Delivering the Digital Goods

Online government information quality from citizens' point of view

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9 mei ‘77 – 27 okt ‘03

Ik had je liever een biertje gegeven “bink”.

Rust zacht,
Richard.

Preface

Well, here I am. Back home after living in Washington, D.C. for half a year to work on this project at George Mason University, Arlington, VA. It sure has been a weird and busy year for me, full of exploration, cool experiences, setbacks and new friends. Living in a different culture for half a year was hard sometimes, far away from the comfort of European "socialism" (according to some of my more conservative American friends). However, it also was one of the most exciting experiences I'll ever have in my life. Washington is a great city; vibrant and quiet, posh and gritty, buildings and nature, mindless television and beautiful culture, local and global, conservative and liberal, cold and hot, expensive beer and happy hour, rallying and lingering… There are plenty of experiences to be had, which I have.

As such I would like to thank my parents for supporting me for half a year and offering me this wonderful opportunity. Thanks for the nice packages from home, even if they did get damaged by either US Postal Service or US customs. I would also like to thank Dr. Van Nispen, Dr. Homburg and Dr. LaPorte. Dr. Van Nispen for helping me find an exchange scholar position at GMU, Dr. Homburg and Dr. Laporte for their guidance and advice during my project. Other people I would like to thank are my American roommates Matt, Jeremy and Deric for giving me insight in US culture and engaging in many interesting discussions. Thanks as well to Eldar, Paul, Nicki and Orien who became good friends, and with whom I have shared many good times. Many thanks as well to all those friendly people that offered cooperation during my project, such as the local government webmasters that have been interviewed, and Allison and Sven who allowed me to stay at their home when I visited Michigan to attend the Cyber-state.org workshop.

Kudos goes out to;

The Smithsonian Institute, for their interesting lecture, film and performance nights;
The National Park Service for Shenandoah National Park, but especially for Rock Creek Park, an oasis in a busy Metropolis;
Capitol Lounge, the coolest bar in the Washington, D.C. area. I WILL go back for 10ct Wing Night once!
DC United, for still playing football (that's the correct word for soccer) with their heart.

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Chapter 1 is an introduction to this project. It starts of with a motivation. This motivation discusses developments in online government information and the quality issues this brings along. The motivation inspired research goals that are stated in paragraph 1.2. Research questions were needed to structure the research and achieve the goals. The questions are introduced and discussed in paragraph 1.3. After this, attention is given to the methodology used to conduct the research. It explains the methods used and how they were put into practice. The chapter ends with a brief oversight of the structure of this report.

1.1 Motivation of study

The digital revolution started less then a decade ago, with the introduction of the World Wide Web and user-friendly, graphics-based Internet browsers. In this short time, information technology has already had some far-reaching consequences in the way organizations process, store and offer information. This can be noticed everywhere in daily life. The way medical files can be accessed by doctors regardless of location is a good example of how this technology has benefited people over the last decade. But also the ease of being able to contact various organizations through e-mail is something which a lot of people have come to appreciate. The relation between government and citizen has changed and is still changing because of information technology (Ministry of the Interior and Kingdom Relations, 2000; Heeks, 1999). The relation between government and citizen is for a very large part based on the exchange of information. This information is exchanged in many ways and in both directions. Different examples of information being exchanged from citizens to government are expressing ones opinion through voting or protest, but also going to the birth-register when a child is born. Examples of information from the government to its citizens are education about policy through leaflets or communicating everyday rules by issuing laws en regulations (Bekkers, 1998). The transfer of information between government and citizens through digital means is called electronic government, or e-government for short. A definition as found on the website of The World Bank Group states: "*E-Government refers to the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government.*" (The World Bank Group, 2003). E-government fits well into the notion of efficient, effective and responsive government. It is oriented on citizen satisfaction and cost reduction. For successful e-government it is important that governments think about what information to offer, its quality and how to manage it all (Thaens et al, 1997).

1.1.1 Scope of this project

This project focuses on the digital interface between citizens and local governments in regard to policy, services and communication. The main focus is the quality of information, services and methods for communication as offered by local governments. Although the digital interface depends heavily on information technology, technology is not what is focused on in this thesis. Like many organizations, the government uses

digital information exchange more and more to communicate with its citizens. As government becomes more aware and technological possibilities grow, more information and more electronic services can be accessed through digital means. Nowadays citizens may find or order public documents online, may voice their opinion through discussion boards, e-mail or chat with government officials and may access electronic civil services online. As such, e-government provides an ideal interface for communication and thus has the potential to bridge the gap between government and citizens. Although extensive digital services are not widespread yet, they are certainly popping up more and more. These services are not just limited to civil services, but can have a far greater impact on the relation between government and citizens. Citizens and government can both fulfill different roles in the context of e-government. Bekkers mentions four different roles for both citizens and government (Bekkers, 1998). While these will not all be discussed in this thesis, it is important to know that e-government is not just confined to the producer/customer relation.

During the 1970's and 1980's there was a shift in focus amongst government towards a more citizen-oriented notion of policy implementation. New Public Management argued that government needed to become more responsive to social developments in order to function better in modern times. Information technology offers an important means to implement these notions from New Public Management. According to Van Duivenboden and Lips customer-oriented e-government initiatives show possibilities for more focus on citizen demands and needs. This in turn is likely to be favorable for government responsiveness and innovation. (Van Duivenboden et al, 2001)

As was said, e-government can facilitate two-way communication between government and citizens. This allows the digital interface to be used in order to improve the legitimacy and responsiveness of government. Digital means of information exchange allows citizens to contact government more easily and thus voice their opinion much easier than before. Through the use of chat meetings, discussion boards or email citizens are able to tell government what they want and whether government is doing a good job or not. At the same time governments can reach citizens much easier if they want to legitimize their policies through online citizen participation. An article by Fountain about e-rulemaking shows that there appears to be unmet demand to participate in the policy-making process (Fountain, 2003). The digital interface can thus be a wonderful tool for both citizens and government. It can offer citizens quick access to information, services and policy making. At the same time it offers government a way to improve their services, become more efficient and have more legitimate policies through citizen participation. Digital information exchange in this regard fits the notions of the school of organizational learning. According to Argyris in the preface of his book "On organizational learning", the reasoning behind organizational learning is that the better organizations are at learning, the better the will be at detecting and correcting errors (Argyris, 1999). At the same time a learning organization will more likely be responsive and innovative. The notions of organizational learning will be discussed more in-depth elsewhere in this thesis. Attention will be given to how these notions may help government organizations improve their communication and at the same time improve themselves.

