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‘YOU GOT E-GOVERNMENT?’ – A QUANTITATIVE ANALYSIS OF IN- AND EXCLUSIVENESS OF ELECTRONIC PUBLIC SERVICE DELIVERY

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Abstract

Digital divide is, despite all efforts in research and practice, a matter of fact in most societies. In search for specific strategies to promote digital inclusion, one has to ask for what are the specific reasons and factors behind the problem. Here, the field of eGovernment (Electronic Government) features several particular characteristics, including high privacy and security demands or high complexity of administrative processes, which might hinder the societal inclusiveness of such electronic public service delivery. Addressing the question of what could be possible explanations for lacking inclusiveness in eGovernment, we conduct a quantitative analysis of statistical data on eGovernment usage in Europe, taking into account specific digital divide groups, such as senior citizens, people with low education or people without employment. In order to contextualise our findings, we discuss the case of inclusiveness of eGovernment in Germany. We contrast eGovernment usage (on an informational and transactional level) with eCommerce and internet usage. Here, specific inclusion gaps in eGovernment and their underlying issues are analysed and specific recommendations given.

Keywords: eInclusion, eSociety, eGovernment, Technology Adoption.

1 INTRODUCTION

eGovernment (electronic Government) is the key element to modernising public administrations. In the move of the Lisbon-Agenda, all EU (European Union) member states have committed to implementing an eGovernment-oriented strategy of public administration modernisation. Web-based information and communication technologies are intended to become the primary channel for public service delivery. According to the (European Commission 2006b), in 2004 an average of 84% of all public services was available online in the EU member states and 40% of such online services enabled transactional eGovernment. For 2007, the average level of the sophistication of online government services is the transactional level (Capgemini 2007).

Lacking inclusion¹ in eGovernment is primarily a demand side problem. Despite such positive efforts to provide (transactional) eGovernment services, analyses of usage numbers and user structures indicate that digital exclusion today is primarily a demand side rather than a supply side issue. Here, especially senior citizens, and people without employment or with low education are still very much excluded from participation in electronic services (European Commission 2006c, Timmers 2007). Against this background, the EU initiative i2010² set up a comprehensive strategy to strengthen citizen-centric inclusive eGovernment services. In June 2006, the EU ministerial conference declared to strengthen digital integration by eGovernment (e-inclusive public services), to include elderly people (eAging), to widely distribute electronic services (geographical digital divide), to increase accessibility of e-public services (eAccessibility), and to strengthen digital competency (eCompetency) and cultural diversity by digital integration (cultural eInclusion). Such strategy reflects in specific efforts to provide citizen-centric services, which aim at understanding the problems and issues of those who are supposed to use them.

Operable inclusion strategies need further explanation of what determines exclusiveness in eGovernment usage. While both literature and political practice acknowledge the variety of problem spheres behind non-usage of the Internet and, in alignment, eGovernment, there is little empirical explanation of which distinct factors impact on the eGovernment inclusion gap and to what extent (Kaplan 2005). Is it e.g. the complexity of services or a general reluctance of people to use the internet or to conduct security-relevant processes online? Accordingly, it is not yet clear to a necessary extent which actors should be involved in and hold responsibility for what share of an inclusion strategy in order to overcome the digital divide – here especially the social digital divide – in eGovernment. Taking the example of Germany and relating it to findings from other EU member states, we therefore seek to address the research question of

What is the current state of inclusive eGovernment and which factors could explain a possible inclusion gap to which extent?

