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Benchmarking study on municipal portals: A Survey of G2B-Services in the U.S.

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Abstract: As public administrations are increasingly transforming towards customer-oriented service providers, the availability of municipal E-Services increases. Particularly, E-Services addressed to Small and Medium Sized Enterprises (SMEs) representing 90 % of all enterprises in the U.S. are of interest. While generic surveys on E-Government portals are conducted manifold, surveys dedicated to G2B E-Services are neglected. Thus, the paper presents the status quo by illustrating the results of a benchmarking survey. The survey analyzes the offer of G2B E-Services in 50 U.S. large and capital cities. Furthermore, the identified criteria for the survey provide a basis for a maturity model. The study is accomplished according to the "Procedural model for the Benchmarking of Service" – DIN PAS 1014 and is conducted with the "Mystery User" approach. The findings of the survey address academic research as well as administration practice in the context of E-Government.

1 Introduction

Public administrations are transforming towards customer-oriented service providers. As their target group, businesses are increasingly focused [HKN08]. Especially in the field of public services offered by cities and municipalities, E-Services are increasingly available.

Particularly for SMEs available G2B E-Services covering essential requirements (e.g. forms services, essential business information) are of interest. As SMEs have to compete with restricted resources [SC07], slight administrative processes are of interest.

Up to the time of executing this survey, the status quo of the implementation of municipal Government-to-Business (G2B) E-Services in the U.S. has not yet been analyzed. This report is bridging this gap by giving a structured overview to G2B E-Services offered by 50 U.S. large and capital cities. The survey is conducted by the following working hypothesis:

1. Search functionalities in E-Government web portals and their clear arrangement are minimum requirements, that are widely achieved

2. The naming of a central contact person for business in the communal portals and the establishment of central service hotlines to permanent accessibility of the public administration are not yet achieved

3. G2B E-Services are limited to core services (e.g. registration of a business, construction permit). Advanced services (e.g. meta-services for forms, geographic information systems [GIS] data) are not yet extensively offered.

4. As municipal E-Services portals can be classified by maturity levels, we assume that the maturity of the portals is still low.

5. The maturity levels are positive correlated with the positioning of the cities. According to this, the portal of a higher positioned city features a higher maturity level than a lower positioned city.

This report is structured as follows: First we sum up benchmarking approaches in E-Government. Additionally, we give an overview of existing studies concerning benchmarking E-Government (Section 2). Then we give a detailed description of our methodological approach and research design (Section 3). Subsequently, the results of our research are presented and discussed (Section 4). The report closes with a summary and a discussion of further research questions.

2 Background and State-of-the-Art in research

2.1 Benchmarking E-Government

The Gartner group defines E-Government as "the continuous optimization of service delivery, constituency participation, and governance by transforming internal and external relationships through technology, the Internet and new media." More definitions are presented by [PS07] and [YS07]. The field of E-Government is divided in the following four fields [Sc04]:

- E-Public Services
- E-Democracy, E-Participation
- E-Organisation
- E-Production Networks

Alternatively, the application field of E-Government can be distinguished by the recipient of the public services. Thus, businesses, citizens and governments are identified as stakeholders for public services [GE03].

To analyze the municipal portals for G2B E-Services, the benchmarking method is applied. Benchmarking methods are belonging to the so called accompanying evaluation methods. Accompanying evaluation methods analyze continuously objectives and effects of activities. Moreover they give feedback in decision and execution processes [Sc04]. There exists a widely common definition of benchmarking in scientific literature [Ca94]. In the context of E-Government we follow the benchmarking definition of [He06]: „eGovernment benchmarking means undertaking a review of comparative performance of e-government between nations or agencies“.

Benchmarking approaches can be specified with respect to the dimensions "perspective" and "object of comparison". Thus, the dimension "perspective" in mind, we can differentiate between a retrospective quantitative view and a prospective qualitative view. Regarding to the "object of comparison", there exist internal and external views. An internal benchmarking study focuses on comparison of organisational units inside of an administration. However, an external benchmarking study can be accomplished horizontally (comparison of administrations belonging to the same national layer), vertically (comparison of administrations belonging to different national layers) or intra-sectoral (comparison of organisations belonging to different sectors) [He06]. For benchmarking government, the object of comparison is the relevant starting point in public administrations [GS00].

At this, the comparison between administrations towards their offered services is the main intended use of benchmarking studies in the public sector [TW96]. In summary, our study is a qualitative approach focusing E-Public Services for businesses. As our focus is on the analysis of administrations in U.S. large and capital cities, the comparison is accomplished externally on a horizontally layer. Due to similar processes and products in the public administration area, a high comparableness is set.

2.2 Related studies

In the field of benchmarking e-Government services, there exist several international studies focusing different aspects of E-Government. Table 1 gives a structured overview.

Year	Title	Organisation/Author	Thematic focus	Reference field (geogr.)	G2B
2007	Eight U.S. E-Government Study	Brown University [Br07]	US-wide comparison of federal sites and survey of citizens	National (US)	no
2006	Europe-wide increasing availability of public e-Services (in German)	Capgemini [Ca06]	Europe-wide comparison of e-Services, 20 services as benchmarking criteria, analysis towards service categories and maturity levels	Inter-national (Europe)	yes
2003	Benchmarking E-Government in Europe and the US	Graafland-Essers, Ettedgui [GE03]	User Survey	Inter-/ National (Europe)	yes
2001	Benchmarking E-Government: A Global Perspective – Assessing the Progress of the UN Member States	United Nations Division for Public Economics and Public Administration; American Society for Public Administration [UN01]	Global E-Government map focusing on approach, progress and application of E-Government in 190 UN member states to evaluate general conditions for E-Government. To do so, 2 methods are applied: a website survey and a statistical analysis of given ICT-infrastructures as well as human resources (final measure:" E-Government Index")	Inter-national (global)	no

Table 1: Benchmarking studies on E-Government

Moreover, SCHUSTER [Sc03] overviews national and international surveys and studies on municipal services. At present, an U.S.-wide comparative study on the implementation of G2B E-Services does not exist. The study presented in this paper aims at bridging this gap.

3 Methodological approach

3.1. Procedural Model for Benchmarking services

The benchmarking study is accomplished methodologically according to the "Procedural model for the Benchmarking of Service" – DIN PAS 1014 [DIN01]. According to this, a benchmarking study is divided into four phases:

1. Conceptual design and planning phase (Creation of a formal frame for the study)

2. Survey phase (Review and schematic description of the observations using a scoring model and a list of criteria)

3. Analysis phase (Calculation of individual results, creation of graphic charts and deduction of significant results)

4. Realisation phase (Realisation of required improvements).

The accomplishment of the benchmarking study follows two methods of "Third-party Web Assessment" [He06], whereas the approach "mystery user" is applied in a first step. The principle of the "mystery user" approach indicates that an examiner puts itself in the role of a client that is demanding the municipal services. This approach is also named as "mystery shopping" [Wi98]. In the present case, the „mystery user" approach is qualified to accomplish the survey, as the case of a competition-oriented benchmarking study is [Bö99; St97]. Therefore, objectivity and realism are ensured. In a second step, another approach belonging to the "Third-Party Web Assessment" is applied: we use the "categorisation" according to HEEKS to, first, analyze presence and absence of defined services and web portal characteristics, and, second to do a classification according to a stage model rating [He06].