As e-government is a new phenomenon, lots of interest has gone towards its implementation. Questions focus on the why, the how, its rate of success and its consequences. The quality of the actual interface between government and citizens is discussed less frequently. However, if government wants to use the new media to its fullest, it is probably good practice to make sure it offers good quality. Only then will citizens appreciate this new way of exchanging information with government. Quality is necessary to make people come back another day to make use of e-government or to help them use it effectively. Without quality, online information, services and communication may never catch on. Digital information exchange may waste a lot of its potential and websites may remain a fancy leaflet, while citizens will still have to go to city hall to get their information and make use of civil services "the old way". A lot of potential for a more responsive and legitimate government will go out the window as well if citizens will not use e-government.

Of course, just knowing what quality in this regard is does not automatically create a good and useful interface between government and citizens. The quality of the communication, services and information has to be managed. To start with, quality first has to be implemented. How does one translate the notions of what quality is into effective communication and e-services? This is a big challenge for local government. It does not stop there however. A certain level of quality has to be maintained. Constant attention will have to be given to make sure communication and services still live up to peoples' expectations. The difficulty with this is the fact that peoples' expectations tend to change over time. To make things even more difficult, the technology on which the interface will be based is still heavily in development. Every month, or maybe even every week, something new comes along. This may mean that the whole process of defining quality, implementing and managing it will have to start over. An example of this is the recent interest in Content Management Systems, that allow governments to manage content easier and provides decentralized access. Maintaining the quality of the interface should be an ongoing process. What the real challenge will be is to find out how to improve quality of the (digital) relation between government and citizens. Quality improvement of this interface has the potential to narrow the gap between government and citizens. Formulating recommendations for the improvement of quality management in this regard is an important goal of this project.

As has been mentioned before, notions from organizational learning will help to discuss the difficulty of maintaining a certain level of quality in an environment where the definition of quality is constantly changing. This means that organizations can not keep relying on what may once have been conventional wisdom. Information quality is a very subjective notion. What people regard as high-quality today, may not be so high-quality tomorrow and which aspects of information quality are considered to be most important arguably differs from person to person. Managing quality therefore also means managing the knowledge about quality. Organizational learning fits such a context well. According to Huysman, a learning organization is an organization that provides the right context for employees to learn in and thus create positively valued outcomes (Huysman, 1999). These outcomes may be innovation, efficiency, competitive advantage and better alignment with the environment. According to this definition, organizational learning may provide valuable tools to bridge the gap between government and citizens.

Bureaucracies were always considered to be incapable of learning (Crozier, 1973). However, this was until the advent of information technology. IT enables governments to avoid bureaucratic dysfunctions by using control based on information instead of control solely based on rules (Zuurmond, 1994). IT forces governments to change their organizational structure (Van Duivenbode, 2001) and to focus more on citizen demands and needs instead of rules. This in turn may narrow the gap between government and citizens. Fortunately IT, being a network-based technology, offers the potential for better communication, both internally and externally (Jolly, 2003). This communication, combined with less focus on bureaucratic rules is what allows bureaucratic organizations to learn. This means that information technology stimulates organizations to make necessary changes and at the same time provides the tools that enable them to do so.

1.1.2 Local government

The previous paragraph already mentioned briefly that this thesis focuses on the digital interface between local government and citizens. This does not mean that the discussion and findings are entirely irrelevant for other levels of government. However, for the sake of argument it is better to focus at a particular level of government.

Local government is universal, according to Hague et al (Hague et al, 1998). It is found in every state around the world. As it is often the lowest level of government, it is closer to the citizens than many other government organizations. As such it is not surprising that one of the most important tasks of local government is to deliver (civil) services. Other tasks as mentioned by Hague et al are "*to represent natural communities, remain accessible to their citizens, reinforce local identities, act as a political recruiting ground, serve as a first port of call for citizens with a problem and distribute resources in the light of local knowledge and needs*". The idea behind this is that because it is positioned closer to citizens local government will be better able to meet the demands and needs of the citizens. Local government's tasks are two-fold. As mentioned, one is to deliver (local) civil services. The other tasks revolve around community representation and self-government. This thesis will discuss that e-government has the potential to benefit both service delivery and community representation.
In the United States local government's focal point is service delivery (Hague et al, 1998). However, a couple of local governments are quite large and thus have acquired a broader list of tasks. D.C.'s relatively powerful local government with its powerful mayor is a prime example of this.

In order to gather information about the use of e-government by local governments, several interviews were conducted with webmasters and other people involved with maintenance of online information in counties, cities and townships. Counties are political and geographical subdivisions of states, according to Encyclopedia Brittanica (Encyclopedia Brittanica Online, 2003). There is no nationwide, predefined set of functions of counties in the United States. States individually decide what functions are attributed to County Government. However, some functions are common. Law enforcement, judicial administration, road construction and maintenance and social welfare are functions of Counties in most States. Some counties have a broader range of functions that include healthcare, libraries, parks and agriculture. Of the several levels of

local government in the United States, counties are usually the largest organizations. Although the scale of counties also differs from case to case, they are larger than towns and most cities. Counties often provide a lot of services for small towns and rural areas. An example of this is public transportation. A lot of small towns are not capable of sustaining a public transportation system of their own. In those cases residents use the county's public transportation system.

There is much overlap between the functions of counties and those of the larger cities. As such counties have retained more of their authority in rural areas than in urban areas (Infoplease.com, 2003). Although counties are strictly speaking still the political subdivision between States and municipalities, incorporated municipalities like the Washington Metropolitan Area have most of the local power. Some counties, such as Arlington and Fairfax County have become part of an urban sprawl and have become so-called urban counties. This gives them a status that positions them somewhere between large cities and traditional counties.