In order to address this research question, the following section will relate our analysis to prior studies and the existing literature (Section 2). The research design and methodology will be discussed in Section 3, focusing on a quantitative analysis of comprehensive newest Eurostat data from a national (Germany, Denmark, France, Netherlands, and Norway) and social digital divide group perspectives (senior citizens, people with low education, unemployed, people from thinly populated areas). Following a comparative presentation and discussion of relevant data (Section 4), a comprehensive

¹ Within in this paper, *inclusion* is to be understood as (process towards the) ideal state in which the number of actual users of a certain technology or service converges towards the number of all of its potential users. The residual variable, those who are not included can be considered as *excluded*. The (sectoral-/social-/national-)comparative view on such degree of exclusion – with regard to the usage of ICT – may be considered as an indicator of a *digital divide*. For a broad definition of eInclusion see also Kaplan, D. (2005). e-Inclusion: New challenges and policy recommendations.

http://ec.europa.eu/information_society/eeurope/2005/doc/all_about/kaplan_report_einclusion_final_version.pdf.

² http://ec.europa.eu/information_society/eeurope/i2010.

data interpretation shall offer explanations for inclusion gaps in (German) eGovernment and identify potential operational strategies to overcome a digital divide in eGovernment (Section 5). The paper will conclude with a summary of results and an outlook to potentially fruitful avenues for future research (Section 6).

2 INTRODUCTION

The topic of E-Inclusion – participation for all in the digital, knowledge-based information society – has been gaining significant awareness across European public administrations with the upcoming of the European Commission's strategic policy framework program i2010 and its implications for an inclusive information society. In June 2005 the i2010 EU initiative³ was launched and devoted to a set of broad policy guidelines and prioritises three major policy fields: creating a single information space, fostering innovation and investment in research and technological leadership in the EU and promoting an inclusive European information society. Focusing on the third pillar of the i2010 initiative, social inclusion in the digital information society (E-Inclusion) becomes the key to an inclusive e-society. However, the i2010 initiative does not just suggest inclusion in general, but specifies priority issues, such as more inclusive public services, which leads us to inclusive E-Government.

With the Riga Ministerial Declaration (2006), the European Commission has further specified this goal of E-Inclusion in an E-Government context. Here, E-Government, in a wider sense, is to be understood as information technology (IT) usage in governments/public administrations. Within this paper, we will focus on those elements of E-Government that involve the demand side, meaning citizens or businesses. Accordingly, E-Government here circles around the web-based electronic public service delivery. Such inclusive E-Government means, for example, that by 2010 all public websites are to be compliant with the relevant W3C common web accessibility standards and guidelines. Furthermore, it is stated that the design and delivery of key services and public service policies shall be user-centric and inclusive, “using channels, incentives and intermediaries that maximise benefits and convenience for all so that no one is left behind.” (European Commission 2006b) Finally it also proposes to ensure “that electronic documents are available in such a way that they can be used by people with disabilities in an appropriate and, where possible, EU-wide recognised” (European Commission 2006) format. With these statements, declared by 34 member countries, E-Inclusion in E-Government or inclusive E-Government becomes a key issue in many EU countries. A major measurable goal, set by the Riga Ministerial Declaration – and also motivating this study on barriers for inclusive E-Government – is the ambition to address E-Inclusion by reducing “the differences in Internet usage between current average use by the EU population and use by elderly people, people with disabilities, women, lower education groups, unemployed and ‘less-developed’ regions” (European Commission 2006b) by half, comparing 2010 to 2005. With our study we seek to contribute to this timely topic and identify possible grounds for existing E-Inclusion gaps, so that future studies can focus on how to properly address these barriers to inclusive E-Government.

Much related work on E-Government and E-Inclusion exist. Core questions in this field are, for instance, of E-Government barriers (Sanchez, et al. 2003), user perception of E-Government initiatives (Lee & Kim 2006), Digital Divide in E-Government (Hüsing & Selhofer 2004)

3 RESEARCH METHODOLOGY

In order to answer the research question, a comprehensive quantitative analysis of current Eurostat data from 2006 (Eurostat 2007) on individual internet-based service usage was conducted. A methodical description of the survey is given in (European Commission 2006a). Although such data is

³ http://ec.europa.eu/information_society/eeurope/i2010.

secondary data and publicly available, a specific investigation into the in- and exclusiveness in European, and specifically German eGovernment has not yet been undertaken. Consequently, the analysis of such comprehensive and high quality data (e.g., net sample size Germany: 21.160, Denmark: 2830, France 5603, the Netherlands: 3745, Norway: 1143) offers great potential to shed new light on the question of the status-quo of inclusive eGovernment and on the factors which could explain a possible inclusion gap, also regarding the case of Germany.

