

## Needs Driven Design for eGovernment Value Webs

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### Abstract

*eGovernment services are often grouped to so called life events in order to make it easier for citizens to identify relevant information and services in a specific situation. Examples for life events are: moving to another community or the birth of a child. Similar groups can be found for business contacts to government (B2G). In this article the authors focus on B2G contacts. The authors show that some B2G contacts can be seen as value webs consisting of more than only two actors. The findings presented by the authors suggest that eGovernment design should be based on requirements and needs of all actors participating in such an eGovernment value web. The article presents an approach to requirements elicitation based on characteristic features of B2G contacts.*

### 1. Introduction

The eGovernment discussion in Europe recently seems to be moving from supply-side aspects to demand-side aspects. This change is reflected by the growing number of reports and surveys focusing on eGovernment needs especially considering businesses as eGovernment power users [13, 14, 18].

In this article we present the findings of an explorative research project aiming at the identification of eGovernment requirements out of the business perspective. As a result of a series of qualitative interviews we can deduce characteristic features and phases of B2G contacts. Each characteristic feature and each phase of a B2G contact corresponds to specific expectations and needs and is crucial for the business estimation of the potential value of eGovernment support.

Besides, the findings show that B2G contacts very often consist of more than two actors. Government agencies as well as businesses cooperate with various partners in the course of a B2G contact: government agencies invite other agencies and specialists to evaluate an application, businesses cooperate with internal and external experts and consultants (architects, tax consultants, lawyers) to develop successful applications and correct documents.

In order to develop eGovernment solutions which respond to the needs of all participating actors the requirements elicitation should cover the whole B2G-value web (see [16, 20]).

The findings about characteristic features and phases of B2G contacts were therefore taken as the basis for the

development of a tool for the requirements elicitation in eGovernment value webs.

The article is organized as follows:

In section two the term eGovernment value web is introduced to describe the participating actors as opposed to the term business event or B2G contact which focuses on the process aspect. In section three we describe the findings of the explorative research project which lead to a new definition of business events since we want to consider more than just the two core actors of business and government. The characteristic features and phases of business events are described forming the basis for the deduction of design requirements.

Section four deals with the requirements elicitation approach for eGovernment value webs. Characteristic features and phases are used as key elements for the description of user needs towards eGovernment. The needs driven approach developed by Schwabe [17] comprises a set of perspectives which allow covering the needs of a value web. Together the findings and the methodological input form a new instrument for eGovernment assessment and design for eGovernment value webs.

Future implications of the application of the proposed instrument are discussed in section five.

### 2. eGovernment Value Webs

In the following section we will define the terms business events and value webs and explain the context in which they are used.

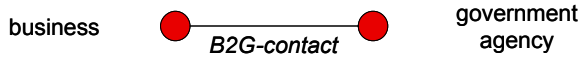
#### 2.1 Business Events

In order to give eGovernment portals for citizens a structure which reduces complexity and can be understood and used even by administrative laymen the concepts of one-stop shop and life events haven been developed. They both are based on a context specific combination of different government services disregarding which government agencies are concerned [11]. Examples for life events are 'marriage' or 'birth of a child'.

Similarly business situations or business events are developed for business specific eGovernment services [6, 12].

#### 2.2 Actors in business events and value webs

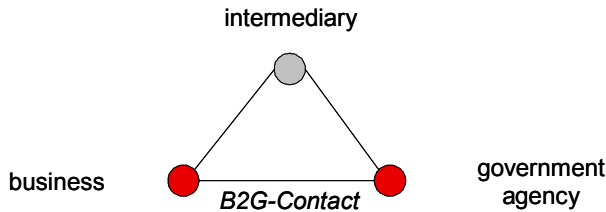
eGovernment transactions have often been seen as binary relationships between a government agency and a citizen or a business (see[12]).



**Figure 1: Binary Understanding of B2G Contacts**

Recently eGovernment research has introduced the aspect of intermediaries who serve businesses as well as government agencies during the eGovernment process [5]. Intermediaries as well as other stakeholders [1] or constituents [8] need to be considered in order to understand all aspects of a B2G interaction.

