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Local E-Government in Norway

Current Status and Emerging Issues

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Abstract. Recent studies indicate that e-government initiatives have not held their promise of improving government services. The majority of efforts to benchmark e-government have had central government as the unit of analysis. This study employs the MeGAP-3 (The Municipal E-Government Assessment Project) assessment tool to assess the status of municipal e-government in the Agder region in southern Norway, an area with high Internet penetration and mature information and communication technology (ICT) use. MeGAP-3 proved effective in providing a relative positioning of these Norwegian municipalities, but we argue that country specific assessment indicators are needed to complement the tool and enable cross-country comparisons by relative scores. Surprisingly, the results show that the sophistication of local government web sites was fairly low. A series of qualitative interviews were con-

ducted to explore the factors that shape the development of municipal e-government. The evidence suggests that the dominant stakeholder in development is the bureaucratic administration rather than citizens or politicians. This group has a strong focus on internal efficiency and cost reduction. The majority of respondents report cost reduction as the major driver behind e-government development. However we also identified a more citizen-centric approach that stresses the need for improving access and service quality for citizens. The study outlines a number of areas where further research will be needed to fully understand the development of e-government in Norway.

Key words: local e-government, e-government benchmarking, local government web site assessment.

1 Introduction

For several years, governments throughout the world have been seeking to provide electronic access to government services. Key reasons for this public sector reform have been to increase the efficiency of government operations, strengthen democracy, enhance transparency, and provide better and more versatile services to citizens and businesses (Coe et al. 2001; Ho 2002; La Porte et al. 2002; Watson and Mundy 2001). An e-government benchmark of United Nations members underscores with exuberance the potential of e-government for nations of the world.

But perhaps what e-government is ultimately all about is opportunity. Opportunity to transform a public sector organization's commitment so it can function as truly citizen-centric. Opportunity to provide cost effective services to the private sector contributing to the development of business and promoting long-term economic growth. Opportunity to enhance governance through improved access to accurate information and transparent, responsive and democratic institutions. The types of services that can be delivered over the internet are still being conceived, developed and improved by both the public and the private sectors. Over the next few years expect to see a [sic] increased experimentation, innovation, and organizational learning in an effort to perfect e-government. (Ronaghan 2001, p. 6).

At the same time, a growing number of studies indicate that many of these hopes have not been realized, at least not to the extent expected (Hoegler and Schuster 2002; Moon and Bretschneider 2002; Reddick 2004). These studies concluded that e-government has not revolutionized the way government

functions and that governments have not realized the anticipated benefits of cost-savings, improved service delivery, and so forth.

Clearly, the e-government experience varies dramatically from one government to another, both between and within countries, with numerous individual examples of success (Jorgensen and Cable 2002) and of failure (Hoegler and Schuster 2002). Several studies compare countries (Dalziel 2004; Hunter and Jupp 2002; Cap Gemini Ernst & Young 2003; Ronaghan 2001; United Nations 2003); but on the whole, how well *are* governments progressing up the ladder toward e-government maturity and effectiveness? A number of stage models postulate an evolution from a simple web presence and information dissemination function through support for transactions, for e-democracy, and other so-called advanced characteristics (Baum and Di Maio 2000; Layne and Lee 2001; Cap Gemini Ernst & Young 2003; Reddick 2004; Ronaghan 2001; Watson and Mundy 2001). But to what extent are governments moving beyond the simple information dissemination stages to offering support for transactions or transforming the nature of the relationship between citizens and government, through e-democracy (Anttiroiko 2001; Nugent 2001)?

One place to look for answers is in countries that are leaders in information and communications technologies (ICT) and e-government implementation. International surveys place the Scandinavian countries among the more mature in Internet penetration, user experience with IT/IS, and sophistication of e-government services (Dalziel 2004; EIU 2004; Ferrell 2003; Hunter and Jupp 2002; Cap Gemini Ernst & Young 2003; Ronaghan 2001; United Nations 2003).

This study assesses e-government services at the level of local government in southern Norway. In Norway, the municipality is the government level that has the most direct contact with the citizens and businesses and is responsible for providing an array of basic services. In recent years the municipalities throughout Norway have made considerable efforts to establish and refine their on-line presence. In 2003, 96% of the municipalities had their own web site (Statistisk sentralbyrå 2004). Still, the functionality and quality of content vary greatly.

The framework applied in this study is the MeGAP-3 methodology (Kaylor et al. 2001; Public Sphere Information Group 2002). The MeGAP-3 assessment tool was developed to assess the status of municipal e-government implementations in the United States. It supports a more detailed analysis of the depth and breadth of municipal services than any other assessment framework found in the literature. The tool, described below, consists of 68 performance measures identifying the presence and sophistication of a range of on-line services. In the United States, MeGAP-3 has been used to study e-gov-

ernment services of the largest U.S. cities (>100,000 population), and regions surrounding Boston (Massachusetts), St. Louis (Missouri), Minneapolis/St. Paul (Minnesota), and others. We applied MeGAP-3 to thirty municipalities in two neighbouring counties in southern and south-eastern Norway. Known collectively as “Agder,” the counties of East- and West-Agder (Aust-Agder and Vest-Agder) consist of municipalities that represent a broad range of size, wealth, and industry. This paper reports the first attempt to apply an assessment tool designed for U.S. municipal web sites in a Scandinavian setting in order to explore its applicability outside of its original context. Although there are several important challenges to a direct transfer of frameworks and tools across political and cultural settings, a common assessment tool can increase the ability to benchmark diverse government web sites and transfer knowledge internationally.

The results show large variations in the range and sophistication of the municipal web content. Overall, the sophistication of the web sites was not as high as initially expected. A series of qualitative interviews were conducted to elaborate on the reasons for the diverse quality of the different municipal web sites. In particular, we were interested in understanding the driving motivations behind web site development and their role in determining a municipality’s MeGAP-3 score, which is a function of the depth and breadth of services provided. From the interviews, we were able to identify two distinct approaches to the e-government efforts. The first approach was driven by the administration’s desire to cut costs and deliver services more efficiently. The second approach was motivated by a desire to provide added value to the customers of the municipalities. Of the two approaches, the first proved to be the more common in the municipalities in which we conducted interviews. It is difficult to predict the result of following either of the approaches; however, the outcomes of these different strategies warrant additional research.

1.1 Measuring E-Government

There is no shortage of interest in assessing e-government efforts. Studies commissioned by the United Nations, the European Union, individual countries, private consulting companies, and individual researchers have mushroomed in recent years (Center for Administrative Innovation 2004; Radford and Holmes 1999; Hunter and Jupp 2002; norge.no 2004; Cap Gemini Ernst & Young 2003; Ronaghan 2001; West 2003a; b). In each case, policy-makers, government officials, researchers, and others seek to learn lessons from other governments’ e-government policies, measure e-government progress relative to other governments, identify and learn from best practices, discover global

trends and measure underlying e-government concepts to identify points of leverage (Janssen et al. 2004). Often e-government is assessed through the use of an index or benchmark which yields some sort of score that can be used to rank governments against each other, or with themselves over time. The temptation to misuse or over-generalize such indexes is great. Statements like “country X ranks #3 while country Y ranks #7” or “country Z moved up from #12 in 2002 to #7 in 2004” are superficially satisfying, but by themselves lack meaning and usefulness. Indexes may suffer from problems with geographic coverage, methodology, bias, or a lack of transparency (ITU Development Report 2003). Properly understanding indexes and their limitations requires an understanding of precisely what it is they do, or do not, measure. Comparing indexes similarly requires care that apples are compared with apples.

Different assessments measure different aspects of e-government. Some studies examine the demand for e-government (Barnes and Vidgen 2004; Gartner Research 2001; Graafland-Essers and Etedgui 2003), while others examine the supply and nature of e-government services (Cap Gemini Ernst & Young 2003). Janssen et al. classified eighteen e-government benchmarking studies into four groups depending on their focus: supply-oriented, demand-oriented, information society orientation and meta-benchmarking (Janssen et al. 2004).