In order to analyse such possible inclusion gaps in German eGovernment, data regarding internet, eCommerce, eBanking and eGovernment usage is contrasted (Hüsing & Selhofer 2002, Hüsing & Selhofer 2004, Kaplan 2005). Here, eCommerce and eBanking can be regarded as services on a transactional level involving comparatively complex processes and security-related aspects. Regarding such transactional services, it is specifically insightful to differentiate between distinct degrees of interaction in eGovernment (eGovernment for information, downloading forms, and transaction) and to contrast transactional eCommerce with transactional eGovernment (Ngai & Wat 2002, Srivastava & Teo 2006). Accordingly, Table 1 provides the analysis dimensions (regarding distinct services) and their corresponding questions (Q).

Internet	Q: I have used the Internet in the last 3 months
eCommerce	Q: I bought/ordered goods/services, over the Internet, for non-work use, in the last 3 months
eBanking	Q: I have used Internet, in the last 3 months, for Internet banking
eGovernment for Information	Q: I have used Internet, in the last 3 months, for obtaining information from public authorities web sites
eGovernment for Downloading Forms	Q: I have used Internet, in the last 3 months, for downloading official forms
eGovernment for Transaction	Q: I have used Internet, in the last 3 months, for sending filled forms

Table 1: (Individual) Usage of Internet, eCommerce, eBanking and eGovernment and Corresponding Questions

Moreover, in order to allow for a deeper analysis of non-usage of eGovernment services, reasons for non-usage (on an individual basis) are taken into account and range from non-availability of services over concerns about data security, privacy or costs to complexity of (electronic) public services (see Table 2).

Service not available / too difficult to find	Q: I'm not using Internet for dealing with public services or administrations, because: The services I need are not available on-line or difficult to find
Personal contact missed	Q: I'm not using Internet for dealing with public services or administrations, because: I miss personal contact
Immediate response missed	Q: I'm not using Internet for dealing with public services or administrations, because: I miss immediate response
Concerned about data security	Q: I'm not using Internet for dealing with public services or administrations, because: I'm concerned about protection and security of my data
Concerned about additional costs	Q: I'm not using Internet for dealing with public services or administrations, because: I'm concerned about additional costs
Too complex	Q: I'm not using Internet for dealing with public services or administrations, because: it's too complex
Other reasons	Q: I'm not using Internet for dealing with public services or administrations, because of other reasons

Table 2: (Individual) Reasons for Non-Usage of eGovernment and Corresponding Questions

These two analysis dimensions (usage data and reasons for non-usage) are mirrored against selected EU-country perspectives (besides Germany: Denmark, France, the Netherlands and Norway) and against potential digital divide group perspectives (besides population average: senior citizens of age 55 to 74, citizens with low education - ISCED Education Levels 0, 1 or 2 -, citizens living in thinly populated areas - areas with up to 100 inhabitants per square kilometer - and citizens without employment).

4 DATA: IN- AND EXCLUSIVENESS IN EGOVERNMENT

Analysing in- and exclusiveness of electronic public service delivery in Germany, data regarding internet, eCommerce, eBanking, and eGovernment usage was contrasted. Here, distinct levels of interaction in eGovernment were differentiated (eGovernment for information, downloading forms, and transaction). An international comparison (Germany, Denmark, France, Netherlands, and Norway) in these dimensions provided the following key results (see Table 3). Similar Data was also found for the UK (Dutton & Helsper 2007).