3.2 Scoring model for rating the results

Our criteria catalogue consists widely of qualitative criteria. In the academic discourse, the problem of an adequate quantification of qualitative criteria is widely discussed. However, the importance of qualitative criteria in moments of decision-making is beyond dispute. In the present case, the use of a scoring model is appropriate to rate the differences by the specifications of criteria [Wi07; WKW95]. By default, a scoring model consists of the following phases [Wi07]:

1. Determination of the rating criteria

2. Weighting of the criteria

3. Description of the characteristics of alternatives

4. Rating of the characteristics of alternatives

5. Calculation of weighted points of an alternative

6. Accumulation of weighted points per alternative

A widely known problem is the choice of criteria and the determination of weights, as subjectivity is hard to handle [Wi07; WKW95]. Our scoring approach follows the six steps described above.

3.2.1 Determination of the rating criteria

The study was accomplished analysing 25 criteria divided in 5 categories:

- Category 1: Search functionalities for G2B E-Services
- Category 2: Clarity of E-Services offered to businesses (overall view)

- Category 3: Contact partner services for businesses
- Category 4: Form services for businesses
- Category 5: Municipal G2B E-Services

The choice of criteria is based on results of expert interviews as well as businesses interviews. Table 2 gives a detailed overview.

no.	criteria	measurement units	weighting coefficient

Category 1: Search functionalities for G2B E-Services

no.	criteria	measurement units	weighting coefficient
1.	Does an official web portal for the considered city exist?	presence / specification	1
2.	Do link functionalities to a dedicated website for economy or businesses with bundled G2B E-Services exist?	presence / specification	1
3.	Does the entry of search terms "economy" and / or "businesses" into the input field "search" lead to G2B E-Services?	presence / specification	1
4.	Search path from the main portal to the overview of G2B E-Services on the business portal.	Quantity	1

Category 2: Clarity of E-Services offered to businesses (overall view)

no.	criteria	measurement units	weighting coefficient
5.	Does a dedicated web portal for economy or businesses exist?	presence / specification	2
6.	Is location information for businesses available?	presence / specification	1
7.	Are there photos (optical impressions by static pictures from the location) available?	presence / specification	1
8.	Are there video clips (optical impressions by dynamic pictures from the location) available?	presence / specification	1
9.	Is a geographic information system (GIS) available (web.gis-applications)?	presence / specification	2
10.	Is a forum (e.g. idea box, suggestion box, complaint box) available?	presence / specification	2

11.	Is a feedback possibility available?	presence / specification	2
12.	Is the portal available multilingual (the portal is available at least in 1 foreign language).	complexity level	3

Category 3: Contact partner services for businesses

13.	Is a central hotline for businesses to contact the administration available?	presence / specification	1
14.	Are central contact partner for businesses named?	presence / specification	2
15.	Are visible service guarantees for initial responses by the administration available?	time value	2

Category 4: Form services for businesses

16.	Are business-oriented form download services available?	presence / specification	2
17.	Are help functions for forms and procedures (e.g. completion support, check lists) available?	presence / specification	2
18.	Is digital signature for authentication embedded in the form management?	presence / specification	3
19.	Is application processing per form directly online available?	presence / specification	3
20.	Are the form services connected to external bodies? (e.g. country administration, state administration).	presence / specification	2

Category 5: Municipal G2B E-Services

21.	Industrial real estate and commercial property - in which complexity level available on the business portal?	complexity level	3
22.	Services for founders of new businesses - in which complexity level available on the business portal?	complexity level	3

23.	Registration of a business - in which complexity level available on the business portal?	complexity level	3
24.	E-Tendering / E-placing - in which complexity level available on the business portal?	complexity level	3
25.	Other municipal business-oriented services - in which complexity level available on the business portal?	complexity level	3

Table 2: Criteria Catalogue for G2B E-Services

As Category 5 consists of municipal G2B E-services, we give a short description of the particular services:

- Industrial real estate and commercial property: Industrial real estates and commercial properties comprise estates and buildings (including equipment) for commercial use. According to this, departments for communal business development provide municipal offers and information services for businesses.

- Services for founders of new businesses: Founding of new business means the realisation of self-employment. The founding of a new business starts with the entry in business operations and due to formal legal reasons with the registration of a business. Services for founders comprise: consulting, support programs, official registrations etc.

- Registration of a business: The registration of a business means the official registration of self-employment at the responsible authority.

- E-Tendering / E-placing: Public tendering is part of the procedure to allocate assignments. Hence, potential tenderers are invited to submit offers. These procedures are usually strongly standardised by legal frameworks.

3.2.2 Weighting of the criteria

As the analyzed criteria do have different dimensions of importance, the point values are weighted according to their economic importance for businesses with the weighting coefficients 1 to 3:

Coefficient 1: the economic importance of an E-Service for businesses is fundamental

Coefficient 2: the economic importance of an E-Service for businesses is particular fundamental

Coefficient 3: the economic importance of an E-Service for businesses is outstanding fundamental

The differentiation of the coefficients results from expert interviews as well as from interviews with businesses. So, a two-way interaction with clients has more economic valuable for a business than presented information. The weighting coefficients per criterion are added in Table 2.

3.2.3 Description of the characteristics of alternatives

The description of the characteristics of alternatives results from experts interviews. As mentioned before, a rest of subjectivity is unavoidable. Nevertheless our differentiating factors are defined in inter-subjective revisable way. Table 3 shows the criteria and the corresponding differentiating factors.

no.	criteria	differentiating factors
1.	Does an official web portal for the considered city exist?	An official web portal for the city does exist An official web portal for the city does not exist
2.	Do link functionalities to a dedicated website for economy or businesses with bundled G2B E-Services exist?	There exists at least 1 link to a dedicated website for economy or businesses with bundled G2B E-Services There exists no link to a dedicated website for economy or businesses with bundled G2B E-Services
3.	Does the entry of search terms "economy" and / or "businesses" into the input field "search" lead to G2B E-Services?	Search terms "economy" and "businesses" are successful Search terms "economy" or "businesses" are successful Search terms are not successful
4.	Search path from the main portal to the overview of G2B E-Services on the business portal.	1 click 2 clicks >2 clicks
5.	Does a dedicated web portal for economy or businesses exist?	There exists at least 1 dedicated website for economy or businesses with bundled G2B E-Services There exists no dedicated website for economy or businesses with bundled G2B E-Services
6.	Is location information for businesses available?	Location information for businesses is bundled available on the business portal otherwise: Location information for businesses is available otherwise
7.	Are there photos (optical impressions by static pictures from the location)	> 3 photos per page on 5 pages on the business portal available

	available?	3 photos per page on 5 pages on the business portal available
		< 3 photos per page on 5 pages on the business portal available
8.	Are there video clips (optical impressions by dynamic pictures from the location) available?	> 1 video clip on the business portal available
		1 video clip on the business portal available
		otherwise
9.	Is a geographic information system (GIS) available? (web.gis – applications).	> 3 indicator categories on the business portal
		city map with 3 indicator categories on the business portal
		< 3 indicator categories on the business portal
10.	Is a forum (e.g. idea box, suggestion box, complaint box) available?	criterion fully available
		functionalities of the criterion are partly available
		criterion not available
11.	Is a feedback possibility available?	criterion fully available
		functionalities of the criterion are partly available
		criterion not available
12.	Is the portal available multilingual (the portal is available at least in 1 foreign language)?	complexity level 0: no E-Services
		complexity level 1: Information
		complexity level 2: Download of files
		complexity level 3: Interaction (editing of forms und authentication)
		complexity level 4: Tracking
		complexity level 5: Transaction (complete online processing - admissions and payment included)
13.	Is a central hotline for businesses to contact the administration available?	hotline is available after 6 p.m. and/or during the weekend
		term "hotline" and a phone number are available on the business portal
		otherwise
14.	Are central contact partner for businesses named?	Central contact partner with visible coordination competence are named on the business portal