At the same time, studies can differ in their level and unit of analysis. A recent United Nations report (United Nations 2003) examines only the top level government when countries' level of e-government are assessed. An Accenture study also assesses national web sites (Hunter and Jupp 2002). The EU has a systematic evaluation and follow-up of the e-government development in member countries. EU has commissioned a series of E-Government evaluation reports by Cap Gemini Ernst & Young, and their studies are based on 12 government-to-citizen and 8 government-to-business indicators (Cap Gemini Ernst & Young 2003). These studies are not limited to specific levels of government, but examine services, whichever level of government provides them. Several European countries maintain their own internal rankings of, for example, government portals (e.g., the internal Norwegian ranking (norge.no 2004)). Similar efforts are being made in the United States and Canada. West analysed state and national web sites (West 2000). Several studies have benchmarked municipal web sites (Brueckner 2002; Stowers 1999; West 2000; 2003b; Public Sphere Information Group 2002). Some studies examine web sites exclusively (Kaylor et al. 2001), while others examine both front-end and back-end systems alike (Vintar et al. 2003). Still others build indexes from a wide range of indicators, not all of which relate specifically to e-government (ITU Development Report 2003).

Studies also differ in which characteristics of digital provision of services are of interest. Some studies limit themselves to so-called meta characteristics of web sites, focusing on issues of access, navigability, ease-of-use, and other aspects of design (Barnes and Vidgen 2004; Potter 2002; Smith 2001). Other studies focus on content and exclude design considerations. The European Commission has defined 23 indicators to monitor the progress and success of the E-Europe program (eEurope 2001). Other studies employ a mix of indicators. A survey of Norwegian public web sites evaluates quality and content in three dimensions: accessibility for all, user interface and useful content of information and services (norge.no 2004). The instrument focuses primarily on design quality; content is evaluated only at aggregate levels.

While researchers may in the future develop a unified theory that dominates the theoretical landscape of e-government, we contend that at present it is appropriate that there exist a multitude of studies examining a variety of levels and units of analysis, geographic regions, definitions of e-government, web site characteristics, and so forth in numerous combinations and permutations. One should not expect that one study can do the work of another, or that a lack of comparability between two studies implies a lack of compatibility.

Another legitimate question is the extent to which studies that focus on assessing web sites in the private sector context (e.g., TAM (Technology Acceptance Model), (Davis 1989), WebQual (Barnes and Vidgen 2001; 2003), WEBQUAL™ (Loiacono et al. 2002) and EWAM (Extended Web Assessment Method,) (Schubert 2002) may yield insights in the public sector context. A key distinction associated with the private/public contrast is the purpose of the organizations. Whereas private sector organizations mainly exist to generate profit, public organizations have a moral or legal responsibility to provide a set of basic services to all their constituents. Hence, a public agency cannot choose its customers, but rather has a duty to ensure full access to all services by everyone (Adams et al. 2003). A consequence of such sectoral distinctions has been that insights from the private sector cannot automatically be applied to the public sector. Difficulties in translating prescriptions developed for the private sector to a public sector context have been reported both from the information systems and the strategic planning literature. According to Kaylor et al. the corporate model for benchmarking web-enabled delivery of services is engaged in the same struggle as cities (Kaylor et al. 2001). For the most part, performance standards refer to organizational and content-related matters or to ex post facto measures of performance, such as counting web site visitors (hit counts). Similarly, research on the effectiveness of e-government efforts to date often has content analysis or measures of usage. Bretschneider studied differences between management information systems and public manage-

ment information systems and found that public and private organizations operate in different environments, which influence the management of computers and hence information (Bretschneider 1990). Kaplan and Norton attempted to implement their balanced scorecard in public sector organizations, but found that the sectoral differences inhibited the scorecard from providing the same value in public organizations as in private (Kaplan and Norton 2001). As a consequence they developed a revised version of the scorecard, particularly suited to fit public sector and NGOs.

A number of web site assessment indicators developed for the private sector may be useful for assessing local government web sites. Typically, indicators assessing usability and general design principles are thought to be equally valid in both sectors. On the other hand, both the number of available services and the nature of the services provided differ significantly between government web sites and business web sites. Whereas businesses typically provide a small number of services targeted at defined customer groups, government agencies are expected to provide a range of services targeted at all citizens. Also, while businesses typically aim at profit maximization, government agencies are budget optimizing, aiming at providing the best possible service within the possibilities of existing budgets. Hence, neglecting to assess the actual amount of on-line services can lead to incomplete assessments generating only parts of the data necessary for benchmarking and comparing local government web sites.

The current study makes a unique contribution to the rich diversity of e-government studies by examining the supply of e-government services through municipal web sites in the Agder region of Norway. As described below, the study examines in detail the breadth and depth of services provided on these municipalities' web sites. While other studies have focused on Norwegian municipalities (norge.no 2004) or examined in depth the supply of e-government services within municipalities (Public Sphere Information Group 2005; Public Sphere Information Group 2002), none has done both.

1.2 The Norwegian System of Local Government

Since the ratification of the Norwegian constitution in 1814, Norway has been governed as a social democracy with a parliamentary system of government. Government functions are distributed across three layers: the central government, the regional government and the local government. To ensure equity and democracy in a geographically stretched and sparsely populated country, each of the layers is further divided into several units to address the multitude of

government responsibilities. The local government has the greatest direct contact with citizens.

Today Norway is divided into 434 local government units, the municipalities, organized within 19 regions. The municipalities differ in population from less than one thousand to several hundred thousand. As in the county, the municipality is governed by a body of elected politicians (the municipal council) and an administration of bureaucrats. The mayor is the top representative and leads the meetings of the council. The main tasks of the council are to allocate funds to municipal initiatives and to approve budgets, plans, loans, and the buying and selling of property. The council appoints committees for municipal purposes or to handle parts of the municipal operation. These committees are granted decision authority according to Norwegian law.

The bureaucratic administration is headed by the Chief Administration Officer (*Rådmann*). Below him or her are a number of municipal offices, e.g. Health care, School, Social Security and Technical (fire department, waste management). These offices have responsibility for the day-to-day running of the municipality.

The municipality is funded by local taxes and state funding. However, the size of state funding is decreasing, forcing the municipalities to become more efficient in their operations. At the same time, the state is presenting government reform programs aiming at improving service quality and the availability of service to citizens and businesses.

To meet the demand for improvement and concurrently cope with limited resources, the municipalities have undertaken several initiatives to reorganize their operations. A key factor in this reform process has been e-government: the use of ICT (particularly the Internet) to improve information dissemination and service provision and provide a more open and available local government. Still, the deployment of e-government bears considerable initial costs. These costs may be justified in large municipalities, but are more difficult to gain acceptance for in the smaller communities. As a consequence, a number of municipalities collaborate to share initial development costs.

1.3 Research Questions

In light of the above discussion, we focus our investigation on three principal research questions:

1. What is the state of e-government at the municipal level in the Agder counties? To what extent have Agder municipalities implemented the

more sophisticated e-government functions and services: e-commerce and e-democracy?

2. How well suited is the MeGAP-3 assessment tool to assessing municipal web sites in the Norwegian context?
3. What factors shape the development of municipal e-government solutions? If differences exist, what explains them?

While international comparisons often examine top-level government web sites, research question one focuses on local government web sites in a Norwegian region. This will provide insights on the sophistication of local government web sites, where the majority of interaction between government and civil society occurs. Insights from local e-government can also provide corrections to national benchmarking initiatives.

We have shown that current e-government assessment frameworks either focus on prerequisites for e-government (United Nations 2003), design quality (norge.no 2004) or a small selection of comparable services (Cap Gemini Ernst & Young 2003). The MeGAP-3 framework puts emphasis on on-line service provision. Research question two allows for a discussion of the usefulness of applying an assessment framework like MeGAP-3 in a context other than that for which it was designed.

A few studies describe factors that influence the shaping of municipal e-government development (Henriksen 2004; Ho 2002; Kim 2001; Lowe 2003; Moon 2002; Prattipati 2003; United Nations 2003). These studies differ greatly in the sets of factors identified and provide no coherent overall picture. Consequently, we took a qualitative, exploratory approach with research question three to probe the issue of how differences between local governments within a region can be explained.

2 Methodology

This section presents the e-government assessment methodology and our application of it. We further present the complementary qualitative methods used.