- Internet is used in Denmark, Norway, and the Netherlands by more than 80% of the population, while the French show a usage ratio of 47% (see also Brousseau 2003). In that regard, German usage numbers of 69% position in the middle.
- eGovernment usage in Norway and the Netherlands is, comparatively, very high on an informational (the Netherlands: 46%, Norway: 52%) as well as transactional level (the Netherlands: 30%, Norway: 28%).
- Even though Germany features higher usage numbers in all categories compared to France, 12% of the French population have used transactional eGovernment while only 9% of the Germans have done so. The comparatively lowest transactional eGovernment usage number in Germany is the consequence.
- In Germany, there is a continuous reduction of usage numbers from regular internet usage, to complex eCommerce and eBanking usage to eGovernment usage. Within the eGovernment usage, information is more often acquired over the internet than forms downloaded than eGovernment used for transactions.

	Germany	Denmark ^a	France	Netherlands	Norway
Internet	69%	83%	47%	81%	81%
eCommerce	38%	31%	19%	36%	47%
eBanking	32%	57%	18%	59%	67%
eGovernment for Information	28%	39%	24%	46%	52%
eGovernment for Downloading Forms	17%	20%	14%	27%	30%
eGovernment for Transaction	9%	17%	12%	30%	28%

Source: Data based on Eurostat (2006)

a - Data for Denmark refers only to the last month

Table 3: Usage of Internet and eGovernment by Country

Analysing the specific reasons for non-usage (European Commission 2006c) in such country perspectives led to the following key findings (see Table 4):

- Personal contact is in all countries mentioned more often than the average to be a reason for non-usage (as country averages being standardised '1', for instance, in Germany 49% ($1,95 \cdot 25\% = 49\%$) of the population perceive missing personal contact as a major reason for non-usage of eGovernment services).
- In Germany, concerns about data security were mentioned as a major reason for non-usage of eGovernment services. None of the other country populations have mentioned concerns regarding data security more often than the country average.
- In Norway and the Netherlands, the two countries with the highest number of informational as well as transactional eGovernment usage, additional costs were nearly no concern.

Relation to country average ^a	Germany	Denmark	France	Netherlands	Norway
Service not available / too difficult to find	0,85	0,98	n.a.	0,30	0,41
Personal contact missed	1,95	1,01	n.a.	1,74	2,78
Immediate response missed	0,52	1,01	n.a.	0,87	1,19
Concerned about data security	1,59	0,98	n.a.	0,72	0,43
Concerned about additional costs	0,51	0,92	n.a.	0,07	0,05
Too complex	0,95	0,95	n.a.	0,38	0,62
Other reasons	0,63	1,14	n.a.	2,92	1,52
Country Average	1 (25% ^b)	1 (70%)	n.a.	1 (19%)	1 (19%)

Source: Data based on Eurostat (2006)

a - Relation to country average used because averages differ highly between countries

b - Country average: In average any of the given reasons for non-usage has been mentioned, regarding this example, by 25% of the German population.

Table 4: *Reasons for Non-Usage by Country*

In order to analyse the role of certain digital divide groups (senior citizens, citizens with low education or without employment and people from thinly populated areas) regarding the in- and exclusiveness of German eGovernment, group-specific data on internet, eCommerce, eBanking, and eGovernment usage was examined (Table 5):

- All digital divide groups feature generally lower usage numbers in all analysed dimensions compared to the German population average (single exception: informational eGovernment by unemployed citizens).
- Senior citizens (age 55 to 74) are most affected by the digital divide and show lowest usage numbers in all dimensions (Internet, eCommerce, eBanking, all types of eGovernment).
- Even though citizens with low education use the internet less often than the average (low ed.: 61%, average: 69%), the usage of eCommerce, eBanking, and eGovernment is over-proportionally little. For instance, 55% (=av.eComm.usage/av.Internet.usage; 32%/69%) of all population Onliners use eCommerce, while only 47% of the Onliners with low education do so. Comparing these two groups, the Onliners' usage in eBanking (pop.average: 46%, low ed.: 32%), and transactional eGovernment (pop.average: 13%, low ed.: 8%) provides a similar picture.