		Central contact partner without visible coordination competence are named on the business portal
		Otherwise
15.	Are visible service guarantees for initial responses by the administration available?	response time - visible service guarantee - in less than 2 working days
		otherwise: response time - visible service guarantee - within 2 working days
		otherwise
16.	Are business-oriented form download services available?	Business-oriented form download services are available bundled on the business portal
		Business-oriented form download services are available
		Otherwise
17.	Are help functions for forms and procedures (e.g. completion support, check lists) available?	Help functions for forms and procedures are available bundled on the business portal
		help functions are available for business-oriented forms
		otherwise
18.	Is digital signature for authentication embedded in the form management?	criterion fully available (authentication and application is possible fully online)
		authentication and application is possible partly online
		criterion not available
19.	Is application processing per form directly online available?	Data Entries of businesses can directly processed on the business portal in >1 procedure
		otherwise: Data Entries of businesses can directly processed on the business portal in 1 procedure
		otherwise
20.	Are the form services connected to external bodies? (e.g. country administration, state administration)?	Links to external bodies for businesses are available bundled on the business portal
		Links to external bodies for businesses are available
		Otherwise
21.	Industrial real estate and commercial property - in which complexity level available on the business portal?	complexity level 0: no E-Services
		complexity level 1: Information

		complexity level 2: Download of files
		complexity level 3: Interaction (editing of forms und authentication)
		complexity level 4: Tracking
		complexity level 5: Transaction (complete online processing - admissions and payment included)
22.	Services for founders of new businesses - in which complexity level available on the business portal?	complexity level 0: no E-Services
		complexity level 1: Information
		complexity level 2: Download of files
		complexity level 3: Interaction (editing of forms und authentication)
		complexity level 4: Tracking
		complexity level 5: Transaction (complete online processing - admissions and payment included)
23.	Registration of a business - in which complexity level available on the business portal?	complexity level 0: no E-Services
		complexity level 1: Information
		complexity level 2: Download of files
		complexity level 3: Interaction (editing of forms und authentication)
		complexity level 4: Tracking
		complexity level 5: Transaction (complete online processing - admissions and payment included)
24.	E-Tendering / E-placing - in which complexity level available on the business portal?	complexity level 0: no E-Services
		complexity level 1: Information
		complexity level 2: Download of files
		complexity level 3: Interaction (editing of forms und authentication)
		complexity level 4: Tracking
		complexity level 5: Transaction (complete online processing - admissions and payment included)
25.	Other municipal business-oriented services - in which complexity level available on the business portal?	complexity level 0: no E-Services
		complexity level 1: Information

|		complexity level 2: Download of files
		complexity level 3: Interaction (editing of forms und authentication)
		complexity level 4: Tracking
		complexity level 5: Transaction (complete online processing - admissions and payment included)

Table 3: Differentiating factors for the criteria catalogue

3.2.4 Rating of the characteristics of alternatives

As the different criteria have different types of characteristics, varied measurement indicators have to be applied. The different criteria were rated according to the following indicators:

- Time Value: Days until a defined service is reached or fulfilled

- Quantity: number of clicks until a defined service is reached

- Presence / specification: considering the concrete criterion, the rating is according to the following two schemata:
  (A) no presence/no fulfilling = 0 points;   presence/ fulfilling = 1 point and
  (B) no presence/no fulfilling = 0 points; partial fulfilling = 1 point; complete fulfilling = 2 points.

- Complexity Levels: Degree of implementation of a service reaching from 0 (no E-Services) to 5 (Transaction)

Selected criteria are rated according to complexity levels [BM00; FIS03] whereas the following specifications are possible:

Complexity Level 0:   no *E-Services* (for a certain service available)

Complexity Level 1:   *Information* (on a certain service is available online)

Complexity Level 2:   *Interaction* (download of files is available)

Complexity Level 3:   *two-way interaction* (editing of forms and authentication is available)

Complexity Level 4:   *online-tracking* (presentation of current time perspective and status of the proceedings or open steps until a process is completed)

Complexity Level 5:   *Transaction* (complete online processing – admissions and payment included)

The measurements point for the complexity levels were given according to the complexity level that means e.g. a service in complexity level 4 is calculated with 4 points for the considered city.

3.2.5 Calculation and accumulation of weighted points per alternative

The determined points were transferred in an evaluation matrix. Hence, after rating and weighting the criteria, the total of points for each city can be calculated. With respect to the space of time of the study, the city with the highest total of points has the best online portal concerning quantity and quality of G2B E-Services.

3.3 Maturity Model approach

3.3.1 Background

Maturity models are known approaches to describe the characteristics of organisations (mostly businesses) in different evolution levels [Wi07]. At this, the maturity of processes or maturity of capability is focused. FRASER ET AL. give an overview on existing maturity model approaches for different application domains [FGM02]. A widely accepted maturity model is the so called Business Process Maturity Model [NN08a]. Usually, a maturity model consists of 5 levels, whereas the highest level represents "Good Practice" respectively "Best Practice" [FGM02]. The lower levels characterise organisations in interim states. That means these processes or capabilities do have improvement potentials. Businesses apply maturity models rather to identify improvement potentials than to a power measurement [Wi07]. For the field of E-Government, a special maturity model has been developed [NN08b].
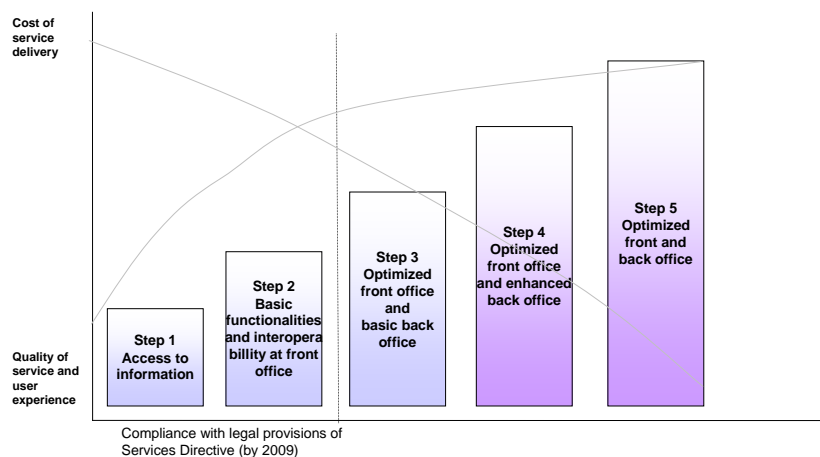

Figure 1: Maturity Model for E-Government (source [NN08b])

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This model focuses explicit the requirements of the Directive on services in the internal market also named as EU Services Directive [EU06]. The EU Services Directory in mind, municipalities of all EU Member States have to intensify their offer of E-Services. First and foremost, formalities as well as procedures to start up and exercise a business must be reachable by electronic means and "from a distance". The accessibility of individuals, data, programs and objects via internet requires target-oriented and efficient transactions of public administration procedures. Hence, aspects as optimisation of administrative processes, cost savings for the demanding business and bureaucracy dismantling are challenges for E-Government resulting from these requirements. Having regard to the EU Services Directive, the research discipline "information systems" meets a challenge: Starting with conceptions of integrated product-process-models for E-Government offerings over process optimization in municipal administration, to assistance of IT-based implementation of the requirement that demands the EU Services Directive.

Steps 1 and 2 have to be technologically implemented by the end of 2009. The model shown in Figure 1 consists of 5 maturity levels [NN08b]:

- *Step 1:* focuses article 7.3 of the Directive. According to this, Member States have to ensure access to information by electronic means,

- *Step 2:* focuses article 8.1 of the Directive. So, businesses should be able to handle all procedures and formalities by electronic means,

- *Step 3:* focuses aspects beyond the legal requirements of the Directive. Goal is here an optimized front office and a basically structured back office (e.g. implementation of a service-oriented architecture [SOA] for a substantial customer relationship management),

- *Step 4:* focuses on an improved back office (e.g. introduction of an electronic registry for authorities),

- *Step 5:* focuses on reaching an optimized front office as well as optimized back office (e.g. using semantic technologies and performance management tools to monitor processes).