The aspect of intermediaries broadens the perspective on B2G contacts to cover at least three different actors.



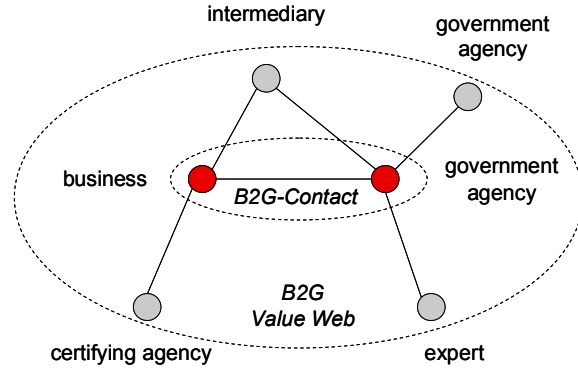
**Figure 2: Ternary Understanding of B2G Contacts**

However the triangular model of B2G contacts does still not cover all activities and actors which are connected to a business event out of the business perspective as well as from the government point of view. From the business perspective there are several contacts to official agencies like certifying agencies or insurance companies which are conducted in connection with B2G contacts and which are based on mostly the same data. In the context of the monitoring of environmental data, for example, many businesses not only collect and document these data for the government agency in charge but also for a certifying agency. The government agency itself cooperates with other government agencies and also with external experts.

In order to support all those transactions and cooperation processes between all relevant actors the perspective on business events is to be broadened to comprise the whole value web around the core B2G contact. For the design of eGovernment solutions for value webs all actors' perspectives are to be considered. In contrast to business value webs [24] most of the actors do not really have a choice whether to take part in a B2G process or not. They do, however, have the choice of the channel, electronic or paper based.

The term eGovernment value web focuses on the actor perspective whereas the term B2G contact focuses on the process perspective.

In the following section we describe our findings on features and phases of B2G contacts. Since B2G value webs often consist of more than one B2G contact, these features and phases are later on combined into an approach for the requirements elicitation in B2G value webs.



**Figure 3: Value Web around B2G Contacts**

### 3. Characteristic Features and Phases B2G contacts

In the following section we describe the empirical study, which was conducted with representatives of businesses and government agencies. Afterwards the findings on characteristic features and phases of B2G contacts are illustrated. Characteristic features and phases are then connected with their implications on the perception of eGovernment value from the business perspective.

According to the findings described in this paper the perception of potential eGovernment value depends on characteristic features of business events. Businesses expect some eGovernment solutions to be very valuable and use them frequently while they consider others useless and even more expensive to use than paper based transactions.

#### 3.1 Empirical approach

We conducted a series of qualitative, semi-structured interviews with representatives of business and government agencies in Germany in order to find out what were the characteristic features that influence this perception. The interviews discussed the processes and actors connected to a business event, the perception of the current mode of transaction and requirements for an integrated eGovernment solution – if regarded useful at all. We focused on two business events, each of them core of a B2G value web:

- building applications, environmental issues and industrial waste
- approval of new products and patent registration,

and we talked to representatives of the two branches automotive and chemical/ pharmaceutical industry.

	businesses		Government agencies
	medium sized	big sized	
building applications	2	5	17
approval of new products	3	4	4

**Table 1: Interviews on Business Events**

The business events chosen for the interviews are mostly handled by government agencies on a local and regional level. Therefore we talked to representatives in different federal states in order to discover regional differences. However the findings did not suggest any regional differences apart from region specific allocations of competences.

The interviews took 30 to 60 minutes and followed semi-structured interview guidelines. They were conducted personally and via telephone.

Business representatives were asked to explain the connection of B2G contacts to internal business processes and to describe the process steps of the transaction in detail. Afterwards the interviewees were asked questions on their estimation of the current mode of processing the B2G contact and potential improvements. The interviews with representatives of government agencies were done accordingly.

Interview protocols were analyzed according to the principles of hermeneutic content analysis (see [19]).

**3.2 Characteristic features of B2G Value Webs**

The interview findings suggest three characteristic features which describe B2G contacts especially out of the business perspective. These features are decision type, grade of routine and complexity.