2.1 MeGAP-3 Methodology

To evaluate municipal web sites in Adder, we applied the MeGAP-3 assessment tool to each. The Municipal E-Government Assessment Project (MeGAP) began as an effort to provide guidance to cities and communities as

planners thought strategically about e-government implementation (Kaylor et al. 2001). These efforts, undertaken by Charles Kaylor at the University of Michigan and later at the Public Sphere Information Group (PSI Group), sought to identify the leading edge of municipal e-government implementations by assessing the functions and services that municipalities were providing in a web-enabled form. By design, the assessment looks at the manner in which a function or service is provided on the web but does not evaluate the generic quality of the web site (e.g. navigability, quality, style) or extent of use by end users.

The third version of the MeGAP (MeGAP-3), used in this study, assesses 68 distinct web *performance dimensions* grouped into four categories (see Appendix):

1. Information dissemination (e.g., city codes, official minutes, traffic information, municipal government directory)
2. Interactive functions (e.g., bidder applications, downloadable forms, building permit process, business license)
3. E-Commerce functions (e.g., utilities payment, property tax look-up and payment, code enforcement)
4. E-Democracy (e.g., e-meetings, e-forums, user customization, volunteer opportunities)

For a given municipality, each of the 68 performance dimensions is scored on a 1-4 scale, which indicates the degree of interactivity or completeness of the web implementation of the dimension. This scoring corresponds roughly to the stage model concepts used in many other assessments (Baum and Di Maio 2000; Hunter and Jupp 2002; Layne and Lee 2001; Cap Gemini Ernst & Young 2003; Ronaghan 2001), though it applies at the function level rather than at the government level. The four non-zero scores are:

1. Information about a given function or service exists on the web site. This score indicates that the web site contains a reference to a function or service, or that the function or service exists in a very limited and incomplete form. For example, a web site might identify an economic development office and indicate its mission, but provide minimal concrete information about economic development plans or opportunities for participation in the planning process.
2. A link to a relevant contact (e.g., phone, e-mail) or substantially complete information exists on the web site. In this case, the web site would provide contact information for the economic development office, extensive information about plans and processes, or both.

3. Downloadable forms or other support for submitting information to the municipality exist. The key thought behind a score of '3' is that the web site offers the user a means of submitting information to the municipality that is more than just e-mail. The most common means of gaining a score of '3' is to offer electronic versions of paper forms that can be downloaded, filled out, and submitted electronically or physically to the municipality. Electronic forms used simply to collect information also fall into this category. For example, a web site might offer downloadable forms for applying for economic development funding. This score is comparable to the 'active/passive' level in (Hunter and Jupp 2002) in which the user is able to interact with the web site, but the government role is passive.
4. Transaction or other interaction can take place completely on-line. The highest form of interactivity involves a complete transaction in which user input causes some change or response on the part of the municipality's information system. Continuing our example, a web site might return to the user a dynamically generated application identifier that the user could subsequently use to look up on-line the status of his application. Users might also be able to query for economic development information using a variety of criteria.

In addition to the 68 performance dimensions, MeGAP-3 includes nine evaluative criteria (e.g. presence of advertising, support for multiple languages, stated privacy policy), which are evaluated on a 0-1 scale.

The scores for the 68 performance dimensions and nine evaluative criteria are added to obtain a single *e-score*. The *e-score* provides one way of quantifying the extent to which a municipality has web-enabled its interface to its citizens. *E-scores* offer a means of comparing the progress of multiple municipalities at the same point in time, or of the same municipality at multiple points in time. A detailed comparison of the performance dimensions that constitute the *e-scores* can offer individual municipalities insight into how they compare with their peers in particular functional areas and suggest opportunities for improving or expanding services and functions through electronic means (Kaylor et al. 2004; Public Sphere Information Group 2005).

The MeGAP-3 performance dimensions were developed by studying municipal functions in web sites in the United States. The framework was developed more out of a pragmatic desire to identify the leading edge of e-government implementation than out of theoretical considerations. While many assessment frameworks use a relatively sparse set of indicators (e.g., the EU assessment with 12 government-to-citizen (G2C) indicators) in the interests of simplicity and comparability across regions, we felt that the more

extensive list of functions of MeGAP-3 could provide deeper insight into the nature of municipal e-government than could other assessment frameworks. In spite of the lack of a firm theoretical foundation in MeGAP-3, we therefore decided to base our study on this framework, recognizing that our study is but a first step towards a more comprehensive and theoretically grounded investigation of municipal e-government in Norway and elsewhere.

2.2 Application of MeGAP-3

We decided to use the MeGAP-3 assessment exactly as it was developed by the PSI Group. First, we wanted to determine the extent to which an instrument—developed to analyse American municipalities—could be used successfully in a non-American context. We did not make the assumption that MeGAP-3 was perfectly suited to the Norwegian context. Rather, we felt that using the instrument as-is would provide insight into how the instrument might have to be adapted to a non-American context in later research. Second, if the instrument proved useful, it could provide a better basis for comparing American and Norwegian municipalities than would two non-identical instruments.

Between December 2003 and April 2004 we applied MeGAP-3 to the 15 municipalities in Vest-Agder and the 15 in Aust-Agder. To increase the comparability of Agder *e-scores* with those done by the PSI Group, we independently evaluated a number of American municipalities. This set, chosen by the PSI Group, included American municipalities representing a broad range of *e-scores*. The PSI Group compared these *e-scores* with its own and found them to be consistent.

2.3 Qualitative Methods

While *e-scores* provide a basis for comparing municipalities, they provide no insight into why municipalities develop web sites in the way that they do. To understand the process of web site development and the factors that affect the implementation of this or that function or service on a municipal web site we conducted a set of semi-structured interviews with the IT managers of individual municipalities. Six municipalities were selected, such that they had a large variation in *e-scores* with approximately the same population. Three of these municipalities had recently merged their IT service functions, while the strategic decisions about e-government were still taken locally. Both the IT-manager of the largest of the three municipalities and the manager of the merged IT service were interviewed. The interviewees were also asked to comment on

the results from the MeGAP-3 assessment based on their own intuitive understanding of which municipalities were ahead of which in online service delivery, thus providing a reality check on the assessment.

3 Results

This section presents the result of the e-government assessments and the interviews. First, we present a comparison of e-scores, then the frequencies of functions among municipalities and an overview of interactivity functions that have been implemented. Finally, we present findings from interviews with key information technology managers.

3.1 E-Score Comparisons

Figure 1 shows a comparison of *e-scores* of the 15 Vest-Agder and 15 Aust-Agder municipalities. The figure uses a logarithmic scale along the X-axis to reflect population, which ranges from 848 (Bykle in Aust-Agder) to 74,590 (Kristiansand in Vest-Agder) (Statistical Yearbook 2003). The average *e-score* for Vest-Agder municipalities is 32.1; for Aust-Agder, 37.5. A T-test indicates that we cannot claim a statistical difference between the mean *e-scores* of the two counties ($t(28)=-.59$, $p=.56$). Municipalities received an *e-score* of 0 if they had no web site at all (two municipalities) or had a single web page indicating that the web site was currently under construction or closed for renovation (two municipalities).