3.3.2 Adapted maturity model

For showing the maturity levels of the G2B portals, we adapted the generic model presented in chapter 3.3.1 as follows. As the complexity levels of services represent a consequential analogy to the maturity model, we first extended the model with level/step 0. Then, we decided that according to our evaluation method "third party web assessment", only the levels 0 to 3 can be rated (cp. Figure 2).

15
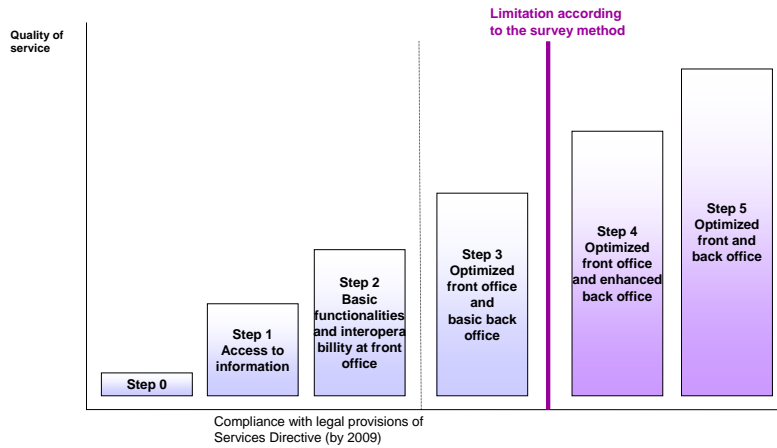
Figure 2: Adapted Maturity Model

According to WILKE we allocated our criteria to the different levels to determine the levels by certain characteristics. The levels are determined as follows (cp. Figure 3):

Figure 3: Maturity level determination

For a classification according to Maturity Level 1, a portal has to fulfil 80 % of the basic criteria (criteria 1, 3, 6, 14) and of the criteria 12 as well as 21-25 in complexity Level 1. For a classification according to Maturity Level 2, a portal has to fulfil 80 % of the basic criteria (criteria 5, 10, 13, 16) and of the criteria 12 as well as 21-25 in complexity Level 2 or 3. To reach Maturity Level 3, a portal has to fulfil (besides the criteria for Level 1 and 2) 33% (as these requirements go further than the EU Service Directive) of the criteria 2, 4, 7, 8, 9, 11, 15, 17, 18, 19, 20 and of the criteria 12 as well as 21-25 in complexity level 4 or 5. According to this classification, a rating for the cities can be accomplished.

4 Results of the study

4.1 Structure of the sample and data evaluation

The research and analysis method described above was applied to 50 large (> 100.000 inhabitants) and capital U.S. cities in January 2009.

UN- Yearbook 2006: Population of capital cities and cities of 100 000 and more inhabitants: latest available year, 1987 - 2006	
United States	
US Cities:	
New York (NY)	Louisville (KY)
Los Angeles (CA)	Washington (DC)
Chicago (IL)	Nashville-Davidson (TN)
Houston (TX)	Las Vegas (NV)
Philadelphia (PA)	Portland (OR)
Phoenix (AZ)	Oklahoma City (OK)
San Antonio (TX)	Tucson (AZ)
San Diego (CA)	Albuquerque (NM)
Dallas (TX)	Long Beach (CA)
San Jose (CA)	Atlanta (GA)
Detroit (MI)	Fresno (CA)
Indianapolis (IN)	Sacramento (CA)
Jacksonville (FL)	New Orleans (LA)
San Francisco (CA)	Cleveland (OH)
Columbus (OH)	Kansas City (MO)
Austin (TX)	Mesa (AZ)
Memphis (TN)	Virginia Beach (VA)
Baltimore (MD)	Omaha (NE)
Fort Worth (TX)	Oakland (CA)
Charlotte (NC)	Miami (FL)
El Paso (TX)	Tulsa (OK)
Milwaukee (WI)	Honolulu (HI)
Seattle (WA)	Minneapolis (MN)
Boston (MA)	Colorado Springs (CO)
Denver (CO)	Arlington (TX)

Table 4: U.S. large and capital cities

Starting point for each analysis was the main portal of a municipality, visited via {name of city}.countrycode (main page). On the basis of the criteria catalogue, free accessible city portals were analyzed.

According to the principles of the "third party web assessment" method, no contact with the municipalities by telephone or by mail has been established. No coordination or call-back was done to guarantee objectivity. According to this, only these portal offers were considered, that were externally free accessible and hence usable for the target group businesses.

4.2 Presentation and discussion of the results

In the following sections, we give a detailed overview on the achieved results.

4.2.1 Category 1: Search functionalities for G2B E-Services

In the first category, we state, that only one city does not have an official web portal (criterion 1). Considering criterion 2 (link functionalities) 92 % of the portals do completely fulfil this criterion. Also criterion 3 and criterion 4 are widely fulfilled by the portals (84 % in both cases).

4.2.2 Category 2: Clarity of E-Services offered to businesses (overall view)

In this category, we can assume, that 94 % of the cities offer a dedicated web portal for G2B E-Services as shown in figure 4.
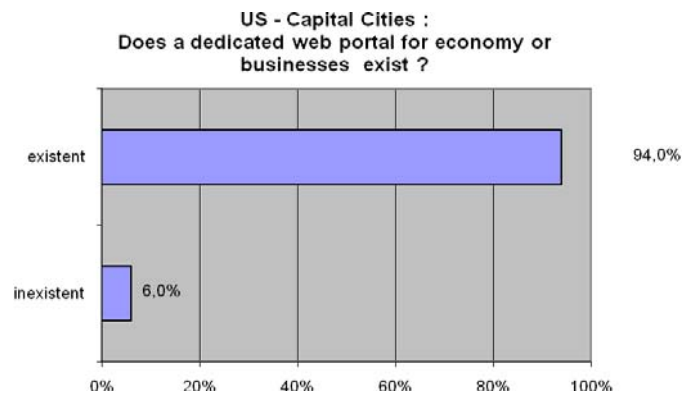

Figure 4: Existence of dedicated web portals for businesses

The lack of existence of a dedicated web portal results in uncomfortable navigation through the portals. Fully location information services are provided by nearly three-fourths of the cities (72 %).

However, multimedia services (criterion 7 and 8) are not widely provided (96 % of the cities do not provide photos and 92 % of the cities do not provide video clips). Additionally, the results for GIS-Services (geographic information systems) show particularly results: either a municipality offers full GIS-services (22 %) or no GIS services at all (78 %). 54 % of the portals give their costumers the possibility to leave comments in a forum, and 44 % offer (also) other feedback instruments.

4.2.3 Category 3: Contact partner services for businesses

In this category, we can assume that 66 % of the portals offer a partly or full service concerning the criterion "central hotline". Only 4 % of the central hotlines are reachable after 6 p.m. or during the weekend. Central contact partners are named in 38 % of the portals. Visible service guarantees are given in only 2 % of the portal offers.

4.2.4 Category 4: Form services for businesses

The form services are not widely matured. Form downloading services as basic services, are available in 44 % of the first language portals. The progressive services (criteria 17-20) are widely not distinctive available. So, help functions are not available in 84 % of the portals, digital signature is not offered in 58 %, application processing is not available in 58 % and connecting from form services to external bodies is not available in 92 % of the portals.