From these features we can decide if and to what extend eGovernment support is desired for a specific B2G contact and derive requirements for the design of eGovernment solutions.

The features and the design requirements resulting from these features are presented in the following section.

**3.2.1 Decision type**

Businesses as well as government representatives perceive B2G contacts as either being subject to negotiations and interpretation of laws and rules or being strictly determined by rules without any room for interpretation (see [3]).

The statistical reports required from businesses by the German law are defined in detail and cannot be interpreted or customized by individual businesses. Handling of industrial waste is also very strictly ruled: Businesses have to follow a detailed routine of forms and requirements in order to organize the disposal of industrial waste according to the law. If all documents and forms are filled in correctly and in time, the government agency approves automatically without any room for interpretation.

On the other hand a building application is often subject to negotiations between the local authority and the applicant. Rules and laws referring to building only give a framework for government agencies to guide their decisions according to long-term regional plans and environmental safety. Therefore building applications are discussed in advance between applicant and building authority in order to get to know each other’s arguments and develop a successful building application. In case of important employers local authorities are interested in keeping them in their own community and tend to meet at least some of their requirements.

For the design of eGovernment solutions both of those decision types have specific implications:

In case of decisions which are strictly determined or cannot be called a decision but rather automatic information processing businesses as well as government agencies prefer to have their manual work reduced and to use automatic workflow solutions. Personal influence is neither required nor possible so it can be limited to finally check outgoing forms and information or review regular reports.

In case of negotiations or decisions with room for interpretation, appliers do not want to loose the influence they can exert via personal contact and individual argumentation. Therefore fully automated workflows are not accepted since they would prevent personal interaction [10]. In contrast appliers do ask for flexible eGovernment support which delivers information and structural guidance referring to rules, forms and contact information. Multi-Channel access to services and contact persons as a flexibly selectable option is considered important.

Klischewski and Lenk have already described a continuum ranging from “fully standardised production processes” to “unstructured decision processes” as a criterion to distinguish between types of government services [7]. In order to exactly grasp the nature of B2G processes we divided this criterion further into the three aspects described in this article. The findings show that they apply in different combinations [see 23], thus we are able to differentiate between B2G types more exactly.

**3.2.2 Grade of Routine**

Structure and frequency of a B2G contact can be considered as key aspects for the grade of routine which a specific B2G interaction is handled with.

As far as IT-support for business processes or workflows is concerned we differentiate three types of processes [2]:

- structured processes,
- semi-structured processes and
- unstructured processes.

Structured processes are predictable in their sequence of phases and are conducted with specific cooperation partners on the business as well as on the government side. Business can develop routines and an adapted

organisational structure in order to handle these processes efficiently.

Unstructured processes, in contrast, only provide vague framework conditions and a contact person on the government side. Process steps and organisational working structures have to be developed for each specific case.

Depending on variables like size and industry businesses have to handle specific B2G contacts with different frequencies. For highly frequent B2G contacts businesses often have specialised organisational units or at least specialist who know processes and contact persons. Besides they often have developed specific workflows and an information structure which supports an efficient process handling. B2G contacts which occur only rarely have to be prepared individually each time.

Routine B2G contacts can consequently be described as structured processes which occur frequently. Businesses normally have specialists who handle these processes based on standards, a specific information support and their experience. Regular statistic reports are a good example for routine processes.

Non-routine B2G contacts are less structured and occur only rarely. Those responsible for these contacts have to prepare each as an individual case. The case of a building application as described above can be considered a non-routine contact.

Concerning eGovernment support, routine processes are a typical case for automated or at least semi automated workflows. Very often routine processes are at the same time strictly determined by rules and therefore can be handled with as little manual as possible.

For non-routine processes businesses need information and support for the coordination of the relevant cooperation partners, forms and dates. They also need to be provided with expert knowledge about the legal background and changes which might have been made since the last time they had this case. Automated non-routine processes would hardly be accepted.

From the business point of view the automation of non-routine processes would bear the danger to loose control over these processes.

### 3.2.3 Complexity

The complexity of an eGovernment process depends on the number of participating cooperation partners on the business and on the government side as well as on the length of the process and the number of possible alternatives [15].