Figure 1 reveals a number of important points. While e-scores of Agder municipalities are linearly correlated with population at a .05 confidence level ($F(1,28) = 7.23$ $p=.012$), population explains only a small amount of e-score variance ($R^2=.21$). It is not necessarily the case that the most populous municipalities, and presumably those with the largest IT expenditures or the greatest need to offer services and functions to large and diverse populations, have the most extensive e-government solutions, as measured by this instrument. Municipalities with fewer than 1000 inhabitants, such as Bykle and Åseral, have e-scores comparable to municipalities an order of magnitude more populous. At the same time, municipalities with similar population—such as Tvedestrand, Kvinesdal, and Farsund—have very different e-scores. Clearly, the principal explanation for differences in e-scores does not lie in population figures. We should note that on an international scale, the population sizes of Agder municipalities are all clustered towards the small end of the scale. The

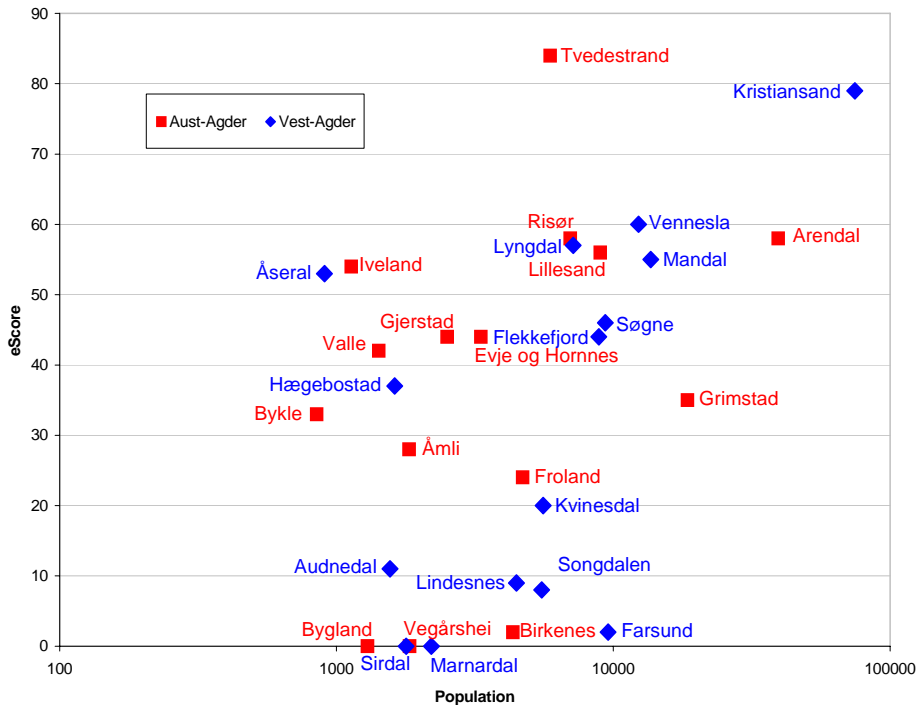


Figure 1. E-Scores of Agder Municipalities (April 2004)

most populous municipality in our study, Kristiansand, has only 75,000 inhabitants. Studies of population and e-scores that include larger municipalities may yield different results.

The four MeGAP performance dimension categories (information dissemination, interactive functions, e-commerce, and e-democracy) reflect a progression of citizen engagement with the government. Table 1 shows that in comparison with the proportion of *e-score* points allocated to each category in MeGAP-3, the Agder municipalities obtain disproportionately many points in the interactive functions category, and disproportionately few in the e-commerce and e-democracy categories. The Agder municipalities, on average, emphasize less sophisticated levels of citizen engagement through e-government services. Since we are using MeGAP-3 as a first step towards a more comprehensive framework, we refrain from drawing firmer conclusions. In particular, we have not taken into account the relative importance of the functions to the citizens. However, the low relative average scores indicate that much of the potential of e-government has not been tapped.

	<i>Info. dissemination</i>	<i>Interactive functions</i>	<i>E-Commerce</i>	<i>E-Democracy</i>	<i>Evaluative criteria</i>	<i>Total</i>
Average (East-Agder)	12.9 (29%)	24.1 (55%)	3.1 (7%)	3.8 (9%)	1.8 (4%)	43.9
Average (West-Agder)	13.5 (32%)	20.8 (49%)	3.9 (9%)	4.0 (9%)	1.8 (4%)	42.2
Average (Total)	13.2 (31%)	22.5 (52%)	3.5 (8%)	3.9 (9%)	1.8 (4%)	43.1
MeGAP-3 (max score possible)	84 (30%)	112 (40%)	32 (11%)	44 (16%)	9 (3%)	281.0

Table 1: Portion of e-score Contributed by Each Function Category

The data also show some limitations of the *e-score* as a means of comparing municipalities. Table 2 compares the municipalities having the ten highest e-scores. The *e-score* measures both depth and breadth of services, but combines these measures in a way that makes it impossible to distinguish between those municipalities that have chosen to emphasize breadth vs. those that emphasize depth. The top two municipalities, Tvedestrand and Kristiansand, illustrate these two approaches. While both municipalities have comparable e-scores, Kristiansand has a third more functions scoring 3 or 4 than Tvedestrand. On the other hand, Tvedestrand has a third more functions scoring 1 or 2 than Kristiansand. Kristiansand has chosen to emphasize depth of functionality; Tvedestrand, breadth. Consequently, the function scores for Tvedestrand lie closer to the mean, yielding a lower coefficient of variance (114%) than for Kristiansand (127%).

Figure 1 yields insights of more local interest. Nearly all municipalities have made non-trivial efforts to offer web-based information, services, and functions to their inhabitants. Only six municipalities did not have some form of functional web site. Of these, three were undertaking major web site development or renovation efforts at the time of evaluation, and we will soon see major increases in their *e-scores*. That 90% of the municipalities have, or will shortly have, a substantial web presence is consistent with Norway's high ranking in many IT-readiness assessments (ITU Development Report 2003).

The two Agder regions, Aust-Agder and Vest-Agder, enjoy a friendly rivalry. Together, they constitute most of Southern Norway (called *Soerlandet*) and share a great deal of culture, history, and common interests. Currently,

Municipality	e-score	Number of functions with a score of					Mean	St. Dev	Coefficient of Variance
		0	1	2	3	4			
Tvedestrand	80	35	2	19	8	4	1.18	1.34	114%
Kristiansand	76	38	5	9	11	5	1.12	1.42	127%
Vennesla	58	44	4	10	6	4	0.85	1.30	152%
Arendal	56	44	3	14	3	4	0.82	1.25	151%
Risoer	56	42	7	11	5	3	0.82	1.21	147%
Lillesand	54	43	9	7	5	4	0.79	1.24	156%
Lyngdal	54	47	3	5	11	2	0.79	1.29	162%
Mandal	53	48	4	3	9	4	0.78	1.34	171%
Iveland	52	45	4	12	4	3	0.76	1.20	157%
Aaseral	51	46	3	10	8	1	0.75	1.18	157%

Table 2: Breakdown of Top-10 Agder e-scores

there are ongoing initiatives to merge the two regions into one and a merger is possible in the not too distant future. At the same time, each region contains both coastal and mountain municipalities, large and small, rich and poor. A small difference exists in average *e-scores* of the two regions, with Aust-Agder enjoying a small (37.4 vs. 32.1) edge over Vest-Agder. However, Figure 1 shows that the two regions are, on the whole, very comparable. Each has municipalities across the *e-score* spectrum in each size category.

But what do the *e-scores* tell us about the overall level of sophistication of municipal e-government solutions? How advanced are these web sites? Which functions are widespread? Which are rare? To what extent have the municipalities embraced solutions that fall into the e-commerce or e-democracy categories? We can begin to answer these questions by examining the frequency with which individual functions are supported on municipalities' web sites and the categories within which these functions fall.

3.2 Function Frequency Among Municipalities

Tables 3-6 list the MeGAP-3 functions and the number of municipalities supporting that function. The percentage figures reflect a percentage of the maximum value for the columns (15 for each of the two counties and 30 for the

total). Table 3 lists the most widespread MeGAP-3 functions, those that are supported by at least half of the municipalities' web sites.

<i>Function</i>	<i>Function Category</i>	<i>Aust-Agder county</i>		<i>Vest-Agder county</i>		<i>Total county</i>	
		N	%	N	%	N	%
Community services	Interactive functions	13	87%	12	80%	25	83%
Education	Info.dissemination	13	87%	12	80%	25	83%
Public health	Interactive functions	12	80%	11	73%	23	77%
Job applications	Interactive functions	12	80%	9	60%	21	70%
Demographic information	Info. dissemination	10	67%	10	67%	20	67%
Down load able forms	Interactive functions	11	73%	9	60%	20	67%
Minutes of meetings	Info. dissemination	11	73%	8	53%	19	63%
Building permit process	Interactive functions	11	73%	7	47%	18	60%
Building permit fees	E-Commerce	11	73%	6	40%	17	57%
Search engine	Interactive functions	10	67%	7	47%	17	57%
Searchable directory	Info. dissemination	11	73%	5	33%	16	53%
Strategic plan	Info. dissemination	9	60%	6	40%	15	50%

Table 3: Most common MeGAP-3 functions in Agder

Of the 12 functions listed in table 3, six fall in the interactive functions category, five fall in the information dissemination category, one falls in the e-commerce category, and none falls in the e-democracy category. In other words, the most common functions concentrate on informing the populace and enabling inhabitants at least to begin some interaction with the municipality.