To assume the results for the categories 1- 4 shown above, figure 5 gives an overview of the reached points per category (cp. Annex 1).
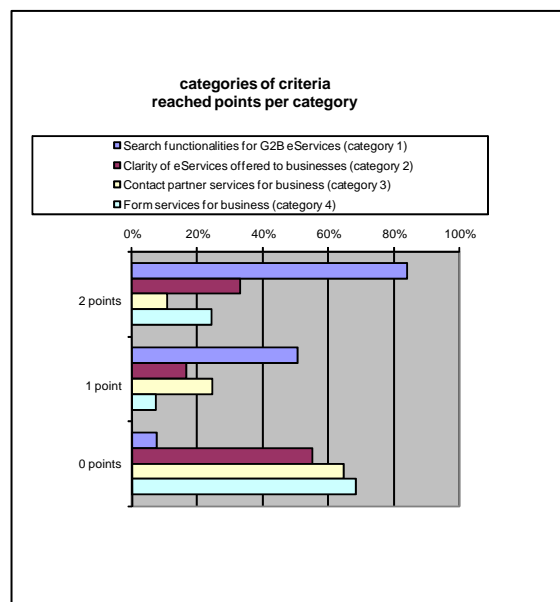
Figure 5: Overview of reached points per category

4.2.5 Category 5: Municipal G2B E-Services

For the municipal G2B E-Services we can assume that 20,80 % of the portals have to be categorized according to complexity level 0. 23,20 % do offer information services according to complexity level 1. Complexity level 2 (Download) is only fulfilled by 23,20 % of the portals. Interaction is only available in 7,80 % of the portals. Figure 6 shows the overall results:
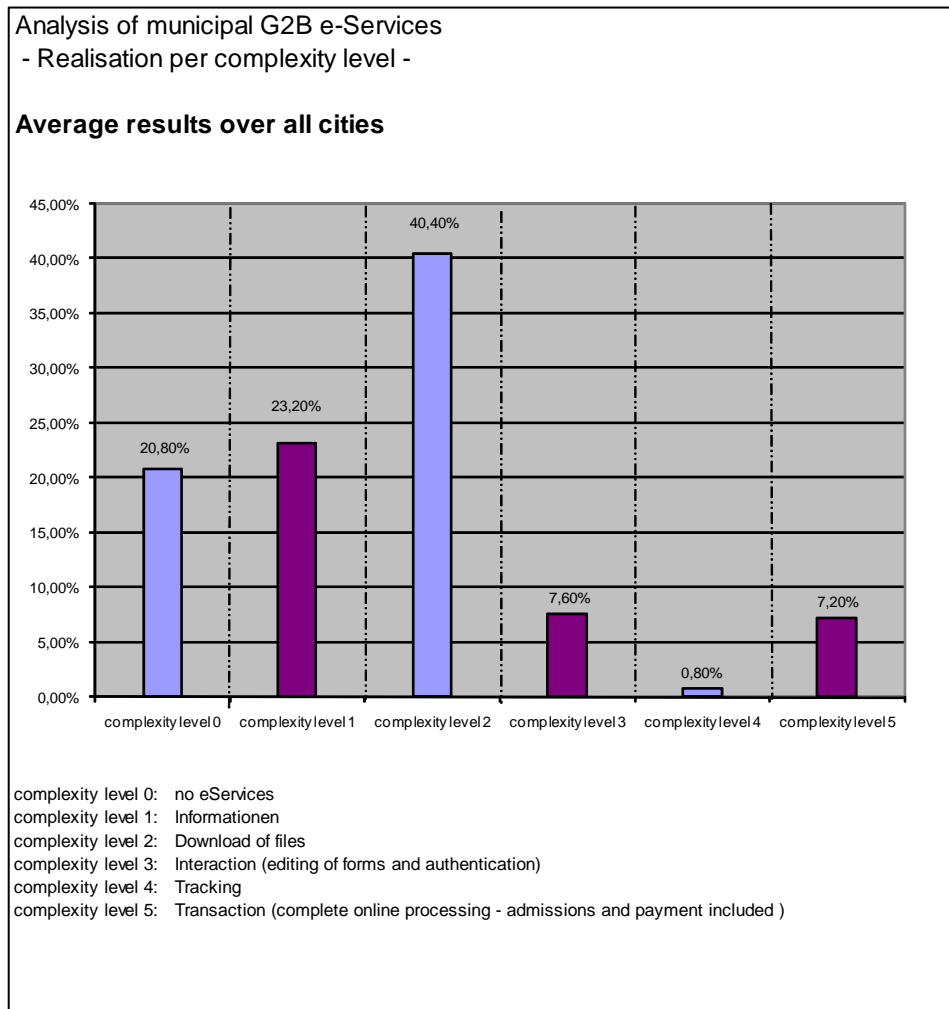
Figure 6: Overall results of category 5 G2B E-Services

The detailed results for the municipal services are described subsequently.
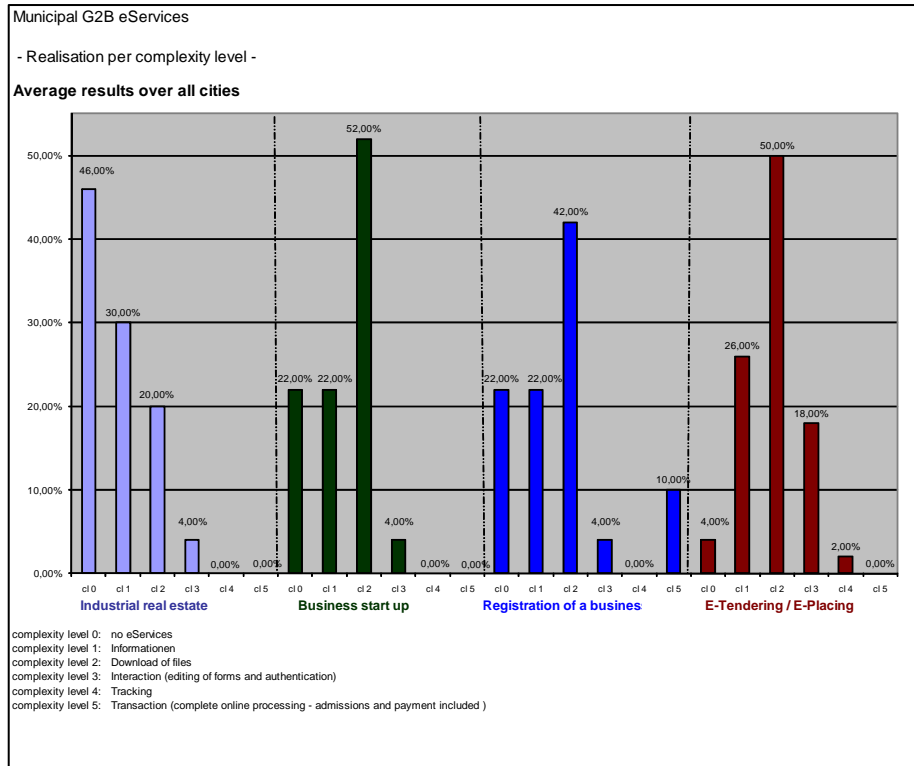
Figure 7: Complexity levels for four municipal services

As shown in figure 7, the most developed offers are available for "E-Tendering" services. Concerning the services "Industrial real estate and commercial property", "Services for founders of news businesses" and "Registration of a business", in 22% to 46 % of the portals are no E-Services available at all. The availability of services in the complexity levels 3 to 5 are marginal available. Exceptional are the services "Registration of a business" with 4 % offers in complexity level 3 and 10 % offers in complexity level 5 as well as "E-Tendering" offered on 20% of the portals in complexity levels 3 and 4.