Again the building application is a good example for a complex process with a considerable number of cooperation partners and several alternatives depending on the nature of the building.

The complexity of a B2G contact does also influence the requirements towards eGovernment support. For less complex eGovernment processes with a small number of

alternatives and cooperation partners – especially if these cooperation partners stay the same over several iterations of this process – process integration between cooperation partners and workflow support appear quite suitable. One example for such a B2G contact is the disposal of industrial waste. Cooperation partners do not change and there are hardly any alternatives to the standard process.

For highly complex processes with changing actors and several alternatives business need flexible support for their coordination tasks. Workflow support is not suitable since adapting the generic workflow to the current alternative and the current actors would not be efficient.

eGovernment solutions which are provided by public administration often do not integrate third party cooperation partners like certifying agencies or consultants. Businesses, however, consider these cooperation processes as being part of the B2G contact and prefer integrated support solutions.

### 3.3 Phases of B2G contacts

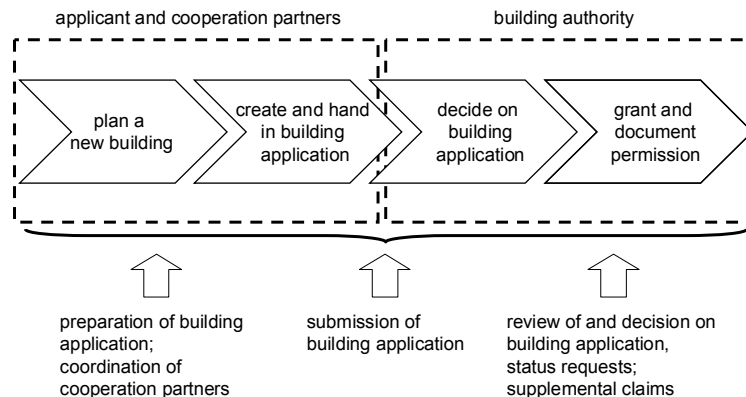
Along the steps of an application process one can differentiate at least three different decision regimes: The preparation and coordination of an application is perceived by businesses as their own decision regime. They can decide which partners they want to share which information with. Very often application processes are paralleled by planning processes for a new building or a new product and thus data and information used in these processes are often confidential.

The submission is dominated by the government agency as far as formal prescriptions and dates are concerned. Applicants, however, decide which information they put into the final version of the application documents and which additional data they want to hand in.

The review of an application is government regime. Application documents are analysed and additional information is requested if necessary. The decision on the application is made and transmitted to the applicant. Status information and requests by the applicant are regulated by government rules.

According to these regimes application processes or B2G processes in general can be divided into three basic phases (see Figure 4):

1. Preparation phase: documents and data are collected and the official forms are filled in – applicant regime.
2. Submission phase: application documents are finalised and submitted according to formal prescriptions to the government agency – mixed regime.
3. Review phase: application documents are reviewed and the decision on the application is made – government regime.



**Figure 4: Characteristic phases of a B2G contact**

Preparation phase:

The preparation of an application is coordinated by the applicant himself or a consultant assigned by the applicant. Information and data necessary for the application is collected and analysed. Frequently, a considerable part of the documents used is confidential and security measures have to be taken in case of cooperating with external partners.

Ambiguous information needs to be commented (e.g. information on irregular emission data which might be caused by measuring errors) in order to avoid negative interpretation on the government side. Guidelines and forms provided by the government authority are used to structure the preparation phase.

eGovernment solutions for this phase should support the cooperation and coordination of actors and tasks. Cooperation partners are often working in different places and in different expert areas. Information needs to be collected from different sources and transformed according to specifications made by the recipients.

In case of complex B2G contacts there are different recipients with different specifications for structure and form of the information to be delivered. Thus data and information have to be transferred into specific application forms and formats, which normally has to be done manually since current eGovernment solutions do not offer any import interfaces.