Not surprisingly, the three most common functions reflect the three principal areas of municipality responsibility: services provided to inhabitants (all active web sites include at least a description of the range of services provided to the community), public schools, and public healthcare. The high frequency of functions related to building permits similarly reflects a major area of municipality responsibility and a common area of interaction between inhabitants and authorities.

Table 4 lists functions found on the web sites of 15-50% of municipalities. These moderately common MeGAP-3 functions are, like the most common, dominated by information dissemination and interactive functions. Of the 19 functions listed, only two are from the e-commerce category and only one is

from the e-democracy category. Conversation forums, found on 20% of Agder municipal web sites, are the most common example of an e-democracy function, as defined by MeGAP-3.

Function	Function Category	Aust-Agder county		Vest-Agder county		Total county	
		N	%	N	%	N	%
Solid waste	Info. dissemination	8	53%	6	40%	14	47%
Document management system	Interactive functions	7	47%	6	40%	13	43%
On-line GIS	Interactive functions	8	53%	4	27%	12	40%
Facility reservation	Interactive functions	6	40%	4	27%	10	33%
Recycling	Info. dissemination	5	33%	5	33%	10	33%
Schedules (hours)	Info. dissemination	3	20%	7	47%	10	33%
Info for businesses	Interactive functions	6	40%	3	20%	9	30%
Parking permit	Interactive functions	4	27%	5	33%	9	30%
Property taxes lookup/payment	E-Commerce	5	33%	4	27%	9	30%
Business license	Interactive functions	4	27%	4	27%	8	27%
Economic development	Interactive functions	5	33%	3	20%	8	27%
Transportation	Info. dissemination	5	33%	3	20%	8	27%
Housing	Interactive functions	5	33%	2	13%	7	23%
Zoning lookup	Interactive functions	4	27%	3	20%	7	23%
Conversation forums	E-Democracy	4	27%	2	13%	6	20%
Plat maps	Info. dissemination	1	7%	5	33%	6	20%
Street vendor license	Interactive functions	4	27%	2	13%	6	20%
Action requests (Complaints)	Interactive functions	3	20%	2	13%	5	17%

Table 4: Moderately Common MeGAP-3 Functions in Agder

Table 4 offers other potentially noteworthy items. The document management systems function, found on nearly half (13) of Agder municipal web sites, is, in most cases, the web manifestation of case document management software. While municipalities differ in the degree to which they have imple-

mented dynamic links between their web sites and their back-end systems, all are required by law to use computer-based systems for managing the formal case documents used to track issues, discussion, and decisions made by the authorities. Supporting inhabitants' ability to monitor and track case documents relevant to their own lives (e.g., a community decision on a new highway or their appeal for an exemption from a zoning regulation) can be a very powerful feature of municipal web sites. Our expectation is that the number of municipalities supporting this function in highly interactive and dynamic ways will grow quickly in the coming years.

Nearly half (12) of the web sites support some kind of on-line geographic information system (GIS) functionality. Even some of the smallest municipalities such as Iveland (population 1131), employ GIS on their web site. Clearly, small municipalities are unlikely to have the wherewithal to implement their own GIS systems. Instead, many municipalities have joined together with other municipalities in their area to implement a GIS solution jointly. Employing commercial GIS software and using state cartographic data as a foundation, they have implemented a single web site, linked to from individual municipality sites, in which geographic data from the region is displayed. Via menu options, users are able to view individual municipality data. GIS systems are one example of inter-municipality cooperation in IT, a strong trend in the Agder region.

Also noteworthy in table 4 is the fact that less than one-third (9) of municipalities have explicit support for, or development of, commercial business. Why so few municipalities use their web sites as a mechanism for encouraging economic activity is a complicated question that requires further investigation.

Table 5 lists functions found on few (1-15%) of Agder municipal web sites. The bulk of e-commerce (4) and e-democracy (3) functions implemented at all fall in this table. Again, information dissemination and interactive functions predominate.

The low frequency of many of these functions can be explained in a number of ways. Some functions are of little practical value for Agder municipalities that are small, e.g. live traffic/web cams and virtual city tour. Other functions are not as clearly municipality responsibility in Norway as they are in the United States, e.g. voter registration and utilities payment. Most payments in Norway take place through account-to-account funds transfers rather than via credit-cards or checks. The account-to-account transfers are executed via on-line banking systems or at bank branch offices. As a result, there is little need for municipalities to support their own on-line payment infrastructure. For other functions, e.g. budget reports, bidder applications, or city charter,

there is no obvious reason for the low frequency other than that these functions are not perceived as important for a municipality web site.

Function	Function Category	Aust-Agder county		Vest-Agder county		Total county	
		N	%	N	%	N	%
Budget report	Info.dissemination	3	20%	1	7%	4	13%
Comprehensive planning process	Interactive functions	3	20%	1	7%	4	13%
Emergency management	Info. dissemination	4	27%	0	0%	4	13%
Live traffic/web cams	Info. dissemination	1	7%	3	20%	4	13%
Directions to offices/facilities	Info.dissemination	0	0%	3	20%	3	10%
Utilities Payment	E-Commerce	1	7%	2	13%	3	10%
Bidder applications	Interactive functions	1	7%	1	7%	2	7%
City charter	Info. dissemination	1	7%	1	7%	2	7%
City code	Info. dissemination	1	7%	1	7%	2	7%
Fines	E-Commerce	0	0%	2	13%	2	7%
Information requests	E-Commerce	0	0%	2	13%	2	7%
Recreation/class registration	Interactive functions	1	7%	1	7%	2	7%
User customization	E-Democracy	2	13%	0	0%	2	7%
Volunteer opportunities	E-Democracy	1	7%	1	7%	2	7%
AS-Built images	Info. dissemination	1	7%	0	0%	1	3%
Bids on-line	Interactive functions	0	0%	1	7%	1	3%
Info for employees	Info. dissemination	1	7%	0	0%	1	3%
Pet	Interactive functions	0	0%	1	7%	1	3%
Scheduled e-meetings	E-Democracy	0	0%	1	7%	1	3%
Utility start/stop	E-Commerce	0	0%	1	7%	1	3%
Virtual city tour	Info. dissemination	1	7%	0	0%	1	3%
Voter registration	Interactive functions	0	0%	1	7%	1	3%

Table 5: Uncommon MeGAP-3 Functions in Agder

A considerable number of MeGAP-3 functions have been implemented by no Agder municipality at all. These are listed in table 6.

In contrast to tables 3-5, e-democracy functions dominate in table 6. The implications of this fact will be taken up in the discussion section.

<i>Function</i>	<i>Function Category</i>
Bike permit/info	Interactive functions
Code enforcement	E-Commerce
Food inspection & safety	Interactive functions
Listservs	E-Democracy
Neighborhood specific Info	E-Democracy
On-line surveys/polls	E-Democracy
Participation opportunities	E-Democracy
Real-time traffic info	Info. dissemination
Road closure/detour	Info. dissemination
Streaming audio of meetings	E-Democracy
Streaming video of city Council Meetings	E-Democracy
Taxi license	Interactive functions
Temporary use permit	Interactive functions
Visualization/consultation technologies	E-Democracy
Vital records	Interactive functions

Table 6: MeGAP-3 Functions Not Found in Agder

3.3 Interactivity of Function Implementations

For each municipality, the MeGAP-3 functions are scored on a scale of 1-4 reflecting varying degrees of interactivity supported by the web site. While Tables 3-6 tell us how many municipalities have *some* implementation of a particular function (perhaps just a brief mention on the web site), they do not indicate the sophistication or depth of interactivity of this implementation. Which functions have been implemented in a relatively sophisticated, interactive form and how widespread are such implementations?

Table 7 lists the functions for which at least one municipality was scored at level 4. For each such function, the number of municipalities scoring 4 is shown. A score of 4 indicates that the function's implementation supports strong, or two-way, interactivity, in which the system responds in a dynamic

way to user input, such as by executing a transaction or dynamically generating output in light of the users input.