Washington D.C. is an exception in that it has State, county and municipal functions. This is due to the exceptional position that the District of Columbia has. It is not part of any state or County. All this resulted in the fact that D.C.'s government is as large as or maybe even larger than that of a lot of Counties.

Most of the visited suburban cities and towns were perfectly "normal" however. These municipalities were al small to mid-sized and depend on the County for a lot of services. The government of these towns and cities are usually quite small, especially compared to the County governments or the government of Washington, D.C.

1.2 Goal of project

Defining quality is an important step towards successful quality management. Managing quality is not possible without a proper, workable definition of quality. Without a definition one could never assess the current state of information quality. However, this is important if one wants to identify opportunities for improvement.

This thesis focuses on the possibilities for improving the quality of e-government initiatives. Quality improvement in e-government has the potential to enhance opportunities for communication between citizens and government. Citizens will be able to enjoy better services and government will be able to improve their policies thanks to more citizen feedback.

Quality management recommendations were formulated from the discrepancies between the conclusions of what quality is and the state of quality as found on certain local government websites. Management practices as found by local governments that were visited also helped to formulate recommendations. This projects hopes to contribute to the improvement of the digital interface between government and citizens. That way, it may contribute to the development and improvement of government-citizen relations. From a scientific angle, the goal has been to add to the discussion of responsive government.

1.2.1 Exploring the notion of quality

In order to create a starting point, literature describing basic notions of quality was used. Although this literature hardly served a purpose afterwards, with the exception of the notion of objective and subjective quality (Bouckaert et al, 1999, p.21-26), it did help get basic ideas in place. Through this literature some insight was gained about the difficulties of working with an intangible, subjective notion.

The Dutch council for Public Administration published an advice on the problem of defining quality (Heijden, 2000). In the advice they put forward the same questions and difficulties as formulated above. It lobbied for a more citizen oriented concept of quality. The Council for Public Administration sees quality as the amount of compliance between wishes and reality. According to the Council for Public Administration, services only offer high quality when they meet the citizens' true wishes, even though the citizen may not have expected that level of quality at all.

The Council for Public Administration also stated that defining quality has become a lot harder during past decades because defining public interest has become a lot harder as well. Society is more heterogeneous nowadays. It consists of many different groups and the people that are part of those groups have become more individual. At the same time these people have become more anonymous, which makes it harder to find out what their opinions are and what they want from government. People also have become more dissatisfied with government actions. The Council states that lack of transparency is for a large part responsible for this. People simply do not know where to go when they want certain services from the government or where to find a listening ear if they want to voice their opinion. Modern government has become like a maze for a lot of its citizens. People simply do not know which route to travel to get done the things they want. E-government has the potential to offer an easy entry to government services and policies. What the Council for Public Administration shows more than anything is the fact that quality is a difficult subject. Quality depends on personal preferences and taste, which makes it hard to come up with a generic definition.

The following article offers an introduction to and an orientation on the difficult concept of information quality. "*Quality in government*" offers three separate dimensions to view quality concepts (Bouckaert et al, 1999, p.21-26). Bouckaert and Vandeweyer formulated the dimensions as follows; the first dimension is goods versus services. They argue that there are differences in characteristics that have a profound impact on quality. Whereas goods are easily definable and measurable, services are intangible, inseparable, heterogeneous and perishable, which makes service quality hard to measure. The second dimension they formulate is consumer oriented versus producer oriented. A producer-oriented notion of quality mainly consists of meeting goals that the management of the organization has set. With the rise of the service economy, a client-oriented notion has become more popular. Tuttle and Romanowski argued in this regard, "*the only way to assess the product's fitness for use is to obtain feedback from users or customers*" (Tuttle et al, 1985, p. 211-224). A client-oriented notion means that meeting single-sided management goals is no longer enough. Instead one should strive to meet citizens' needs and expectations. Of course, the interface for communication, services and information provided by e-government presents a wonderful way to meet

that requirement. The third dimension that is mentioned is that of public versus private sector. Things work slightly different in the public sector. For example, unlike in the private sector "*sovereignty of the customer*" does not apply here. Citizens are sometimes involuntary customers of government services, for example when paying taxes or fines. This makes that the debate about quality is not just a technical debate about standards and methods, but also a debate about values.

Bouckaert and Vanderweyer continue by introducing three parameters of quality. These are objective quality, expectations and satisfaction. They show how relations between objective quality and expectations (subjective quality) are important for the satisfaction of a citizen. Objective quality at least will have to meet expectations in order to keep citizens satisfied. They argue that managing the outcome of these parameters at micro and macro level is vital for maintaining and improving the quality of services. This means that local governments will have to have a way of measuring both objective and subjective quality. Subjective quality can be measured relatively easily by actively seeking citizen feedback using the possibilities offered by information technology. Objective quality however is not easily measured because of the subjective characteristics of the notion of quality. This thesis will introduce a way to scan the level of information quality according to criteria found in literature. These criteria will be discussed in chapter 3.

By looking at the dimensions as mentioned by Bouckaert and Vanderweyer it becomes again clear that the context of a public interface for communication, services and information between government and citizens is very complex. First of all, services are simply hard to measure because of their intangible characteristics. Second, the public sector is characterized by the complex relation between government and citizen. And to conclude, inclusion of subjective citizens' notions eliminates the possibility of looking objectively at the subject.

These problems also have repercussions on the management of quality. According to Zuurmond improving an organization means improving the quality of services, effectiveness and efficiency through a cycle of renewal and development (Zuurmond, 2001). Important to note in regard to the public sector is that quality management also offers government the possibility to improve democratic legitimacy. Quality management demands an organization that is open to innovations and continuous quality improvement. Such an organization is able to convert citizen wishes into policies and services. The organizational culture is focused on learning and its management actively seeks to create possibilities and opportunities to do so.