In the preparation phase applicants develop early versions of the application documents which have an unofficial status and are subject to several revisions by the cooperation partners. After having passed a final quality check the documents are transferred into a final version of the application. In the course of this preparations and revisions the cooperation partners exchange information which is partly confidential and must not be accessible for others even the government agency. Safety measures are therefore important not only against external intrusion but also against government insight.

Businesses prefer to design the structure of the preparation phase in accordance with their internal processes and IT-support.

Applicants in this phase need information on submission dates, formats and forms as well as on process steps, contacts and conditions. This information should be provided according to the actual context. In case of routine processes push information services are considered helpful.

Submission phase:

The submission of application documents needs to be protocolled in a way which is legally binding. All cooperation partners who are handing in documents as well as receiving need to be authenticated and the documents transferred need to be protected against unauthorized access.

Applicants who are handing in documents according to given submission dates need a receipt with a time stamp. For further status tracking the receipt should also contain the case reference.

In many cases electronic documents have to be transferred into a format which can be handled by the government application used to process the decision steps. eGovernment support in the submission phase therefore needs to provide import interfaces and upload mechanisms. Complex application forms should have plausibility checks in order to enhance formal correctness.

Review phase:

After the submission of documents and forms the review phase starts.

Simple types of applications are handled by only one government agency. Complex types are processed cooperatively by several government agencies under the coordination of one leading agency.

There are specific information systems supporting the processing of most of the analysed B2G contacts on the government side. Most of these information systems had been introduced long before public sector IT was called eGovernment. Usually documents and forms handed in by the applicants need to be transferred into the specific information system used for processing the case. Even if there are eGovernment solutions like cooperation platforms for building applications, they are only used for storing and exchanging special documents like plans.

Master data about the applicant and the specific case is still processed in specific information systems.

The review of the application documents starts with a quality check, if formal criteria have been met and if the application documents are complete. This check could partly be done automatically if there was an electronic submission system controlling for completeness and plausibility.

Together with the quality check a new file is created for the case and the case gets a reference. The applicant is told the reference of his case and notified about the result of the quality check (in case something is missing, he is requested to deliver the missing documents).

There are specific milestones in the review phase when the applicant is notified about the status of the process.

Many government agencies try to limit interaction with applicants to this status information in order to concentrate on efficient processing of the case. From the government point of view efficiency, fairness and correctness are the major objectives in the design of the review phase.

Depending on routine grade and pre-coordination businesses like to know about contacts, estimated duration of the process, current status and feedback on the completeness of their application documents.

In case of missing documents the processing time of an application is considerably longer. Therefore applicants want to know about additional requests as soon as possible.

Feature/Phase	Design Requirements	
<u>Grade of routine</u> : individual cases vs. routine cases which occur repeatedly in more or less the same fashion	Routine case	Individual case
	reuse of templates and old versions, workflow support or even automation, interfaces to business software	Simplicity, little learning effort, updates for forms and processes, information about legal basis and process steps, guidelines
<u>complexity</u> : simple cases with a small number of cooperation partners, no (few) process variants vs. complex cases with many different cooperation partners and many process variants	Simple case	Complex case
	Integrated workflow support, interfaces to business software	Context oriented guides and information, documentation of process variants, flexible integration of internal and external cooperation partners
<u>Decision type</u> : automatic information processing vs. decisions with negotiation features	Automatic information processing	Decisions with negotiation features
	Automation, reduction of manual interaction, interfaces to business software	identification of Government contacts, flexible choice of communication channel, personal interaction possible
<u>Preparation phase</u> : collection of information and documents, reuse of old versions, preparation according to forms and dates	Coordination support, supply with forms, formats, interfaces, management of deadlines, plausibility checks, faq-lists, how-to-guides, contacts (multi channel access)	
<u>submission phase</u> : submission of final version of documents and forms, receipt with case reference	Legally binding documentation of submission, authentication, protection against unauthorized access, receipt with time stamp and case reference, conversion of documents in special formats if necessary	
<u>review phase</u> : coordination of review process, collection review results, documentation of decision result, archiving	interface to specific case management software, multi channel communication with applicant for status reports, requests for additional information	