Function Category	Function	Number of Municipalities	
		N	%
Interactive functions	Search engine	16	53%
Interactive functions	Online GIS	8	27%
Interactive functions	Zoning lookup	5	17%
Info. dissemination	Searchable directory	5	17%
E-Democracy	Conversation forums	3	10%
Interactive functions	Action requests (complaints)	2	7%
Info. dissemination	Plat maps	2	7%
E-Commerce	Property taxes lookup/payment	1	3%
E-Democracy	User customization	1	3%

Table 7: Number of municipalities rated at level 4 on individual functions

Table 7 shows that only nine of the 68 MeGAP-3 functions have been implemented in Agder at a level 4. Of these, only two have been implemented by more than 17% of the municipalities; and neither of these two, search engines or online GIS, reflects sophisticated, home-grown functionality. Such functionality is provided by scripts or software packages purchased from third parties. Only 10% of the municipalities have implemented strong, interactive support for e-democracy functions, with conversation forums being the principal example. Only one municipality, Lillesand, had at the time of investigation implemented a user-customizable web site on which users could log in and see items of direct interest to them, such as their own applications, or documents related to cases relevant to them.

In short, while over half (17) of the Agder municipalities have at least one example of support for strong, two-way interactivity on their web site, such functionality is not routine or commonplace.

Not surprisingly, many more municipalities have implemented support for weaker, one-way interactivity. By far the most common way to achieve a score of 3 for a function is by supplying forms on the web site that can be downloaded by the user and submitted later by post or e-mail.

Table 8 lists the 22 functions for which at least one municipality was scored at level 3, reflecting one-way interaction. The most common MeGAP-3 function listed here, downloadable forms, is supported by 19 municipalities indicating that fully a third of Agder municipalities do not support even this easy-to-implement function. The next most frequent functions—education,

community services, and building permits—are all areas of strong municipal responsibility and activity.

<i>Function Category</i>	<i>Function</i>	<i>Number of Municipalities</i>	
		N	%
Interactive functions	Downloadable forms	19	63%
Info. dissemination	Education	16	53%
Interactive functions	Community services	11	37%
Interactive functions	Building permit process	10	33%
Interactive functions	Job applications	8	27%
Interactive functions	Public health	6	20%
Info. dissemination	Minutes of meetings	5	17%
Interactive functions	Business license	4	13%
Info. dissemination	Strategic plan	4	13%
Interactive functions	Action requests (complaints)	3	20%
Interactive functions	Document management system	3	20%
Interactive functions	Facility reservation	3	20%
Interactive functions	Parking permit	3	20%
Interactive functions	Street vendor license	2	13%
Info. dissemination	Solid waste	2	13%
Info. dissemination	Transportation	2	13%
Interactive functions	Housing	1	7%
Interactive functions	Recreation/class registration	1	7%
Info. dissemination	City Code	1	7%
Info. dissemination	Live traffic/web cams	1	7%
E-Commerce	Property taxes lookup/payment	1	7%
E-Commerce	Utility start/stop	1	7%

Table 8: Number of municipalities rated at level 3 on individual functions

Only two e-commerce functions and no e-democracy functions are supported at level 3. Overwhelmingly, Agder municipalities emphasize the dissemination of information and support for basic, document-based interaction (appli-

cations and reporting in particular) over more complex e-commerce and e-democracy functions.

3.4 Motivation and Driving Factors of E-Government Development

To understand the development of Agder e-government solutions and explore reasons for differences between municipalities, we interviewed IT managers from six municipalities, of which three (M3-M5) shared a common IT-staff. The portion of the municipalities' *e-score* contributed by each of the four main function categories is shown in table 9. Because the evaluative criteria scores have been left out of the table, the category scores shown here do not sum to exactly the *e-score* shown in figure 1, in part to avoid identifying the municipalities specifically. A key observation in this table is that the municipality with the highest *e-score* (M6) is not the municipality with the highest score in the more sophisticated e-commerce (M1) or e-democracy (M2) categories. M6 earned its high *e-score* through extensive provision of information dissemination and interactive function categories, not through unusually high levels of e-commerce or e-democracy functions.

Municipality	Info. Dissemination	Interactive Functions	E-Commerce	E-Democracy
M1	26	34	10	6
M2	15	27	4	8
M3	10	19	4	0
M4	15	41	0	0
M5	11	10	2	0
M6	25	47	6	2
Average (Aust-Agder)	12.9	24.1	3.1	3.8
Average (Vest-Agder)	13.5	20.8	3.9	4

Table 9: Portion of e-score Contributed by Each Function Category

Key motivations and driving factors identified during these interviews are presented in Table 10. Within this group, we were particularly interested in

any factors distinguishing M6, which had the highest *e-score*, from the others, which had varying, but lower, *e-scores*. M3-M5 was covered by a single respondent, the manager of a standalone company providing IT-service to 3 municipalities. These municipalities had recently merged their IT-functions resulting in this new company.

We found evidence supporting two distinct motivations for developing e-government among the interviewed municipalities. In the municipality (M6) with the highest *e-score* among the selected municipalities, the interviewee specified citizen utility as the dominant motivation. For the other five municipalities (M1-M5), the interviewees specified efficiency and cost concerns as the dominant motivation. Very little focus had been on citizen utility. One of the CIOs (Chief Information Officer) put it this way: *I knew what I wanted: replicate data internally to the Net and remove double registration.*

Another difference between municipality M6 and the others was that M6 had implemented a commercially available web portal system while the others either built the web sites themselves or hired a web development firm to do so. The CIO had for several years had good communication with a sales agent from the systems provider. This had developed the CIO's awareness about the range of possible functions, which led to the implementation of many citizen-centric functions. This system was, however, not well integrated with back-office applications. The other five municipalities, M1-M5, prioritized the integration between back-office systems and the e-government front-end systems in their development strategies. This was done primarily for a select few functions that would yield the highest efficiency rewards. These five municipalities had implemented important systems integration that does not show up directly in the *e-score*, but this will unquestionably be a foundation for the implementation of further functionality. In this respect these municipalities may have more sophisticated e-government systems than the *e-scores* show. According to respondent M6, there are approximately 50 sector applications running in an average municipality compared to 3-4 in a private company. This implies a challenge in the integration of the sector applications and the e-government front end.

Another factor that appears to play a significant role is joint IT efforts among municipalities. There is widespread informal cooperation on IT strategy between municipalities in the two Agder counties. The largest two municipalities launched their e-government projects independently, while the remaining municipalities in the two counties were involved in some kind of cooperation on e-government. For example one inter-municipal cooperation project, DDD (Det Digitale Distriktsagder—The Digital Agder District), involves 18 rural municipalities and the two counties. DDD has been sup-

<i>Respondent</i>	<i>Motivation</i>	<i>Driving force</i>
M1	Costs are the driver, without question!	We (the IT department) took the initiative to move towards e-Government.
M2	Unquestionably, it is effectiveness of operations.	Earlier, the driving force was just the CIO and the development chief she reported to. Now, the Chief Administration Officer (Rådmann) is very engaged and involved.
M3-M5	<p>“Money is important. Money and service. That’s what the owners require. We want the same quality of service, only cheaper.”</p> <p>“... you know the situation with Norwegian municipalities? They have very tight budgets. That is the number one priority, and then you see increased service quality as an effect.”</p>	<p>“For many years the CIO ran the show and the CIO and the CFO were almost identical. Now, fortunately, there is a move towards letting the organization (i.e. the Chief Administration Officer (Rådmann) and his staff) run the development. There are large differences between our owners in how they view ICT. Some are very positive and pro-active, while others are more indifferent and passive.”</p>
M6	<p>“The economic effects have not been our primary concern. The basis for our efforts is more closely linked to the question of how we can provide good service to our citizens.”</p> <p>“To enable the citizens to actually use our web interface, we offer free on-line ICT training to all our citizens.”</p> <p>“We are launching wireless networks in the city to connect different locations. Where others would focus on how to protect the network keep people out, our focus is how we can open up this access so that the public can access it.”</p>	<p>“I guess you can say that we (the IT staff) are the primary drivers. However, we are fortunate enough to work very closely with a member of the administrative staff. We then pump him full of our thoughts on how to use ICT and let him bring the ideas to the administration. This works very well, mainly because of our close personal relationship with this person and the fact that this person is very positive towards ICT as a strategic means.”</p>

Table 10: E-Government Motivations and Driving Forces in Agder

ported by state funding, and focuses on two main tasks: providing broadband to all municipalities at competitive prices and using broadband to improve

efficiency and quality of municipal government. Rural municipalities have generally had a declining population and giving broadband to all citizens has been viewed as important to making these municipalities more attractive locations for young people and companies. Municipality M6 is the only one of the surveyed group that is a member of this project. Moreover, the *e-scores* for the majority of small DDD municipalities were at the level of much larger municipalities. The *e-scores* and the interview results provide quantitative and qualitative evidence that inter-municipality cooperation may be an important factor in the development of electronic services.