These three articles obviously all point to the intangibility of quality and the special needs necessary in order to manage it. This presents various challenges in regard to this thesis, which will have to be overcome.

1.3 Research questions

One of the goals of this research was to define quality in regard to communication, information and services offered through local websites. This definition could then be used to find out how the quality of this interface may be improved. In order to be able to reach these goals the following main and sub-questions were formulated. These have been important guidelines along which to structure the research. The main question was formulated in such a way, that the goals of this research would be reached if an answer could be provided. The main question is:

How can quality in regard to communication, information and services through local government websites be improved?

This is quite a mouthful, so let's look closer at what it means. Quality is one of those magical concepts that nobody opposes. Everybody is in favor of maintaining and especially improving quality. The problem with quality is that it depends heavily on personal preferences and definitions. It also depends on situation and context. In a hospital, quality is different from quality in a car repair shop. For example, in a hospital hygiene is of outmost importance. In a car repair shop, this is not really the case. This means that we have to narrow down what we will be looking at. As a student of Public Administration, the first step obviously was to focus on the public sector. However, this still is far too broad to be able to do some decent research. Therefore, the focus was narrowed down further to the context of government websites. This process of refining eventually led to focus on the quality of communication, information and services through local government websites.

This focus on local government websites in turn can be used to present arguments about quality improvement of government-citizens relations. This is done using an inside-out approach. To start off the research is focused on communication, information and services through local government websites, which allows the gathering of empirical data. This data may then be used to discuss the organization of websites. The conclusions that follow from that analysis, coupled with theoretical notions, finally allow formulating conclusions and recommendations concerning government-citizens relations.

1.3.1 Further narrowing the focus…

E-government is more than technology connecting some computer with other computers. As with many things there are more aspects to it than seems at first. The difference between technology and social aspects is a good example of this. Because Public Administration is a social science, this project focuses more on the social aspects. Information technology is merely a means to an end. The digital interface that can be used to close the gap between government and citizens has been the focal point. This includes, but is not limited to local government websites. Quality as perceived by local governments themselves was not the main concern. It is more important that local governments are able to respond to citizens' wishes. Government responsiveness and government-citizens relations are a major issue. This does not mean that there has not been attention for what local governments think citizens regard as quality information.

Discrepancies between citizens' thoughts and notions about quality in local government have provided ideas on how to improve quality in this regard.

In order to narrow down the focus, a categorization of government-citizen relationships was used. As mentioned briefly earlier on, both government and citizens have different roles when it comes to the relation between them. has a profound impact on those roles (Bekkers, 1998). For example, information technology has the potential to make it much easier to share knowledge. At the same time information technology also makes it possible to stretch the boundaries of organizations. These boundaries have an important task in defining the responsibilities and authorizations of government organizations. This way concentration and misuse of power can be avoided. Because boundaries are clear, it is possible to have officials explain their actions. Access to information where others haven't is a way of getting more power. This could disrupt the balance of power between government organizations and its citizens. For example, it is increasingly easy for government organizations to link their files. This way, the linked organizations are able to increase their access to information. If citizens' access to information does not increase as much, government organizations will gain a more powerful position towards citizens. Citizens will not have the same amount of information as the organizations and as such their ability to control the government organizations will decrease.

The value of Bekker's categorization for this research is the fact that it allowed focus on a certain aspects of the relation between government and citizens. The first aspect that will be focused on is the relationship between the government as producer and the citizen as customer. Most contact citizens have with government is through the use of civil services. In that context government is a producer of services and citizens are customers. Using ICT, citizens are able to access more information quicker. Government becomes more transparent to them, which allows them to use services they would not have known of without information technology. Information technology also means that citizens and other groups become more transparent to government. By combining data, or improving citizen-government communication, organizations are able to get a better image of their customers. This helps government to improve the quality of its services. Local governments use their sites to present information and offer e-services. Citizens in their role as customer will be able to make use of these services using the web. The customer-producer relation is one aspect that will be focused on.

Another aspect of the relation between citizens and government that will be focused on is government as stimulator and citizens as participators in the democratic process. Here the government tries to stimulate its citizens to participate in the democratic system by stimulating education, participation in policy processes, voting etcetera. Information technology is able to enhance this process by providing online discussion platforms, chat sessions etceteras. Information can be transferred much easier, which allows citizens to form a well thought opinion and allows governments to actively seek citizen participation. At the other end of the bargain, government receives valuable input from citizens in order to increase the legitimacy of their policies (Bekkers, 1998).

1.3.2 Not just theory

The main research question focuses on quality improvement, the notions from the school of organizational learning in particular. Finding out how local governments manage the quality of their e-government operations is a very interesting aspect of this research as it adds applicability to the research. This is exactly what Public Administration is. Not just fundamental research, but applying the results of this research is what makes it all so interesting. Again, there was no real focus on the technical side of things. However, managing information quality of online content, services and communication does to some extend involve technical possibilities and cost of technology. This explains why some technical issues occasionally do come up in this thesis. Knowing what is and what is not possible is an integral part of improving quality of digital content. This thesis will not delve deep into hardware, software or other such very technical issues though.

To be able to answer the main question it has been broken down into five sub questions:

1. ***How can we define quality in regard communication, information and services through local government websites?***

This is an important part of this project. It is what the rest of this project has been based upon. A definition will allow conceptualizing and measuring quality. However, this definition will not result in one single description of what quality is. As was said before, due to the subjective nature of quality this is simply not possible. What this definition will provide however is a description of which criteria are important in regard to exchange of information through a digital interface. This definition will then be linked to notions of organizational learning, which gives government a useful tool to define objective quality themselves, according to citizens' needs and expectations at that moment. It will also help local governments keep their definition of objective quality up to date.