	Total population	Senior citizens (55-74)	Citizens with low education	Thinly populated areas	Unemployed citizens
Internet	69%	37%	61%	65%	66%
eCommerce	38%	15%	29%	35%	31%
eBanking	32%	16%	20%	29%	27%
eGovernment for Information	28%	12%	17%	22%	29%
eGovernment for Downloading Forms	17%	8%	10%	15%	15%
eGovernment for Transaction	9%	n.a.	5%	8%	7%

Source: Data based on Eurostat (2006)

Table 5: *Usage of Internet and eGovernment by population groups in Germany*

Analysing the specific reasons for non-usage in such digital divide group perspectives led to the following key findings (see Table 6):

- As for the population average, missing personal contact, concerns about data security, and the complexity of services are considered as major reasons for eGovernment non-usage among digital divide groups in Germany.

- Concerns about data security were mentioned as reasons for non-usage of eGovernment 1.27 times and 1.22 times more often by senior citizens resp. citizens from thinly populated areas than the population average.
- The complexity of eGovernment services was mentioned as a reason for non-usage 1.24 times and 1.13 times more often by senior citizens resp. unemployed citizens than the population average.

	Total population	Senior citizens (55-74)	Citizens with low education	Thinly populated areas	Unemployed citizens
Relation to population average ^a					
Service not available / too difficult to find	1 (21%)	0,78	0,96	0,99	n.a.
Personal contact missed	1 (48%)	1,08	0,92	1,04	1,03
Immediate response missed	1 (13%)	n.a.	1,04	0,94	n.a.
Concerned about data security	1 (40%)	0,93	0,85	1,03	1,11
Concerned about additional costs	1 (13%)	1,27	0,87	1,22	n.a.
Too complex	1 (24%)	1,24	0,95	1,01	1,13
Other reasons	1 (16%)	0,89	1,17	0,90	n.a.

Source: Data based on Eurostat (2006)

- a - Relation to population average used to highlight group specific reasons
 E.g., 0,78 (Senior citizens, Reason: Service not available) represents 16% ($0,78 \cdot 21\% = 16\%$) of the senior citizens giving that very reason.

Table 6: Reason for Non-Usage by Population Group in Germany

5 DISCUSSION AND INTERPRETATION: GAP ANALYSIS

Operational strategies for inclusive eGovernment necessitate a specification of the inclusion gap. In order to be able to derive toeholds for operational steps to overcome the given inclusion gap in German eGovernment, a detailed analysis of the inclusion gap is necessary. Here, full inclusiveness could be understood as (process towards the) ideal state in which the number of actual users of a certain technology or service converges towards the number of all of its potential users. In this context, the total population (100%) can be considered as the full potential of users. On the other hand, only 9% of such total population did use eGovernment for transaction (within the given time frame). The resulting inclusion gap concerning eGovernment in Germany, in the widest sense, comprises 91%. However, to answer the question of why 91% of the population did not use transactional eGovernment, further explanation and differentiation are needed (Kaplan 2005). Therefore, by further taking into account internet usage, eCommerce transactions and informational eGovernment, different gaps of inclusion can be differentiated from one another (see Figure 1):

