can queue up messages and submit the message at another time when the receiving component is available. The data formats are stored in the messaging application, so that control and maintenance of these formats can be done at one (central) location.

EVALUATION

The simulation model should help the participants to address the right collaboration issues while designing an integrated business counter. The evaluation aims at evaluating the effectiveness of the use of the simulation models discussed in the preceding section to create awareness of the nine collaboration issues. Our evaluation neglects the quantitative part of a simulation study. We want to prove that more insight is gained into collaboration issues using simulation than without using simulations. Checkland (1981) highlights the problem of proving that a support environment is better than without, but concludes that it cannot be proved. He suggests that two development teams could work independently on developing a system; however, the very fact that there are two sets of developers will undoubtedly influence the results. As a result Checkland concludes than we can only make plausible that our approach is 'better'. We follow Checkland and evaluate the effectiveness by looking at the collaboration issues that are know by the participants before and after the showing of the simulation models during workshop. This means that we are not able to measure a difference when the participants already

address the right issues and the simulation models do not bring about a shift into the focus on collaboration issues. We do not consider this as a major problem, because as the right collaboration issues are already addressed simulation models have no added value. The construction is then an extra effort that could have been avoided.
The models will be evaluated using two instruments, a workshop and a survey. In the evaluation workshop participants are asked to identify collaboration issues at the beginning and ending of the session. During the session the simulation models are shown and discussed. The difference or shift in issues tells us something about the effectiveness of the models. The survey is performed after the session and is used to collect the perception of the workshop participants about the different aspects of the added value of the simulation models.
In figure 4 the design of this whole research project, including the workshop is shown. For the purpose of clarity the first four steps, which are already discussed in the preceding part of this paper, are shown. First the existing situation was analyzed, than an 'as is' model was build, thereafter collaboration issues were identified and ultimately 'to be' simulation models were build. Thereafter the evaluation workshop and survey was performed.

Evaluation Workshop

The workshop is aimed at evaluating the effectiveness of simulation models by comparing the collaboration issues identified at the beginning and ending of the workshop. The workshop lasted one morning and was part of a one-day session about the design of a virtual business counter. A group of participants that were not involved in the design of the simulation models were invited to take part in a workshop. This group consisted of 10 participants involved in policy formulating of a virtual business counter and representing the tax organization, chamber of commerce and municipalities.
The first step of the workshop was the introduction including some background about the purpose of the session. During the second step the participants were asked the question to 'identify collaboration issues influencing the design of a virtual business counter to large extends'. This resulted in a number of collaboration issues perceived as being important to address in the design of a virtual counter. In the following step the simulation models of the 'as is' situation and 'to be' situation were presented and based on these model a plenary discussion was held. At the end of the workshop the participants were again asked the question to identify collaboration problems influencing the design of a virtual business counter to a large extends.