2. ***How can we conceptualize and measure quality in this context?***

Quality is an abstract term. Everybody has some vague general idea about its meaning. Babbie calls this a mental image which is, as he later explains, called a conception (Babbie, 1998, p.118). This means that the exact meaning is not very clear and therefore there may be different from person to person. In everyday life it is sufficient to know the general idea behind a concept such as quality to have a conversation about it. In science this is not the case. For a research to be valid, it has to be clear from the start what is meant when using a concept. It is important to define criteria of quality, and find out how these criteria may be measured. In his book, Babbie points out that these criteria have to be interchangeable. This means that that the criteria that represent quality will behave in the same way as the concept "quality" would behave if it could be observed. The criteria thus allow measurement of "objective quality" as discussed by Bouckaert and VanderWeyer (Bouckaert et al, 1999). This is not to say that quality is considered to be an objective notion. "Objective quality" is used to be able to gather empirical data that can be used to discuss a notion which is in reality highly

subjective. Objective quality may also be used by government when planning for quality. The conceptualization of quality will be used to answer the next question.

3. ***What is the state of quality in regard to communication, information and services through local government websites in the Washington, D.C. area at the time of this project?***

A point of reference is an important step to improving quality. Without a point of reference it is impossible to identify opportunities for improvement. A scan of the current state of information quality on local government websites could offer that point of reference. In order to answer this question websites have been scanned and some local governments have been visited. An opportunity that is presented by this is the formulation of "best practices". These best practices have been helpful during the formulation of quality improvement recommendations.

4. **What problems with quality in regard to communication, information and services through local government websites in the Washington, D.C. area could be identified at the time of the project?**

Both this and the following question are actually aspects of question 4. However, for the sake of clarity they are mentioned separately. In order to be able to provide arguments on how to improve information quality on local government websites it is necessary to know where it falls short. Scanning websites was a simple, yet effective way of doing this.

5. **What are the causes of the problems that have been identified?**

The causes of the problems could be identified by linking the problems to the results of the interviews. Identifying causes was necessary to be able to formulate recommendations for quality improvement.

6. ***How can quality in regard to communication, information and services through local government websites be improved?***

Of course, it would be easy to just mention the results of the website scan here. However, a simple scan cannot be used to make generalizations and even if a more thorough method would be used than a simple scan, this would simply provide a temporary solution as it does not take the dynamic nature of quality notions into account. As was said earlier quality is a highly subjective notion. Arguments formulated on the basis of an objective approach would therefore not suffice. This question aims to link empirical data to the subjective, more realistic notion of quality. Focusing solely on the scan of several websites would also be quite limited as it only focuses on the actual websites instead of the full potential of a digital interface. This thesis therefore focuses more on the management aspect of maintaining a quality interface between government and citizens through e-government. Again, this is assisted by notions from organizational learning. The scan of local government website is thus a tool to say something about the broader issue using an inside-out approach.

7. ***What recommendations can be given to aid the development and use of a digital interface between government and citizens in general?***

Public Administration tries to be applicable and thereby help implement improvements in situations concerning the public sector. This project tries to live up to that expectation. As was said above, information about best practices and notions from organizational learning have been used to show local governments how they may be able to improve the quality of their communication, information and services. This will not be done by presenting a concrete model, but rather by showing how organizations may benefit from creating an organizational structure that facilitates organizational learning. This will help organizations adjust when notions about quality change. This is something that will most likely happen quite often in the dynamic context of e-government.

1.4 Methodology

During this research several methods were used to gather enough data and information. The use of multiple methods means that a well-rounded view of the topic could be formed without having to deal with possible biases that may come with one single method.

1.4.1 Literature study

This research has for a large part been an exploration of the theories that are already out there. Literature study helped formulate a definition of information quality. This definition is based on criteria that are frequently mentioned in the literature. If more than one theory labeled the same information quality criterion important, this added to the validity of the notion that this criterion is indeed important. The criterion was then more likely to be used in the final definition. Also, the weight of the research behind the theory was considered in this regard. Whenever two theories stated the opposite, the theory that was backed up by the most extensive research was regarded as more authoritative. International research was always favored over small exploratory research for example. If a theory contained unique notions that were not backed by other literature, the strength of the arguments were decisive on whether it should be used.

One problem, according to Wester, is that too much literature study at an early stage of research may force the researcher into a particular way of thinking and thus prevents an open mind when looking at the gathered data (Wester, 1987). During this research literature study was used up-front to prepare the website scan and interviews. However, the bulk of theories and scientific notions that are used were found through literature study after data gathering had been finished.

1.4.2 Secondary analyses of surveys

As was said earlier, in e-government it is important to use a citizen-oriented concept of quality. What was also said earlier is that the only way to obtain a product's fitness for

use is to get citizen feedback. When translating these arguments to the goal of my research, "*…information and services offered by local governments to its citizens…*" it shows that feedback, data about citizens' notions of what quality in this context is, was needed. Secondary analysis of citizen feedback received by local governments proved to be valuable. Secondary analysis was specifically used to find out what citizens think is relevant information to put on a local government website. Surveys conducted by Fairfax County in Virginia in particular offered a lot of insights.

Secondary analysis offered the advantage of being able to get data that would have taken too long to get if it had to be collected by setting up an entirely new survey. So, it is fortunate that some local governments had already gathered some data amongst citizens, which they had used for website redesign and improvement. A disadvantage when using secondary analysis is that the original survey's purpose may not be entirely appropriate for this project. The possibility of a slight "misalignment" has been taken into account (Babby, 1998).

1.4.3 Scan of local government websites

Literature study and secondary analysis helped construct a definition of information quality. This definition was then used to construct a structured, qualitative checklist to use as a guideline to scan the quality of local government websites in the Washington, D.C. area. These guidelines can be seen in appendix 1, the local governments in Appendix 2. The goal of this evaluation was not to result in a generalization of the current state of information quality. The size of the sample and the subjectivity of quality did not make that possible. The results were used as a cautious exploration of issues that may affect information quality negatively. This exploration provided directions for the argumentation found in this thesis. The guidelines, its implications and the results of the evaluation are discussed in-depth in chapter 4.

The advantage of a scan was its practicality. Especially the fact that it could be done relatively fast was a major reason for using this method. However, this has some serious consequences though. Since this scan by a single person could never be an objective way of assessing the state of quality, generalizations as such could not be made. While this is unfortunate, the scan did allow identification of some common problems with information quality in regard to local government websites in the Washington, D.C. area. This was sufficient for the goals of this project.