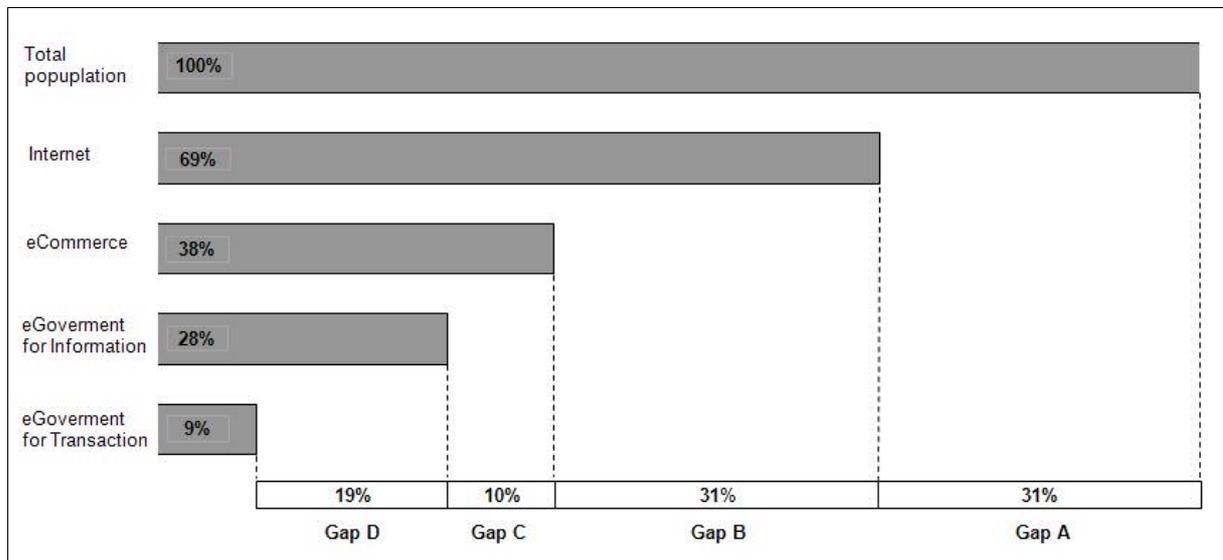


Figure 1: eGovernment Inclusion Gaps in Germany

Gap A: [Total Population – Internet Usage]

In Germany, only 69% of the total population used the internet (during the last three months). Consequently, a number of 31% of the population (Gap A) have not used the internet during this time frame. The following aspects could offer toeholds for interpreting such inclusion gap:

- Infrastructure. eInclusion literature offers several issues which might impact on infrastructure availability. For instance, internet and broadband connection is not given in some under-populated areas (see internet usage in thinly populated areas is 0.65; compared with 0.69 average).
- Accessibility. Taking into account the social and socio-demographical view on inclusion, age and education influence internet usage. For instance, senior citizens (of age 55 to 74) did use the internet in only 37% of all cases, citizens with low education in 61% (compared with 69% population average).

Gap B: [Internet Usage – eCommerce Usage]

While 69% of the total population have used the internet (during the last three months) only 38% of the population have used it for buying or ordering goods over the internet. This leaves a number of 31% of the population being online but not utilising eCommerce services (Gap B). The following aspects could offer toeholds for interpreting this inclusion gap:

- Security, trust, complexity. Besides such factors of infrastructure and accessibility (as discussed above), eCommerce usage involves issues as security, trust, and service complexity (Aldridge & White & Forcht 1997). eCommerce habitually involves financial transactions and monetary investments, often requiring providing credit card details, security mechanisms, personal data etc. Here, for instance, 55% of all population Onliners use eCommerce, while only 47% of the Onliners with low education do so. Moreover, only 41% of the senior citizen Onliners did use eCommerce offerings during the last 3 months.

Gap C: [eCommerce Usage – eGovernment for Information]

While 38% of the Germans used eCommerce services (during the last three months) only 28% have used it for obtaining information from public authority websites (eGovernment for Information). This

leaves a number of 10% of the population being willing to utilise eCommerce but not eGovernment (Gap C). The following aspects could offer footholds for interpreting such inclusion gap:

- Marketing and marketability. Besides such factors mentioned above (e.g., accessibility, trust, complexity etc.) marketing and marketability of electronic public services might influence eGovernment non-usage. While commercial services are habitually higher frequented than governmental services, still 21% of the German population state as a reason for not using eGovernment that the demanded service would not be available or would be hard to find. While commercial internet has already developed and made use of technology potential, such as amazon.com, ebay.com or diverse social network services, public sector offerings are still missing such 'killer applications'. The simple fact of missing marketing budgets for advertising eGovernment services, at least in German public administrations, adds on to such eGovernment inclusion gap. See also (Kaplan 2005) regarding transitory gaps.
- Personal contact. 48% of the population is reluctant to make use of eGovernment services due to missing personal contact. Interpretations could be that a) eCommerce services are nowadays much more established and perceived to be on an adequate security level, b) eGovernment services are a more sensitive field to the citizens, and/or c) eGovernment services and their underlying processes are perceived as very complex and intransparent so that people seem to be in need of reliable and personal guidance through the complexity of administrative issues.