**Table 2: Design Requirements for Features and Phases**

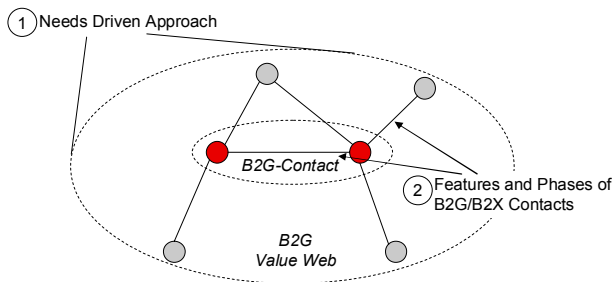
#### 4. Design for B2G Value Webs

The following section introduces an approach for the systematic elicitation of design requirements for B2G value webs based on the features and phases of B2G contacts and on a domain analysis method called needs driven approach. After a short summary of the needs driven approach in 4.1, section 4.2 describes how the needs driven approach and the features and phase work together for eGovernment requirements elicitation.

Inter-organizational processes pose specific challenges and requirements for business process design [9]:

- Representation of inter-organizational processes
- Allocation of tasks to actors
- Alignment of semantics
- Decoupling of internal and external processes
- Selective visibility of internal processes to external partners
- Support of alignment with multiple partners.

Most of these apply also to B2G contacts as the description of characteristic features and phases has shown.



**Figure 5: Design Approach for B2G Value Webs**

Domain analysis therefore appears to be a good approach to collect information on processes, tasks, responsibilities and requirements from different perspectives and put them together to form an integrated picture.

B2G value webs can be seen as a specific domain which is characterized by a specific set of actors working together in a specific set of cooperation processes. Only if there is an understanding of the support requirements of all relevant actors in a B2G value web, the resulting eGovernment design can meet all actors' needs.

In order to grasp the B2G value web around a core B2G contact we propose a domain analysis according to the Needs Driven Approach.

The features and phases of B2G contacts are then used to describe the different B2G processes within the B2G value web (see Figure 5).

In the following section we describe the Needs Driven Approach (nda) as a type of domain analysis. Afterwards the requirements assessment for B2G value webs is introduced.

#### 4.1 Needs Driven Approach

The NDA was initially developed by Schwabe and Krcmar as a modus operandi for structuring computer supported cooperation [17], but experience indicates a more general field the method can be applied to. With its scientific roots in the theory of structure [see4], object oriented analysis and ethnography, the approach is based on several fundamental concepts: work orientation, analyzing and structuring group work, focus on human technology interaction, capturing the whole work environment for problem analysis, cooperative analysis and design.

The NDA is organized in eight analysis dimensions, each of which describes and discusses one aspect or view of the target domain:

The 'task' perspective analyzes input and output requirements as well as guidelines around working tasks. Very often there are rules referring to processes, tools and materials to be used or people to be integrated. These rules are elicited by the task perspective.

The analysis of 'work processes' focuses on process steps on the individual as well as on the group level. Which tasks are done parallelly and which tasks sequentially? Which tools are used?

Interaction between individuals and groups mainly in terms of work or task dependent communication is observed in the 'interaction' perspective,

whereas work independent communication between individuals and groups is analyzed under the heading 'social cooperation structures'.

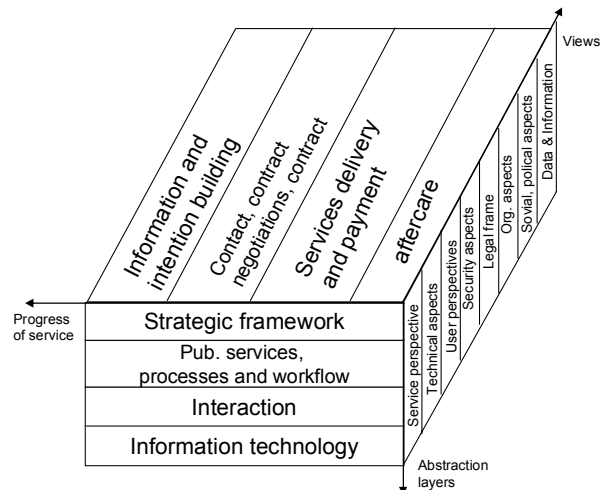
The tools analysis is one of the most important analyses. It is important to identify all the materials and tools, which are used during the observed process.