1.4.4 Unstructured interviews

Qualitative, open, in-depth interviews with key figures in local government were used to gather case data. The most interesting people for this research were those that are responsible for maintaining the quality of the digital interface. These could be webmasters or public information managers. The value of in-depth interviews is that they offered nuances. For example, local government may be aware of certain quality problems, but are not yet able to do anything about it because of organizational barriers. This may be due to budgeting, organizational structures or technological issues.

The interviews also offered insight into the local governments' point of view. It explained why local governments offer certain services and provided insight about their notions of quality. It was also a powerful tool to learn about procedures and establish a notion of what is necessary for successful implementation of e-government. Of course, with this being a qualitative instrument, more people within local government offices could be interviewed if it would provide useful information. Based on the results of the evaluation of the current state of quality and the results of the depth-interviews with key figures recommendations to improve the quality of information offered through local government websites have been formulated.

The unstructured approach also allowed delving deeper into certain topic that seemed particularly interesting and useful. However, at the same time this is where danger was lurking. As interviews went by it became clearer what was interesting and what should be focused on. In order to make sure that the last interviews would not be completely different from the first a guideline with basic questions was developed. This way every interview was based around the same questions while still retaining the possibility to pursue interesting remarks etceteras (Wester, 1987).

1.4.5 Workshop

A workshop by Cyber-state.org about connecting citizens to local government through e-government provided a lot of insight into the everyday practice of local government webmasters. By simply attending this workshop a lot of information was gathered through the presentations that were given by people involved with e-government and discussions that were held amongst the attendees. The main advantage of this is that it concerns information that is not based on theory and that comes straight from those that deal with this topic in everyday life. It also offered data on this issue in a lot of different contexts, ranging from small towns to large cities.

1.5 Structure of report

This chapter mainly focused on the goals, questions and methods relevant to this project. This was done to ensure scientific validity and formulate guidelines along which this project has been undertaken.

Chapter two will focus on a conceptualization of information quality management, using notions found in scientific literature. The two major schools of quality management from scientific literature that are discussed in chapter 2 are total quality management and organizational learning. These notions are integrated at the end of chapter 2 to form a conceptualization which has been used in this project as a red line. The conceptualization is used consistently in all chapters when discussing findings.

Through literature study several aspects of information quality have been identified and discussed in-depth in chapter 3. Chapter 3 thus really formed a basis for the rest of the arguments about the management of the quality of information, services and communication. The various identified quality aspects are discussed in this chapter,

leading to a definition of information quality that has been used throughout the rest of this thesis and ultimately the formulation of recommendations. The chapter will be concluded with a discussion about the relations between these criteria.

Chapter 4 will focus on the present day quality of local government websites in the Washington DC area. It will not try to establish a generalized state of quality, but rather present some of the problems webmasters are facing. These problems will be discussed according to the various information quality criteria as discussed in chapter 3. These problems often can be traced back to management problems and organizational culture. This in turn can often be linked to notions from organizational management.

This link between quality problems, organizational management and quality improvement will be discussed in depth in chapter 5. This is done by linking the results of the scan of websites and interviews with webmasters to notions from scientific literature. The conceptualization of quality management as formulated in chapter 2 has been used frequently when discussing these problems.

Chapter 6 will conclude this thesis by presenting conclusions about the findings from this project. It does so by presenting the answers to the research questions one question at a time. After this it presents a reflection on theoretical notions and the consequences that these notions have in regard to the management of the quality of the digital interface. As one of the research question focuses on formulation recommendations, these recommendations can be found in this chapter as well.

2

In this chapter notions from total quality management and organizational learning will be discussed. The chapter starts off with the discussion of various levels of quality management and evaluation in paragraph 2.1. Paragraph 2.2 focuses on notions from total quality management, a popular school in management literature. Paragraph 2.3 will discuss notions from organizational Learning, a somewhat more recent way of thinking about management of quality. Paragraph 2.4 will provide arguments that both schools can be integrated and so provide valuable clues for tackling difficulties in regard to the management of quality in e-government initiatives.

2.1 Conceptualization

According to Babbie, "*A theory is a systematic explanation for the observations that relate to a particular aspect of life…*" (Babbie, 1998, p.52). Because research can be overwhelming due to the amount of interdependencies and variables that exist, theories are used to help "simplify" complex situations by providing a workable model. Theories help point out important aspects of real life situations. These aspects will form the framework for research (School of Public Administration, Erasmus University Rotterdam, 1998, p.7).

2.1.1 Various levels of quality management and evaluation

The first model to be discussed is presented by Zuurmond. This author discusses how quality may be improved, using the INK-model. The INK model is a tool used to select candidates for the Dutch quality award. The tool shows the three stages of a quality management loop.

- The first stage revolves around quality management in the organization itself.
- The second stage focuses on the evaluation and perception of quality by citizens.
- The third stage is characterized by learning and innovation based on that evaluation.

Although this type of quality management model is not rare, the INK-model differentiates itself by identifying several levels that make up stage one and two. Quality management in the organization can be done through employees, strategy and policies and resources. As will be discussed in the next paragraph, Total Quality Management argues that it is best to use them all to achieve the best possible quality improvement. More interesting is the question which level should be the focus when evaluating quality. Zuurmond recognizes evaluation by employees, individual citizens and society (Zuurmond, 2001). Quality evaluation by employees is something which should continuously take place. This is usually based on objective quality, which constitutes of objective goals and views on what is considered to be quality e-government. However, subjective quality as provided by citizen is more important for quality improvement, as it is based on citizens' needs and expectations. Especially in regard to democratic legitimacy it is important for government to try and measure results through evaluation by society. This is often impossible to achieve because of the enormous effort it would

take. The next best thing therefore is evaluation through individual citizens. The users of e-government can be a valuable source of quality evaluation. In fact, as will be discussed later on, it is necessary for government to measure quality evaluation by users. Without it there will be no basis for quality improvement. Evaluation by employees may be useful during development and testing, but because objective quality may be quite different than subjective quality this is not really an option for measuring results.