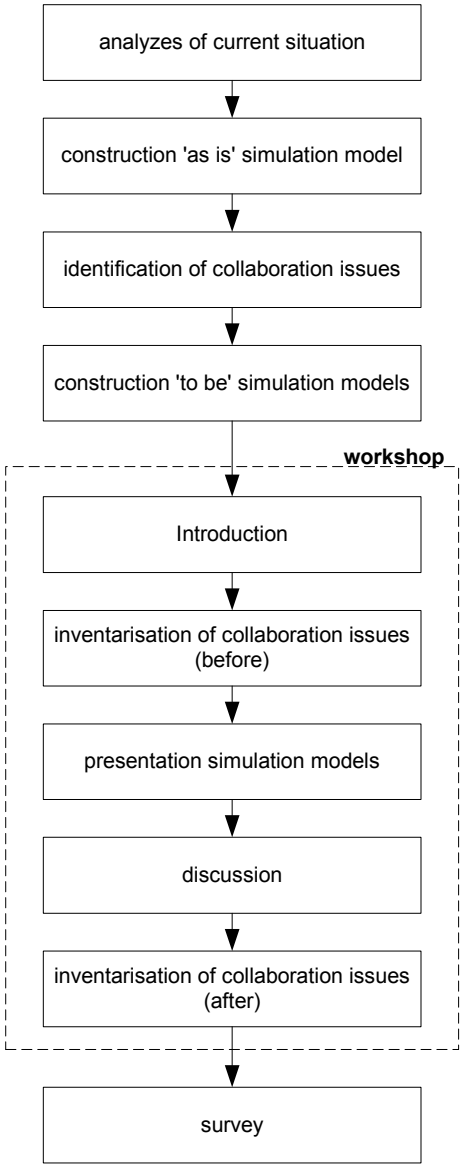

Figure 4: Workshop Design

The problems mentioned at the beginning and ending of the workshop were mapped to the nine collaboration issues discussed in the preceding part of this paper by the researchers. The main reason for this was to make the issues mentioned at the beginning and ending of the workshop comparable and to avoid spoon-feeding the participants. At the beginning of the workshop, they need to identify issues with their existing knowledge. For the purpose of mapping the comments on the collaboration issues we had to make some interpretations and abstractions, e.g. the response time is mapped to the collaboration issues 'service levels and quality assurance'. The results of the questions ask at the beginning and end of the workshop are shown in table 1.
At the beginning of the workshop the participants came only to a number of three issues. This limited number provides indications for the need for simulation models providing insight into collaboration issues. After the

workshop the participants generated six collaboration issues. Note that the issue 'use of information and communication technology' was mentioned at the beginning of the workshop as an issue influencing the design of a virtual counter, whereas this issue was not mentioned at the end of the workshop. When taking this into account, the participants became, the participants became aware of four extra collaboration issues, instead of becoming aware of three extra collaboration issues. In their opinions the ICT issue was not found to be an important collaboration issue influencing the design of the design of virtual counter. The new issues were 'Redefining and -allocating roles and responsibilities', 'Integration and ownership of services', 'Range and types of services' and 'Customer trust and loyalty'.

The participants did not found three issues important enough. The issues 'organizational structure' and 'synergy between physical and virtual counter' were not mentioned at the beginning and at the ending of the workshop. During the informal discussions after the workshop some participants indicated that these issues were not mentioned, because they already seem clear to them. The current organizational structures used in the pilot projects were not suitable and ideal seemed to be the establishment of a new organization consisting of both a physical and virtual part. The collaboration issue 'position of the physical and virtual counters' was already paid a lot of attention to. The participants were aware that operating of the virtual business counter needs also a physical counter parts as customer have a need for consults. Currently the chamber of commerce provides consults to entrepreneurs and the taxes and municipalities hardly provides any consults. The tax organization even does not want to provide consults, as they consider this the field of tax counselors. The municipalities are primarily interested in providing better services and reducing their administrative burden. Consequently the participants seem already to have agreed that the chamber of commerce should take care of operating an integrated business counter and providing a physical counter.

Table 1: Insight gained by simulation

Collaboration issue	**Before showing models**	**After showing models**
1. Redefining and -allocating roles and responsibilities		✓
2. Legal responsibilities and liability	✓	✓
3. Organizational structure		
4. Integration and ownership of services		✓
5. Position of the physical and virtual counters		
6. Range and types of services		✓
7. Service levels and quality assurance	✓	✓
8. Customer trust and loyalty		✓
9. Use of Information and communication technology	✓	

When comparing the issues mentioned at the beginning and end of the workshop in the light of evaluation of the effectiveness of simulation models to create awareness, it becomes clear that the participants are aware of more collaboration issues. Instead of the three issues they were aware of at the beginning of the workshop, the participants were at least aware of six of the issues. Additional interviews showed that the participants were aware of the three other issues, however, considered them as less influencing the design of a virtual counter. Most remarkable is that the use of ICT is mentioned as a collaboration issues at the beginning of the workshop, but is not viewed as an important collaboration issue at the end of the workshop. With the necessarily care we conclude that a broadening of the horizon to a focus on more organization-oriented issues has appeared. We have strong indications that our simulation models are effective instruments for creating awareness of collaboration issues in the virtual business counter.

Survey

After the workshop, the participants were asked to fill in a survey, containing questions about the usability and the added value of the 'as is' and 'to be' simulation models for each participant and for the contribution to the process of implementing the virtual public counter. Participants were asked to indicate in what degree they agreed or disagreed to each statement by giving each statement a score from 1 (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree) to 5 (strongly agree). They could also add comments to support the selection of their remark.

The survey consisted of nine statements. These statements are based on the two main aspects (1) the suitability of the simulation models as communication instrument (questions 1 till 3) and (2) the contribution to the insight into the collaboration issues (questions 4 till 9).

Suitability as Communication Instrument

1) The lay-out used in the animations is understandable.

2) The way business processes are performed is understandable.
3) In my opinion, the use of animations is of valuable importance to the decision making process on the virtual public counter.

Insight into Collaboration Issues

4) The animation 'as-is' provides an accurate illustration of the situation 'as-is' in reality.
5) The animation 'to-be' provides a realistic illustration of a possible future situation.
6) The animation 'to-be' resembles my vision on the virtual public counter, before having seen the animations.
7) The animations have changed my vision on the virtual public counter.
8) After having seen the animations, I think realization of the virtual public counter will be more complex than I thought before.
9) The animations have pointed out at least one issue that I did not have in mind before.