4.3 Positioning of cities over all criteria

The results of the study can be subsumed to the following positioning of all cities:

Total portal positioning

Positioning	City	Points (of max. 150)
1	Arlington (TX)	96
2	Washington (DC)	93
3	Seattle (WA)	88
4	Los Angeles (CA)	85
5	Houston (TX)	84
6	Las Vegas (NV)	77
7	New York (NY)	76
7	Chicago (IL)	76
9	Fresno (CA)	72
10	Tucson (AZ)	70
11	Sacramento (CA)	67
12	Phoenix (AZ)	66
13	Indianapolis (IN)	64
14	San Diego (CA)	63
15	Portland (OR)	61
16	Long Beach (CA)	59
17	San Francisco (CA)	58
17	Charlotte (NC)	58
19	Albuquerque (NM)	56
19	Atlanta (GA)	56
21	Milwaukee (WI)	55
21	Virginia Beach (VA)	55
23	Mesa (AZ)	54
24	Louisville (KY)	53
24	Oakland (CA)	53
26	Denver (CO)	51
27	Kansas City (MO)	49
28	Philadelphia (PA)	47
29	El Paso (TX)	46
30	Minneapolis (MN)	45
31	Dallas (TX)	44
32	Boston (MA)	41
33	San Jose (CA)	40
34	San Antonio (TX)	37
34	Miami (FL)	37
36	Tulsa (OK)	35
37	Detroit (MI)	34
38	Austin (TX)	33

38	Baltimore (MD)	33
40	Oklahoma City (OK)	28
41	Jacksonville (FL)	27
41	Honolulu (HI)	27
43	New Orleans (LA)	26
44	Fort Worth (TX)	25
45	Colorado Springs (CO)	23
46	Columbus (OH)	22
47	Omaha (NE)	20
48	Memphis (TN)	15
49	Nashville-Davidson (TN)	6
50	Cleveland (OH)	0

Table 5: Positioning of all U.S. large and capital cities

A remarkable finding is that the best portal reaches 96 points of 150 possible points, that means only 64 % are reached. The most potential for reaching further points is seen in the development of complexity levels 3-5 for municipal services (cp. Annex 2).

4.4 Maturity levels of the portals

In chapter 3.3, we described the methodology for classifying the cities with the maturity levels. Our results show that (cp. Figure 8).

42 % of the cities reach maturity level 0,
34 % of the cities reach maturity level 1,
12 % of the cities reach maturity level 2 and
12 % of the cities reach maturity level 3
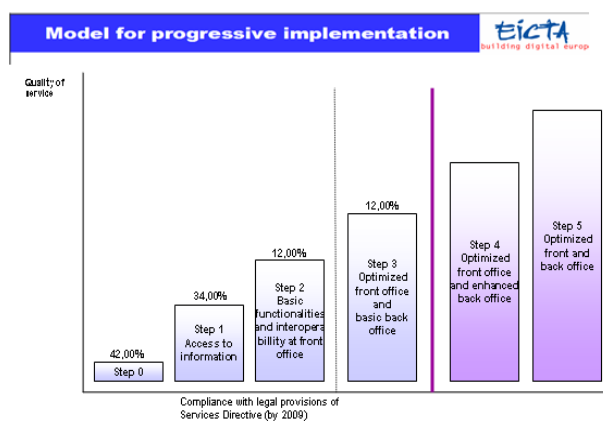
Figure 8: Maturity Levels of U.S. large and capital cities

Table 6 presents an overview on which city reaches maturity level 0, 1, 2 or 3.

Maturity Level	Cities
3	Washington (DC), Seattle (WA), Los Angeles (CA), Houston (TX), Las Vegas (NV), New York (NY)
2	Phoenix (AZ), Long Beach (CA), San Francisco (CA), Albuquerque (NM), Milwaukee (WI), Kansas City (MO)
1	Arlington (TX), Fresno (CA), Sacramento (CA), San Diego (CA), Charlotte (NC), Virginia Beach (VA), Mesa (AZ), Oakland (AZ), Denver (CO), Philadelphia (PA), Minneapolis (MN), Dallas (TX), Boston (MA), Miami (FL), Detroit (MI), Jacksonville (FL), Honolulu (HI)
0	Chicago (IL), Tucson (AZ), Indianapolis (IN), Portland (OR), Atlanta (GA), Louisville (KY), El Paso (TX), San Jose (CA), San Antonio (TX), Tulsa (OK), Austin (TX), Baltimore (MD), Oklahoma City (OK), New Orleans (LA), Fort Worth (TX), Colorado Springs (CO), Columbus (OH), Omaha (NE), Memphis (TN), Nashville-Davidson (TN), Cleveland (OH)

Table 6: Maturity Levels of U.S. large and capital cities

Finally, it is of interest, whether and how the maturity levels correlate with the positioning of the city. Figure 9 shows the correlation between the reached maturity level and the positioning.
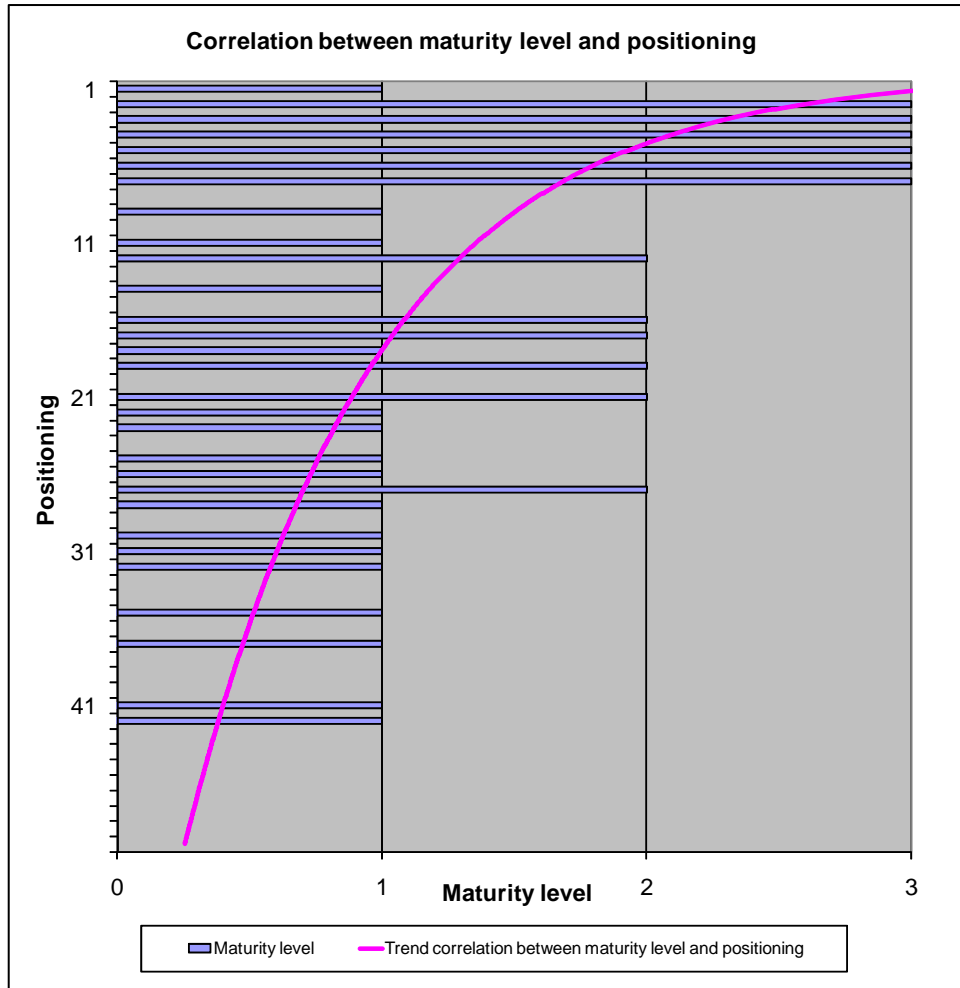
Figure 9: Correlation between the reached maturity level and the positioning

5 Summary and Outlook

The present report presents the findings of a G2B E-Services survey. The survey was accomplished in U.S. capital and large cities (more than 100.000 habitants) by a "third party web assessment".