The way how actors learn to use new tools to support their tasks and the interaction between tools and work processes is analyzed in the 'adoption' view.

The 'information memory' perspective looks at information archives. Which information is stored in which kind of archive? Archives can not only be electronic memory systems but also libraries, paper based files or even individuals' minds.

The final nda perspective focuses on the physical work place and how tools and other elements are arranged.

Each of these analyses can be applied either on its own or in conjunction with other views, since the individual results are composed in order to achieve a thorough model of the domain.



**Figure 6: Holistic Reference Framework by Wimmer [21]**

The industry unspecific NDA analysis dimensions can be mapped on the holistic framework for the development of eGovernment systems proposed by Wimmer [21, 22]. The framework has a more detailed architecture consisting of multiple views, abstraction layers and progress phases. The open NDA approach provides a lightweight field research instrument, the differentiated structure of the framework can however be used to guide the analysis of the collected domain material.

#### 4.2 Requirements Assessment for B2G Value Webs

The following section deals with the proposed model for the requirements assessment for B2G value webs. After a short introduction to the model as a whole, the two

elements for analyzing the B2G domain as well as individual B2G contacts in the domain are described.

As indicated above we propose a two-step approach for the requirements assessment for B2G value webs (see Figure 5):

1. Identification of tasks, actors and processes in a B2G value web using the needs driven approach. This steps aims at grasping as much of the value web as possible.
2. Analyzing processes and interaction in the value web referring to features and phases in order to describe detailed design requirements.

The analysis of a B2G value web starts with the identification of an individual B2G contact which is considered to be accompanied by at least one further B2x contact either to another government agency, to an intermediary or to a third party cooperation partner. As a first analysis step the known cooperation partners are to be identified, i.e. the organisational unit in a company responsible for this B2G contact and the government agency. Based on interviews and document analyses the following NDA dimensions are used in order to gather information on the surrounding B2G value web (see table 3):

NDA analysis dimension	analysis targets	methods/results
Task	<ul style="list-style-type: none"> <li>- legal constraints and prescriptions → which applications are necessary, which areas are subject to government control</li> <li>- which other tasks are caused by these legal prescriptions?</li> <li>- who is involved to perform these tasks – brought in by the company, brought in by the government agency?</li> </ul>	<ul style="list-style-type: none"> <li>- emp. method: Observation, document analysis, semi-structured interviews</li> <li>- results: textual task descriptions referring to actors, rules and constraints</li> <li>- Findings are documented as annotations/ extensions for process diagrams → work process dimension</li> </ul>
Work processes	<ul style="list-style-type: none"> <li>- which processes are there with which cooperation partners?</li> <li>- Which causal links and interdependencies are there?</li> </ul>	<ul style="list-style-type: none"> <li>- emp. method: Business process analysis</li> <li>- results: textual and graphical process description → event driven process chains or other description languages; extensions are made in order to illustrate inter-organisational interaction [9]</li> </ul>
interaction	<ul style="list-style-type: none"> <li>- which communication channels are used for which kind of communication?</li> <li>- which cooperation partners communicate with each other, how often?</li> <li>- Which connections to which processes can be identified?</li> </ul>	<ul style="list-style-type: none"> <li>- emp. method: Business process analysis, interaction analysis</li> <li>- results: textual and graphical interaction description → annotated interaction diagrams</li> </ul>
tools	<ul style="list-style-type: none"> <li>- which tools are used on the business side?</li> <li>- which tools are used on the government side?</li> <li>- which tools are used together by which cooperation partners?</li> </ul>	<ul style="list-style-type: none"> <li>- emp. method: Business process analysis</li> <li>- results: textual description of tools used</li> <li>- findings are documented as annotations/ extensions for process diagrams → work process dimension</li> </ul>
Information memory	<ul style="list-style-type: none"> <li>- Where do actors get/store information on Formats, forms, dates, procedures, laws, contacts?</li> <li>- Content of applications and reports</li> </ul>	<ul style="list-style-type: none"> <li>- emp. method: Business process analysis, system analysis</li> <li>- results: textual descriptions of information sources</li> <li>- findings are documented as annotations/ extensions for process diagrams → work process dimension</li> </ul>

**Table 3: NDA Analysis Dimensions for B2G Value Webs**

The dimensions social cooperation, adoption and work place are considered less important for the description of a B2G value web. Social cooperation is also included to some extend into the features analysis; adoption and work place are focusing on aspects of individual companies or

government agencies which are not relevant for the general classification of B2G value webs.