Gap D: [eGovernment for Information – eGovernment for Transaction]

28% of the German population made use of informational eGovernment during the last three months, while only 9% conducted online transactions in this area. This leaves a number of 19% 'looking, but not booking' (Gap D). The following aspects could offer footholds for interpreting such inclusion gap (see also West 2004):

- Security and service complexity. While factors of security and service complexity have been discussed relating to transactional eCommerce (38% usage), these issues seem to affect transactional eGovernment in an even stronger manner (only 9% usage). Here, 40% of the population name concerns about data security as a major reason for not using eGovernment. Service complexity, mentioned in 24% of the cases, plays an evenly important role in non-usage behaviour. Regarding such complexity concerns, digital divide groups are strongly affected: for instance, senior citizens name complexity as non-usage reason 1.24 times as often as the population average (unemployed: 1.13 times, thinly populated: 1.01 times).
- Costs. Going hand in hand with security issues in eGovernment, costs become an important reason of non-usage. This holds specifically true for transactional services which, in governmental fields, require rigid authentication and authorisation mechanisms. While eCommerce often only relies on password or credit card details and eBanking often utilises a PIN & TAN-method, transactional eGovernment (in Germany) in most cases requires an electronic/digital signature. Investment costs regarding necessary equipment seem to be a major concern for senior citizens and people from thinly populated areas which mentioned costs as reason for non-usage of eGovernment 1.27 respectively 1.22 times as often as the average population (giving this reason in 13% of the cases).

Taking into account these different inclusion gaps in German eGovernment and their underlying currents, operational inclusion strategies have to be developed. This may include, for instance, general measures in order to further establish an inclusive information society, e.g. measures to increase internet literacy, infrastructure projects etc. Such measures would increase the web usage among the population and/or specific digital divide groups (Gap A). On the other hand, one might also identify shares of the inclusion gap which might possibly be addressed by eGovernment managers. For instance, corresponding measures could address creating a certain awareness among citizens for available services (Gap C) or engineering eGovernment services in a way that they are less complex, easier to understand, bundled more accessibly (Wimmer 2002), and/or guided by avatars, learning sessions etc (Gap D).

6 SUMMARY AND FUTURE RESEARCH

From the perspective of eGovernment managers, there is an uncertainty of which measures to undertake in order to increase inclusiveness of electronic public service delivery. One can identify several problem streams, issues and barriers overlapping and adding upon one another creating the current picture of prevailing eGovernment exclusiveness. But which measures are to be undertaken from the perspective of an eGovernment manager, maybe on the local administrative level, and to which extent do such measures potentially impact in- and exclusion? Here, an analysis of different inclusion gaps in Germany, based on current Eurostat data (2006), provided a more differentiated picture. 19% of the population make use of informational, but not transactional eGovernment services. In this regard, concerns regarding service complexity, data security, and costs are mentioned as major reasons for non-usage. Such issues were even over-proportionally often named by senior citizens, people from thinly populated areas, and citizens without employment. Getting citizens 'from looking to booking' seems to necessitate measures aiming at the general population, but also measures taking into account specific digital divide group needs. Moreover, as 38% of the population utilise eCommerce services, seemingly, e.g. accessibility, security, and service complexity issues did not hold back more than a third of the Germans from high value internet services. This leaves implications for eGovernment managers to further improve electronic public services delivery and maybe also to stimulate an awareness for such services by means of marketing.

Further research might aim at collecting best-practices and successful projects on inclusive eGovernment. Here, the analysis undertaken to identify specific inclusion gaps might help to structure such efforts.

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