4 Discussion

This section discusses the findings in this project. First, we discuss the applicability of the MeGAP-3 methodology to the Norwegian municipal setting. We then discuss in detail the *e-scores* and the results from the interviews, and forward propositions about municipal e-government implementation.

4.1 Use of MeGAP-3 in Norway

Was the MeGAP-3 assessment rubric useful in the Norwegian context? Within the context of what the tool was designed to do, the answer is a qualified 'yes'. At a minimum, the results provide a ranking of municipal web sites. The interviewees indicated that this ranking corresponded with their own, more intuitive, understanding of which municipalities were ahead of which in the provision of e-government solutions. While this does not constitute a formal validation, the tool did at least pass the reality check.

One possibility for cross-country analysis would be to restrict a comparison to those MeGAP-3 services that are relevant in all countries being compared. While some services of great relevance in individual countries would be left out, the maximum possible scores in all countries would be the same.

A more difficult but potentially more meaningful measure would be to create a country-specific MeGAP-3 which could be compared with other country-specific measures. In each country, the MeGAP-3 would be developed using the same process used in the original: a list of services would be derived based on services mandated for each municipality plus best practices observed within the country. Since different countries might have different numbers of services in the measure, comparison would have to be made based on relative scores, such as a percentage of the maximum possible score. We therefore forward the following proposition:

- P1: E-Government assessment tools will have to be tailored to the country-specific contexts, and comparisons will have to be based on relative scores.

Although the MeGAP-3 assessment of Agder municipal web sites proved useful in benchmarking the availability and sophistication of on-line government services, the MeGAP-3 instrument is less equipped to assess the general quality of government web sites, e.g. usability, accessibility and usefulness. Such indicators have been found to be important when assessing web sites in general (Barnes and Vidgen 2001; 2003; Davis 1989; Loiacono et al. 2002; Schubert 2002) and account for the majority of indicators in the annual Norwegian assessment of government web sites (norge.no 2004). We argue that an assessment instrument for government web sites needs to incorporate both an extensive evaluation of on-line service provision and a set of general quality indicators in order to provide accurate benchmarking results. Although some general quality indicators are included in MeGAP-3, the MeGAP-3 instrument could benefit from incorporating more quality indicators from the extensive body of research on this issue.

A further shortcoming of MeGAP-3 is that the classification of functions into categories is rather subjective. For example, it is not clear why 'Code Enforcement' should fall in the 'Electronic Commerce' category. We used MeGAP-3 without alteration, but one should not infer that a MeGAP-3 definition of 'e-commerce' or 'e-democracy' is comparable to that of another study.

4.2 The Focus on Internal Efficiency

The MeGAP-3 assessment of the Agder municipalities showed low presence of services falling into the more sophisticated MeGAP-3 e-commerce and e-democracy categories. This is somewhat surprising, as one could expect that a country like Norway—with a high level of Internet penetration and ICT usage maturity, and an open and egalitarian society—would exhibit strength in these areas. Our interviews provide some explanation: public sector IT-managers are more concerned with carrying out the administration's desire to cut costs and run government operations more efficiently than with supporting e-democracy and other so-called "mature" functionality. But why should this be the case?

Grönlund describes the stakeholders spheres of governance as a spetriangle, consisting of three high-level parties: the professional administration, the elected politicians, and the citizens and businesses (Grönlund 2003). A plausible interpretation of our findings is that the professional administration has

assumed the position of the dominant stakeholder, i.e. this group carries out its strategy without much involvement from the other groups.

In analysing the potential cause of this imbalance, elements of stakeholder theory can serve as an interpretive lens. Investigations of stakeholder relationships and dominance point to three key attributes that determine whether a particular stakeholder group is a dominant or a secondary stakeholder (Mitchell et al. 1997). These attributes are *power*, *legitimacy* and *urgency*. In our interviews we found that administration possesses all three attributes with regard to e-government, whereas the politicians and the citizens only possess two.

Public administration has a mandate to manage the municipality according to the politicians' guidelines. Thus the administration has *legitimacy* in striving for a cost efficient operation. The administration also has a mandate to manage the daily running of the municipality and make decisions as it sees fit. This satisfies the *power* attribute. On the matter of *urgency*, the administration receives decreasing funding from central authorities while being expected to maintain and preferably improve service towards the citizens and businesses. This demand acts as a considerable motivator for cutting costs and streamlining internal operations.

The politicians provide guidelines for the administration and have the power to overrule the decisions made by the administration. Politicians therefore possess the *power* to influence the development of e-government. Designated by the Norwegian constitution as a board of directors for the administration, politicians have *legitimacy* in pressuring the administration to pursue e-government initiatives. The question is, if the politicians have the power and legitimacy to alter the development of e-government to become more citizen centric, why don't they? One answer would be: Why should they? Nobody seems to be pushing them to provide a more citizen-centric mode of governance. They may want to reform government but at the same time that could mean their own powers would decrease. If transparency and democracy improved, their roles could be altered. Another reason for maintaining the status quo could be that the politicians agree with the argument that the administration needs to cut costs and therefore give their silent approval for using ICT to improve efficiency rather than add value to citizens and businesses. Drawing from this we conclude that *urgency* is not a current attribute of this stakeholder group.

Citizens elect politicians every four years. That the politicians should be responsive to popular opinion is a basic principle of any democracy. This means that citizens and businesses have considerable *power* over the politicians. For the same reasons it would be perfectly *legitimate* for the constitu-

ents to execute this power. Still, citizens and businesses do not put great pressure on the politicians to develop a more citizen-centric mode of governance. One explanation could be that this group is unaware of the potential of information technology to reform government by designing new and innovative services that can give added value to them as consumers of these services. Another reason can be that they are satisfied with the existing service level and that the funds needed to develop a citizen-centric government are better spent elsewhere. However, we may conclude that this stakeholder group experiences little immediate *urgency* that motivates the group to assemble its forces and apply its power and legitimacy towards the politicians.

This brief analysis shows why the administration is allowed to take the position as a dominant stakeholder and lead the development of e-government according to its own agenda. Administration dominance may not be limited to e-government, but may reflect low citizen involvement in public issues more generally (United Nations 2003).

We propose that the motivation for and drivers of the e-government systems will determine which functions are implemented, and therefore determine the MeGAP-3 score. We suggest that an implementation focusing on efficiency and cost-savings would target functions that would yield these benefits, and would not necessarily target functions that give high citizen satisfaction. We therefore make the following propositions:

- P2.1: A motivation limited to improving efficiency is related to low e-government sophistication as measured by MeGAP-3.
- P2.2: Motivation that includes expanding service is related to high e-government sophistication as measured by MeGAP-3.

Propositions 2.1 and 2.2 can help explain why the MeGAP-3 assessment of Norwegian municipal web sites in southern Norway yielded relatively low *e-scores*—indicating a lag in online service provision—in spite of Norway’s very high e-readiness rating (United Nations 2003).

Effects of Resources and Municipal Cooperation: Large municipalities will typically have more resources to allocate to the implementation of e-government. Large municipalities will also typically have more complex and hierarchical bureaucratic structures, and a higher power distance between the administration and the citizens. Thus, we argue that the potential benefits, efficiency gains and citizen empowerment would be higher in large municipalities. Therefore the cost/benefit ratio would be lower in large municipalities than in small municipalities. Some studies of municipal e-government have found a relationship, between size and sophistication, while others have not. Criado and Ramilo found that in Spanish municipalities the largest cities had

more developed web sites than small municipalities (Criado and Ramilo 2003). Leenes and Svenson found that large national organizations were better than municipalities at providing e-government services (Leenes and Svensson 2002). Moon (2002) found that adoption of municipal web sites was related to size and type of government. On the other hand, Kaylor et al. (2001) found no correlation between size and the *e-score* measure of municipal web sites.