The INK-model inexplicitly shows how both objective quality and subjective quality fit in a quality management loop. In the first stage of the loop objective quality is needed in order for organizations to set internal quality goals and be able to determine whether those goals have been met and information or services are fit to be offered to citizens. Here objective quality offers guidelines to help organizations to offer the best possible level of quality from the start. In the second stage this objective quality is compared to subjective quality. This is done by measuring evaluation by citizens, for example through surveys or other types of feedback. The notions of objective quality as used by the organization are then adjusted to incorporate what was learned from citizen feedback in stage three. Again this shows that subjective quality is what really counts and objective quality should be seen more as a way to try and approach subjective quality as closely as possible.

The INK-model, coupled with the notion of objective and subjective quality, shows why it is important for government to seek citizen feedback. It is an integral part of successful quality management and should not be overlooked. It also shows that government should try to measure citizen feedback as closely to society-level as possible. This means that if this is not possible government should opt to measure evaluation by individual users. Evaluation by employees should never be considered a true alternative for this. Again, this has everything to do with the true nature of quality, its subjectivity.

2.2 Total Quality Management

A lot of scientific literature about managing quality originates from or is influenced by total quality management. This school of thought is very broad. Williams states that TQM is a process, a technique, a management style, a goal and a tool. But most of all it is a style of leadership, which creates a quality oriented culture in an organization (Williams, 1994, p.2). Although it is difficult to classify TQM, it has some basic principles that could offer valuable insight in regard to this research.

Organizations constantly have to evaluate whether the quality of the product they offer is still meeting the levels of demand. This is also true for civil services and even more so for services offered through websites. The Internet and ICT in general are constantly changing. Technology gets more sophisticated by the month, new software is being developed all the time and with this, peoples' expectations continue to grow. This means that offering quality services is not a matter of assessing what people want and then implementing this. Offering quality services through websites will be an ongoing process

in which three stages can be identified. These stages run parallel with those presented in the INK-model in the previous paragraph.
The first stage sees quality as provided by the supplier. As discussed in previous paragraph the notion of objective quality is used in this stage.
When using e-government citizens evaluate its quality, comparing it to their needs and expectations. This in turn triggers some kind of response, which may include complaints, comments or praise. This feedback can be used to assess subjective quality.
If this has been measured, organizations will review the objective quality of the services as they offer it. The objective quality of the service may then be enhanced using what was learned through quality evaluation by citizens, which completes the circle.

Williams states that there are two ways of conduct from a producer point of view. The first is when citizens have the possibility to offer input. The organization will focus on quality of products and service, the ease of doing business with the organization, prizes and warranties. This conduct demonstrates the three stages as discussed earlier. If the organization is not open to citizen input it tends to focus more on profit margins, expenses and to protect the organization from its citizens. Here the organization is not receptive to citizens' feedback. The second and third stages of the quality improvement loop are thus completely missing. This may eventually have big consequences for the overall performance. The first way of conduct as mentioned by Williams concerns an organization that is responsive and innovative. Responsiveness is not a characteristic that is usually attributed to bureaucracies. However, as discussed earlier, Van Duivenboden and Lips argued that information technology may change this. Because ICT requires a new approach to service provision it forces organizations to be more oriented on citizens needs (Van Duivenboden et al, 2001). Responsiveness in any case is a requirement for successful quality control according to both TQM and the INK-model. Only responsive organizations will be able to link what was learned from subjective quality to objective quality. Unresponsive organizations may even have a hard time opening up to citizen feedback.

One of the founders of Total Quality Management said, "quality is fitness for use". Quality is not an abstract ideal, but depends on the needs and expectations of citizens (Juran, 1974, p.2). One may even say that the citizen is an integral part of the production process in services, which is demonstrated very well in the three-stage model discussed in this paragraph. In manufacturing the consumer does not play as big of a role. The production process takes place at one time in one place and the citizen is on the receiving end of this process. In e-government however, citizens should be able to become co-producers of services and participators in the policy-process. The citizen has influence in terms of added value, quality and legitimacy. This role of citizens should not be ignored. The quality evaluation of citizens, their ideas and perceptions, must be taken into account during the process.

The focus on citizen needs and expectations is one of the basic principles of TQM. Improving quality is all about meeting citizen demands. Marshall put it as follows; "*The reason to be concerned with quality is that quality is the customers' concern*". Marshall continues by stating that management must actively try to identify and understand citizens' needs and desires. This must be an ongoing process as these needs and demands continually change (Marshall, 1993). This ties in with what is important in

maintaining information quality. Government constantly has to be open and listen to citizen feedback.

Juran and Blackiston make a statement for a unified approach to quality, which fits all levels, functions and services within an organization (Juran et al, 1995). In their view, managing for quality consists of three basic quality processes, which they call the "quality trilogy". This quality trilogy consists of quality planning, quality control and quality improvement. Quality planning sets out basic quality goals to be met using objective quality. Usually, the ideal level of quality can not be met as this should be based on subjective quality instead of objective quality. Quality control is meant to make sure that quality levels stay within certain limits. Because there will always be a discrepancy between the ideal (subjective quality) and real (objective quality) situation, there will always be room for improvement. This is where the third stage, quality improvement, comes in. Quality improvement based on measuring subjective quality is able to propel levels of quality to levels, which can not be reached by quality planning alone. Of course, these three stages are not as separated as it might seem. It is an ongoing, incremental process. This thesis supports the notion of a three-stage model of quality management.