The report provides an overview of the implemented services and of the state-of- the-art of maturity levels for the focused portals. Based on the procedural model for the Benchmarking of Service" – DIN PAS 1014 and conducted with the "Mystery User", the study was accomplished widely objective and close to reality. The validation of the working hypothesis leads to the following core findings:

1. Search functions and clarity of the E-Services presentation as minimum requirements are not that developed as expected. While search functions are widely available, the clarity of the offered E-Services is not well developed.

2. The naming of central contact persons is well, but not overwhelming developed in the considered portals. Potentials remain in the implementation of sustainable hotlines and visible service guarantees.

3. The Services GIS, photos and video clips, feedback functionalities and municipal core services as help functions for electronically provided forms still have a lack of development.

4. The classification on the basis of a maturity model shows, that there are widely low maturity levels at present. There is potential in the development offers fulfilling higher complexity levels.

5. The analysis shows that the maturity levels of portals are positive correlated to the positioning of the city.

The study shows, that there remains a potential for E-Services realized by ICT-implementations that support the development towards "One-Stop-EGovernment" for businesses [HKN08]. More development areas are presented in the field of integrated form management, which is identified as a field with growth potential. Moreover process optimisation and external tracking are also in the field of interest.

Additional demand for research is in the fields of quantitative research and permanent monitoring. For the first research field, multivariate analysis are planned to accomplish to validate the hypothesis further. The second research field comprises a concept for permanent, dynamic and multi-perspective benchmarking and monitoring of cities on the basis of a web-based instrument. Moreover, a comparative study comprising the U.S and Europe will be conducted.

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Annex 1: Points Matrix

Criteria catalogue, indicators and measurement units — Municipal G2B eServices {name of municipality}.xx (homepage respectively main portal) / criterion	weighting coefficient	New York (NY) 12.02.2009 8.143.197	Los Angeles (CA) 12.02.2009 3.844.829	Chicago (IL) 12.02.2009 2.842.518	Houston (TX) 12.02.2009 2.016.582	Philadelphia (PA) 11.02.2009 1.463.281	Phoenix (AZ) 11.02.2009 1.461.575	San Antonio (TX) 11.02.2009 1.256.509	San Diego (CA) 11.02.2009 1.255.540	Dallas (TX) 11.02.2009 1.213.825	San Jose (CA) 11.02.2009 912.332	Detroit (MI) 11.02.2009 886.671	Indianapolis (IN) 11.02.2009 784.118	Jacksonville (FL) 11.02.2009 782.623	San Francisco (CA) 11.02.2009 739.426	Columbus (OH) 11.02.2009 730.657	Austin (TX) 11.02.2009 690.252	Memphis (TN) 09.02.2009 672.277	Baltimore (MD) 09.02.2009 635.815	Fort Worth (TX) 09.02.2009 624.067	Charlotte (NC) 09.02.2009 610.949	El Paso (TX) 09.02.2009 598.590	Milwaukee (WI) 09.02.2009 578.887	Seattle (WA) 09.02.2009 573.911	Boston (MA) 09.02.2009 559.034	Denver (CO) 09.02.2009 557.917
Search functionalities for G2B eServices (category 1):		76	85	76	84	47	66	37	63	44	40	34	64	27	58	22	33	15	33	25	58	46	55	88	41	51
Does an official web portal for the considered city exist?	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Do link functionalities to a dedicated website for economy or businesses with bundled G2B eServices exist?	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Does the entry of search terms "economy" and / or "businesses" into the input field "search" lead to G2B eServices?	1	2	2	2	2	2	2	2	2	0	2	2	2	2	2	0	2	0	2	1	2	2	2	2	2	2
Search path from the main portal to the overview of G2B eServices on the business portal	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Clarity of eServices offered to businesses (category 2):																										
Does an dedicated web portal for economy or businesses exist?	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Is location information for businesses available?	1	2	2	2	2	2	2	2	2	2	0	2	0	1	2	1	0	0	2	0	2	2	2	2	2	2
Are there photos (optical impressions by static pictures from the location) available?	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Are there video clips (optical impressions by dynamic pictures from the location) available?	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Is a geographic information system (GIS) available (web.gis - applications)?	2	0	4	0	4	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4	4	0	4	0	4
Is a forum (e.g. idea box, suggestion box, complaint box) available?	2	4	4	4	4	0	4	0	0	0	4	0	4	0	4	0	4	0	4	4	0	4	0	0	0	0
Is a feedback possibility available?	2	4	0	4	4	0	0	0	4	0	4	0	4	0	4	0	0	0	0	0	0	4	0	4	2	4
Is the portal available multilingual (the portal is available at least in 1 foreign language)? - in which complexity level available on the business portal? -	3	0	6	0	6	0	6	0	0	6	0	0	0	0	0	3	6	0	0	0	0	0	0	6	0	0
Contact partner services for business (category 3):																										
Is a central hotline for businesses to contact the administration available?	1	0	1	0	2	0	1	1	1	0	1	0	1	0	1	0	1	0	1	1	1	1	1	1	0	1
Are central contact partner for businesses named?	2	0	4	0	2	0	0	2	0	0	0	0	2	0	0	0	2	0	0	0	4	4	2	4	0	4
Are visible service guarantees for initial responses by the administration available?	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0
Form services for business (category 4):																										
Are business-oriented form download services available?	2	4	4	0	4	4	0	0	0	0	2	0	4	0	4	0	0	0	0	0	0	2	4	2	4	4
Are help functions for forms and procedures (e.g. completion support, check lists) available?	2	0	0	4	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	4	0	0
Is digital signature for authentication embedded in the form management?	3	6	6	6	6	6	6	6	6	0	0	0	6	0	0	0	0	0	6	0	0	6	0	0	6	0
Is application processing per form directly online available?	3	6	3	6	6	0	3	3	3	0	0	0	6	0	0	0	0	0	0	0	3	0	0	6	0	0
Are the form services connected to external bodies (e.g. country administration, state administration)?	2	0	4	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0
Municipal G2B eServices (choice):																										
Industrial real estate and commercial property - in which complexity level available on the business portal? -	3	6	9	0	6	3	6	0	6	6	0	6	3	3	3	0	0	0	0	0	3	0	0	6	3	3
Services for founders of new businesses - in which complexity level available on the business portal? -	3	9	6	6	9	6	6	0	6	6	3	3	0	3	6	0	6	3	6	3	6	6	6	6	6	3
Registration of a business - in which complexity level available on the business portal? -	3	6	6	15	6	6	6	0	6	3	6	3	3	3	6	3	0	0	3	0	0	0	6	15	6	6
E-Tendering / E-Placing Registration of a business - in which complexity level available on the business portal? -	3	6	3	6	9	6	3	6	6	6	6	6	6	6	3	3	3	9	6	6	9	6	6	9	3	6
Other municipal business-oriented services - in which complexity level available on the business portal? -	3	15	15	15	6	6	15	9	15	9	6	6	15	3	6	6	3	3	0	0	15	6	6	15	6	6