The NDA should give an overview over the actors and B2x contacts in a B2G value web. After having identified



actors and processes, features and phases of individual B2G/ B2x contacts are focused on.

The NDA analysis gives hints on connections and causal links between B2G/B2X contacts which are analysed in more detail according to the features and phases model.

Features/ phases	analysis targets
Grade of routine	<ul style="list-style-type: none"> <li>- how frequently is this B2x contact performed?</li> <li>- to what extend is there a repeated pattern of the B2x contact?</li> <li>- how many variations are there?</li> <li>- what is the difference between variations?</li> <li>- is there a standard process for the B2G contact?</li> </ul>
Decision type	<ul style="list-style-type: none"> <li>- do you need advice by the government agency to perform the B2G contact?</li> <li>- is there room for interpretation on the government side?</li> <li>- is there a 'real' decision or is it a matter of complete documents?</li> <li>- is the decision a standard case and if all documents and data are delivered, the permission is granted?</li> <li>- how many parties are involved on the government side?</li> </ul>
complexity	<ul style="list-style-type: none"> <li>- how many variations of this B2x contact are there?</li> <li>- how many factors are to be observed to decide which variation is applicable?</li> <li>- how many cooperation partners are involved (on the government side, on the business side)? Do they change each time the B2G contact is performed?</li> <li>- are there connections to other B2x contacts? To how many?</li> <li>- how much effort is necessary for this B2X contact?</li> </ul>
Phases	<ul style="list-style-type: none"> <li>- which phases can be distinguished?</li> <li>- which partners are involved in theses phases?</li> <li>- which extend of security measures is necessary in these phases?</li> <li>- which phases are governed by whom?</li> </ul>

**Table 4: Features and Phases analysis for B2G contacts**

**5. Outlook**

The concept for needs driven design for eGovernment value webs proposed in this article is currently being piloted in a research project on B2G contacts on the German national level. Several B2G contacts with government agencies on the national level have been chosen for analysis since they are considered being accompanied by other B2x contacts to government agencies or to third party cooperation partners. One example for such a B2G contact is the approval of a new product which is done by a national agency. Depending on the industry new products are also certified by several other agencies in order to get environmental or safety labels, and patents and brand rights are secured. These processes are normally accompanied by experts like consultants or lawyers who support businesses at preparing documents and forms for the B2G contact.

Working with the needs driven design for eGovernment value webs shows several obstacles we will have to improve in future:

- The identification of organisational units and contacts in businesses responsible for a certain B2G contact turns out to be rather difficult since businesses usually do not have an overview over their government contacts. Industry associations start to work on eGovernment programs for their members. They might be an interesting source of knowledge on industry specific issues and organisation of B2G contacts in companies.
- The model of features and phases might not be sufficiently detailed – the analysis of further B2G contacts will show if there are more features and phases to be distinguished.
- Business specific characteristics like industry and size of a company have not been incorporated in the model so far. Besides the fact that some industries have certain B2G contacts more often than others, these characteristics might also be important for the description of a B2G contact and the derivation of requirements.

In spite of these deficiencies the needs driven design for eGovernment value webs appears to be a suitable approach for requirements elicitation especially from the business perspective. Businesses themselves reported that they wanted to analyse their government contacts according to the features and phases model in order to transfer efficient structures and processes to other contacts of the same type.

Referring to design consequences of the needs driven analysis we expect to find patterns and types of B2G interactions which are representatives for groups of similar processes. eGovernment solutions can then be designed for classes of B2G contacts. Expenses in cost

and time could be drastically reduced as well as the heterogeneity of solutions for identical processes.

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