The nine statements and the mean score for each statement is shown in the table below. Where 1 is the lowest and 5 is the highest score.

Table 2: Survey Results

Statement		Score
Suitability for communication		
1.	Understandable lay-out	3.7
2.	Understandable processes	3.9
3.	Animation valuable tool	3.6
Insight into collaboration issues		
4.	Realistic illustration as-is	3.7
5.	Realistic illustration to-be	2.8
6.	To-be resembles own vision	2.7
7.	Vision has changed	2.8
8.	Realization virtual counter more complex	2.7
9.	New issues identified	3.2

When looking at the suitability as communication instruments the participants are positive about the simulation and animations models. The participants are positive about the understandability of the lay-out used in the simulation models and the business processes depicted by the model and found animation to be a valuable tool. In the first and third statements there was one neutral and one disagree score. It seems that those persons had trouble with understanding the layout of the animation models as shown if figure 1 and 2. This cause of this score could be due to a bad explanation process or due to the unclear models. We were not able to identify the main cause.

When looking at the insight created into the collaboration issues, the participants were positive about the realistic illustration of the 'as is' situation. Only the persons who have had troubles with understanding the layout out and business processes had selected the neutral and disagree option. What is striking is that the participants consider the animation of the 'to be' situation to be less realistic (statement five). When looking at the detailed data, we found that two participants disagree strongly with this statement. From the participants view the 'to be' models were too abstract and have less relation to reality. For example they found the choice to make no organization responsible for execution the physical and virtual counter not realistic. However, no organization was deliberately made responsible for executing the virtual counter, as the aim was to make participants aware of collaboration issue one, redefining and -allocating roles and responsibilities.

Another explanation for this low score on statement four can be found when looking at the even lower average score for statement six. It is likely that participants judge negatively on the contribution to the insight of the animation because the animation of the 'to be' situation does not resemble their own vision close enough.

When looking at the overall indication it seems that the participants were positive about the models understandable, however, they were less positive about the 'to be' models as the models were abstract, did not resemble their vision.

Statements seven and eight score also just below a neutral score. The goal of the workshop was not to change somebody's vision on the virtual public counter, moreover, the 'to be' model was made with the idea to have no or as little as possible normative resembles with some kind of implementation or vision. The score of statement 8 can be explained when looking at the starting points of this simulation projects, the implementations of the three pilot projects remained limited to a website containing hyperlinks to the information and services on the websites of the organizations involved.

The average score of statement 9, the number of new collaboration issues, identified is above average. Most participants did identify new issues concerning the virtual public counter and after all, the use of simulation was evaluated as valuable; none of the participants disagreed with this statement. This outcome seems to be conforming the outcomes of the evaluation workshop shown in table 1.

Informal communication after the workshop learned that the participants were quite positive about the use of simulation. One participant noticed that he would like the models to be capable of handling more scenarios and various visions. One participant stated that the models rather support the creation of awareness and by doing so support the decision making process. Another participant would like to see more detail in the animation of the ' to be' situation to point out the different functions of the virtual public counter.

CONCLUSIONS

In this research awareness of collaboration issues in a virtual business counter for integrated service provisioning was created using simulation models. From a government perspective the use of simulation should provide a vehicle to realize a higher level of ambition and from a design perspective the use of simulation models should help to make stakeholders aware of collaboration issues and in this way help them to focus on the right issues.

First collaboration issues were identified, thereafter, simulation models were constructed aimed at providing insight into these issues. The developed models were evaluated on effectiveness to create awareness of the nine collaboration issues using a workshop. This workshop showed that simulation models broadened the scope of the participations and helped to create a shift from an emphasis on technical issues to an emphasis on more organizational-oriented issues. Our simulation models seem to be effective instruments for providing insight into collaboration issues of the virtual business counter. The models helped to widen the horizon of government officials and to focus on organizational issues of collaboration instead on a limited number of mainly technical oriented issues. As such simulation keeps its promises and proved to be a valuable instrument for providing insight.

Now the participants are aware of the collaboration issues, further research can address the creating of a shared vision on the concept of a virtual counter. Various scenarios and a quantitative evaluation of each scenario to compare the added value can support decision-making. Another issue that needs to be addressed is the link to information and communication technology. The simulation models should also include the application architecture, the user-interactions and the interactions between applications to enable a growth path from an information and communication technology perspective.

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