Criteria catalogue, indicators and measurement units — Municipal G2B eServices {name of municipality}.xx (homepage respectively main portal) / criterion	weighting coefficient	Louisville (KY) 556.429 09.02.2009	Washington (DC) 550.521 09.02.2009	Nashville-Davidson (TN) 549.110 06.02.2009	Las Vegas (NV) 545.147 06.02.2009	Portland (OR) 533.427 06.02.2009	Oklahoma City (OK) 531.324 06.02.2009	Tucson (AZ) 515.526 06.02.2009	Albuquerque (NM) 494.236 06.02.2009	Long Beach (CA) 474.014 06.02.2009	Atlanta (GA) 470.688 06.02.2009	Fresno (CA) 461.116 06.02.2009	Sacramento (CA) 456.441 06.02.2009	New Orleans (LA) 454.863 05.02.2009	Cleveland (OH) 452.208 nur Oracle-Anzeige	Kansas City (MO) 444.965 05.02.2009	Mesa (AZ) 442.780 05.02.2009	Virginia Beach (VA) 438.415 05.02.2009	Omaha (NE) 414.521 05.02.2009	Oakland (CA) 395.274 05.02.2009	Miami (FL) 386.417 05.02.2009	Tulsa (OK) 382.457 05.02.2009	Honolulu (HI) 377.379 05.02.2009	Minneapolis (MN) 372.811 05.02.2009	Colorado Springs (CO) 369.815 05.02.2009	Arlington (TX) 362.805 05.02.2009
Search functionalities for G2B eServices (category 1):		53	93	6	77	61	28	70	56	59	56	72	67	26	0	49	54	55	20	53	37	35	27	45	23	96
Does an official web portal for the considered city exist?	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1
Do link functionalities to a dedicated website for economy or businesses with bundled G2B eServices exist?	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	0	1	1	1	1
Does the entry of search terms "economy" and / or "businesses" into the input field "search" lead to G2B eServices?	1	2	2	2	2	2	0	2	2	2	2	2	2	0	0	2	2	2	0	2	2	2	2	2	2	2
Search path from the main portal to the overview of G2B eServices on the business portal	1	2	2	0	1	1	1	2	2	2	2	2	2	2	0	2	2	1	0	2	2	1	2	2	2	2
Clarity of eServices offered to businesses (category 2):																										
Does an dedicated web portal for economy or businesses exist?	2	2	2	0	2	2	2	2	2	2	2	2	2	2	0	2	2	2	0	2	2	2	2	2	2	2
Is location information for businesses available?	1	2	2	2	2	2	2	1	2	2	2	2	2	2	0	2	2	2	2	2	1	1	2	1	2	2
Are there photos (optical impressions by static pictures from the location) available?	1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Are there video clips (optical impressions by dynamic pictures from the location) available?	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	1
Is a geographic information system (GIS) available (web.gis - applications)?	2	0	0	0	0	0	0	0	4	0	0	0	4	0	0	0	4	0	0	0	0	0	0	0	0	4
Is a forum (e.g. idea box, suggestion box, complaint box) available?	2	4	4	0	4	0	4	4	4	4	0	4	0	4	0	0	4	4	0	0	4	0	4	4	4	4
Is a feedback possibility available?	2	4	4	0	4	4	4	0	4	0	4	4	0	4	0	0	4	4	4	0	4	0	4	0	2	4
Is the portal available multilingual (the portal is available at least in 1 foreign language)? - in which complexity level available on the business portal? -	3	0	6	0	6	0	0	6	6	0	0	3	0	0	0	6	3	3	0	6	6	0	0	6	0	0
Contact partner services for business (category 3):																										
Is a central hotline for businesses to contact the administration available?	1	1	1	0	1	1	1	1	1	1	1	0	1	1	0	1	1	1	0	0	0	1	0	2	0	1
Are central contact partner for businesses named?	2	0	0	0	4	0	0	0	4	0	4	0	4	0	0	4	0	4	0	4	0	0	0	0	2	4
Are visible service guarantees for initial responses by the administration available?	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Form services for business (category 4):																										
Are business-oriented form download services available?	2	4	4	0	4	4	0	4	0	4	2	4	4	0	0	4	4	4	0	0	4	0	2	0	2	4
Are help functions for forms and procedures (e.g. completion support, check lists) available?	2	0	4	0	0	0	0	0	4	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Is digital signature for authentication embedded in the form management?	3	0	6	0	6	6	0	6	0	0	6	6	6	0	0	0	0	0	0	0	0	0	0	0	0	6
Is application processing per form directly online available?	3	3	6	0	3	6	0	6	0	3	3	3	3	0	0	0	0	0	0	0	3	0	0	0	0	6
Are the form services connected to external bodies (e.g. country administration, state administration)?	2	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Municipal G2B eServives (choice):																										
Industrial real estate and commercial property - in which complexity level available on the business portal? -	3	0	6	0	6	0	0	0	0	6	0	0	0	0	0	0	0	3	9	0	3	3	3	3	3	3
Services for founders of new businesses - in which complexity level available on the business portal? -	3	6	6	0	6	3	0	0	6	3	0	6	6	6	0	6	6	3	0	6	3	0	3	6	0	6
Registration of a business - in which complexity level available on the business portal? -	3	9	15	0	6	9	3	15	6	6	6	6	6	0	0	6	6	6	3	6	3	0	3	3	0	15
E-Tendering / E-Placing Registration of a business - in which complexity level available on the business portal? -	3	6	6	3	12	9	6	3	6	9	9	9	6	3	0	6	3	3	6	9	3	6	6	6	0	3
Other municipal business-oriented services - in which complexity level available on the business portal? -	3	6	15	0	6	6	3	15	6	9	15	15	12	0	0	6	6	3	6	6	9	6	3	3	3	15

Average of criteria	first language	first language	first language
	2 points	1 points	0 points
Search functionalities for G2B eServices (category 1):			
Does an official web portal for the considered city exist?		98,0%	2,0%
Do link functionalities to a dedicated website for economy or businesses with bundled G2B eServices exist?		92,0%	8,0%
Does the entry of search terms "economy" and / or "businesses" into the input field "search" lead to G2B eServices?	84,0%	2,0%	14,0%
Search path from the main portal to the overview of G2B eServices on the business portal	84,0%	10,0%	6,0%
average:	**84,0%**	**50,5%**	**7,5%**
Clarity of eServices offered to businesses (category 2):			
Does an dedicated web portal for economy or businesses exist?		94,0%	6,0%
Is location information for businesses available?	72,0%	12,0%	16,0%
Are there photos (optical impressions by static pictures from the location) available?	4,0%	0,0%	96,0%
Are there video clips (optical impressions by dynamic pictures from the location) available?	2,0%	6,0%	92,0%
Is a geographic information system (GIS) available (web.gis - applications)?	22,0%	0,0%	78,0%
Is a forum (e.g. idea box, suggestion box, complaint box) available?	54,0%	0,0%	46,0%
Is a feedback possibility available?	44,0%	4,0%	52,0%
average:	**33,0%**	**16,6%**	**55,1%**
Contact partner services for business (category 3):			
Is a central hotline for businesses to contact the administration available?	4,0%	62,0%	34,0%
Are central contact partner for businesses named?	26,0%	12,0%	62,0%
Are visible service guarantees for initial responses by the administration available?	2,0%	0,0%	98,0%
average:	**10,7%**	**24,7%**	**64,7%**
Form services for business (category 4):			
Are business-oriented form download services available?	44,0%	10,0%	46,0%
Are help functions for forms and procedures (e.g. completion support, check lists) available?	14,0%	2,0%	84,0%
Is digital signature for authentication embedded in the form management?	38,0%	0,0%	62,0%
Is application processing per form directly online available?	18,0%	24,0%	58,0%
Are the form services connected to external bodies (e.g. country administration, state administration)?	8,0%	0,0%	92,0%
average:	**24,4%**	**7,2%**	**68,4%**