There is evidence of the importance of cooperation. We found that the majority of cooperating, small, rural municipalities had achieved fairly high *e-scores*, at level with much larger municipalities. We argue that cooperation will be a crucial element in the further development of e-government solutions in small municipalities. E-Commerce functions require the integration of many sector applications with the front-end systems, and only municipalities that have access to substantial resources can be expected to achieve advanced e-commerce functionality. For small municipalities the only route would be to pool resources with others. There are substantial economies of scale in developing, implementing and operating common systems. Only the front-end interfaces would be different. E-Democracy functionality will not require the same level of systems integration, and would be easier to implement on an individual basis.

To probe the matter of limited resources and cooperation further, we make the following propositions:

- P3: The e-government sophistication is related to the municipalities' access to resources. Such resources can be related to the size of population, resource pooling or extraordinary revenues.
- P4: Cooperation can alleviate the effect of limited resources on e-government sophistication.

5 Future Research

One of the advantages of the MeGAP-3 assessment tool is the detail it can provide on the status of e-government implementation among municipalities that are comparable in the set of services they can be expected to provide to their citizens. This advantage may be a shortcoming when attempting international comparisons. Because the tool was applied unaltered in the Norwegian context, we now have the data to determine whether direct comparisons with American municipalities are meaningful, based either on the full assessment or on a subset of services relevant in both countries. The development of a Norwegian MeGAP-3 or a truly international version will require additional work. Additional work is also required in order to investigate the need for rel-

ative scores to facilitate cross country comparisons between entities that provide slightly different services.

Currently, few of the instruments for assessing government web site quality have drawn extensively on prior research (including MeGAP-3). Moreover, assessment instruments emphasize different aspects of government web sites. Thus, there is a need for additional work that integrates research on web site assessment and investigates the possibility of integrating both quality indicators and indicators that measure the level and sophistication of on-line service provision.

Investigating effects of different drivers of e-government development:

Our investigation indicates that two distinct approaches to developing e-government can be found among Norwegian municipalities. One approach is characterized by primarily focusing on cost efficiency whereas the other is driven by a desire to offer added value to citizens. This raises a number of questions. Will one approach prove superior over time? Will the different approaches give benefits to different groups of stakeholders (i.e. administration and citizens)? Longitudinal and comparative case studies may provide insights to answer some of these questions.

Investigating seemingly dominant administration in the development of e-government: Our findings suggest that the municipal administration is the dominant stakeholder in the development of local e-government. Municipal administration possesses all three attributes that make a stakeholder dominant, whereas citizens and politicians only possess two out of three. Further research is needed to validate this conclusion. However, if true, it raises a number of issues. Why are politicians and citizens not exercising their legitimate power to influence the development of e-government? What can be done to engage these groups in the development? Will the administrations resent public involvement in this process? How will this affect democracy? Can increased influence from politicians and citizens alter the power relations within local government?

Investigating effects of municipal cooperation for leveraging e-government: In spite of the multitude of cooperative efforts, little is known about potentially different outcomes resulting from different forms of cooperation. Also, little is known about how to make these efforts succeed. At present, the municipalities use different technologies and software to provide their services. Cooperation will inevitably force some municipalities to move to new software platforms. This can be a painful process and is likely to be met with resistance. There are also political aspects in municipal cooperation. Municipalities must answer questions like: What form of cooperation do we choose? Do we run applications for our neighbours or do we let them run ours? Do we

need to implement any organizational change or new incentive systems to make the cooperation run smoothly? Do we need new business models for issuing payment between cooperating partners? The nature of inter-municipal cooperation and its impact on the development of e-government solutions should be examined more closely.

6 Conclusions

In this study the MeGAP-3 municipal government assessment tool was applied to the 30 municipalities of Aust- and Vest-Agder in southern Norway. The results show that although a very high percentage of the municipalities are employing some form of web-based interface to the populace, these sites vary greatly in their sophistication and scope. Although Norway is consistently rated among the top ICT- and Internet-intensive countries in the world, municipalities in Agder showed only modest degrees of implementation of the more sophisticated e-commerce and e-democracy functions. Overwhelmingly, municipal web sites emphasize information dissemination and relatively simple forms of interactivity.

One of the purposes of the study was to test the utility of the MeGAP-3 assessment tool in a non-American context. In this study of Norwegian municipalities, the tool proved useful and gave meaningful results. It provided a ranking of municipalities consistent with informal evaluations of those knowledgeable in the area. It was also useful as a means of identifying specific areas of strength and weakness in the provision of e-government solutions. Nevertheless, it cannot be used unaltered to compare e-government status in different countries. For example, the tool contains numerous services that are specific to the American context and not within the responsibility of the Norwegian municipalities. At the same time, it lacks services that are not relevant in the American context but which may be critical in a foreign context. Adapting MeGAP-3 to accommodate international comparisons seems feasible, but is outside of the scope of this study.

A third purpose of the study was to explore the factors shaping development of municipal e-government solutions. We found that the majority of IT-managers interviewed were driven by a need to increase efficiency and decrease costs. However, one IT-manager advocated a more citizen centric focus, placing service quality and value towards citizens at the centre of attention. The MeGAP-3 assessment did not provide evidence for discriminating between the two approaches. Both scored among the highest in the assessment.

The study suggests numerous avenues of inquiry and presents propositions that may be explored in future research. Numerous efforts have been made to benchmark countries' e-government solutions. Additional work is needed to extend those oriented towards a single country to an international context. In most cases, municipal administration is the dominant stakeholder with an over-riding emphasis on cost-effective delivery of services. The development of services designed to engage the citizenry in the democratic process are lagging. Many questions arise regarding the role of politicians and citizens in the further development of e-government. Finally, little is known about the impact of inter-municipal cooperative IT efforts on the development of e-government.

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Appendix – MeGAP-3 Performance Dimensions

<i>MeGAP-3 Code</i>	<i>Category</i>	<i>Performance Dimension</i>
1	Information Dissemination	Schedules (hours)
2		Directions to Offices/Facilities
3		Searchable Directory
4		Emergency Management
5		Real-time Traffic Info
6		Road Closure/Detour
7		City Charter
8		City Code
9		Budget Report
10		Demographic Info
11		Plat Maps
12		AS-built Images
13		Minutes of Meetings
14		Virtual City Tour
15		Live Traffic/Web Cams
16		Info for Employees
17		Strategic Plan
18		Education
19		Transportation
20		Solid Waste
21		Recycling

22	Interactive Functions	Search Engine
23		Action Requests (CRM)
24		Document Management System
25		Downloadable Forms
26		Building Permit Process
27		Bidder Applications
28		Bids On-line
29		Economic Development
30		Info for Businesses
31		Job Applications
32		On-line GIS
33		Zoning Lookup
34		Comprehensive Planning Process
35		Vital Records
36		Housing
37		Recreation/Class Registration
38		Facility Reservation
39		Public Health
40		Community Services
41		Food Inspection & Safety
42		Voter Registration
43		Parking Permit
44		Temporary Use Permit
45		Bike Permit/Info
46		Pet License

47		Taxi License
48		Street Vendor License
49		Business License
50	E-Commerce Functions	Utilities Payment
51		Utility Start/Stop
52		Property Tax Lookup/Payment
53		Fines
54		Code Enforcement
55		Parking Referee
56		Information Requests (FOIA)
57		Building Permitting Fees
58	E-Democracy	Scheduled E-meetings
59		Conversation Forums
60		On-line Surveys/Polls
61		Streaming Audio of Meetings & Hearings
62		Streaming Video of Meetings/Hearings
63		Participation Opportunities
64		User Customization
65		Volunteer Opportunities
66		Neighborhood Specific Info
67		Listservs
68		Visualization/Consultation Technologies
69	Evaluative Criteria	Consideration of Audience
70		Ownership of Content

71		Consistent Look/Feel
72		Privacy Policy
73		Security Policy
74		Advertisement-free
75		Accessibility
76		User Fees
77		Mulitple Languages/Translator