TQM demands long-range thinking and long-term planning. Quality improvement is a time consuming endeavor. It takes a lot of resources and time and the results can only be noticed after a while. In order for TQM to be successful commitment is needed from both management and employees. Apart from commitment there are a couple of other aspects that are necessary for the implementation of TQM. Williams states four. First of all organizational culture has to be suited for TQM. If employees will resist change on a large scale any attempt to implement TQM will fail. In TQM it is important that every member of an organization supports the effort. Other aspects are that quality management is calculated, coordinated and comprehensive. Calculated in that it is intentional and not a spin-off of another management program. Calculated quality management also means that the effort is obvious to and shared with everybody in the organization and to those involved outside of the organization. Quality management also has to be coordinated well amongst everybody involved so that everybody knows what is expected of him or her. The final aspect mentioned by Williams is that it should be comprehensive in its implementation. As many tools and areas of the organization should be included to maximize the probability of success (Williams, 1994). For example by utilizing every level of quality management as mentioned by Zuurmond (Zuurmond, 2001) Above all, and something that is inherent to TQM, is that quality should be constantly monitored. By setting clearly defined goals based on objective quality and measuring subjective quality, conclusions can be formulated that tell organizations where quality has to be improved. Measuring subjective quality is a basic principle that is needed for all other critical success factors.

If we integrate Zuurmond's notions with those of TQM we see that TQM is an important aspect in improving not just a service or a product, but the entire organization as well. An improved organization in turn improves the quality of its services and products. The aspect of improving not only services and products, but the entire organization is the focus of organizational learning literature.

2.3 Organizational learning

Organizational learning is being discussed in a range of disciplines. These range from psychology, management science and sociology to anthropology. Management science looks at organizational learning in a context where organizations are changing from being focused on physical resources to focusing more on intangible assets. Management has plenty of experience with transforming physical resources by using and implementing labor. Organizations' management has yet to learn however how to harness more intangible assets. There is little experience with the transformation of informational and knowledge resources into integrated work systems (Pawlowsky, 2001).

There are various perspectives on organizational learning in management literature. The perspective of organizational decision-making and adaptation was introduced by Cyert and March and revolves around a stimulus-response (Cyert et al, 1963). Here organizational learning is triggered by external shocks, which make adaptation necessary. Standard operating procedures are changed accordingly and with that so is the "memory" of the organization. March and Olson presented a less mechanic notion of organizational learning by focusing primarily on organizational intelligence (March et al, 1976). To these authors, organizational learning is based on experimental learning based on cognitions and preferences. In other words, the views, opinions and personalities of individuals are of central importance in this model. With that, psychological factors were introduced to the idea of organizational learning. Levitt and March went even further by stating that organizations learn by encoding history, beliefs, paradigms, cultures etceteras into routines (Levitt et al, 1988). These routines survive longer than most employees and are thus a good way to store what is learned from direct experiences (Pettinger, 2002).

The systems-theory perspective focuses on the relation between system and environment. The environment exerts pressure on organizations that management has to deal with. These pressures have influence on the structure of the system. Feedback takes an important place in the systems-theory approach. By measuring feedback and linking these to structure and processes organizations will be able to approach their goals more and more closely. (Jolly, 2003) The relation between environment and organization is a key factor. Again we see the importance of responsiveness. The systems-theory perspective also focuses on self-referentiality. Organizational learning is seen as problem-solving potential of social systems. Here management is advised to allow "autonomous developments" and create conditions that promote self-referential processes. The systems-theory perspective also points to the necessity of understanding the complex relations of social systems and their dynamics. Once this knowledge is available it can be used to understand and manage complex systems (Pawlowsky, 2001).

The cognitive perspective is based on the classic works from the decision-choice perspective. The main difference is that the cognitive perspective focuses more on the influence of values and beliefs. It revolves around the assumption that all actions are rooted in a cognitive basis such as norms, strategies and assumptions. This means that people do not learn by simply remembering situations and experiences but learn by

interpreting those situations and experiences according to their own cognitive value, belief and knowledge system. Although originally the cognitive perspective focuses on individuals, but there is a tendency to apply it to organizational and group levels as well. At that level organizational learning can be seen as changes to the organizational knowledge system. These changes are what enable organizations to learn, improve the understanding of their environment and improve their services. The knowledge system consists of the collective associations, cognitive systems and memories of members of an organization. An interesting question here is how organizations develop knowledge (Van der Meer & Ringeling, 1998).

According to the knowledge perspective, organizational reality (knowledge) is produced through interaction between members of the organization who are developing a joint interpretation. Organizational knowledge can be either explicit or implicit. Explicit knowledge can be transferred through language. Examples of this are rules, guidelines and standards which can be published. Implicit knowledge can not be transferred by language so easily. Implicit knowledge is based on individual experiences, and cognitive systems. The real challenge therefore is to somehow extract and store implicit knowledge in the organization. This can be done by letting other members of the organization experience individual knowledge (Steijn, 2001). The classic mentor system is a good example of this.

The cultural perspective has its roots in the interpretative approach to human behavior. Inherent to the cultural perspective is that it focuses on the organization as a whole instead of just individuals and thus compliments the cognitive perspective nicely. It is built on the notion that members of an organization develop a set of subjective interpretations of everyday reality (Wildavsky, 1983). Organizational culture consists of values and beliefs that can be observed through symbols, stories and ceremonies. Examples of this are the initiation rites of fraternities or the way people address a superior. Because culture takes long to develop, it is often deep routed in an organization. This makes it a source of defensive routines within organizations that are often used to resist change. These defensive routines come into play when people are faced with threat or possible embarrassment. In those situations people are likely to do as much as possible to prevent the embarrassment and bypass the threat. Organizational knowledge systems should therefore not be seen as just constructions of reality, but also include constructions of meaning (Addleson, 1996). Organizational learning in this perspective is a way to neutralize or deal with those defensive routines and bring about change in procedures, organizational knowledge, people's minds and even culture itself.

The final perspective is that of action-learning. The main assumption here is that learning takes place through actions. This is based on the idea that real learning comes from reflection after action. This reflection provides understanding, something which cognitive learning, based on memorizing, does not. One of the tools action learning offers is the learning set. The learning set is a group of participants where experiences are shared and understanding is developed. External knowledge can be added to this process. The group is almost always managed by a facilitator (Mumford, 1997).

Over the decades there has been a general trend in organization from mechanic notions to a more organic notion of organizational learning. Even March, who started out with very mechanic notions changed his ideas to incorporate these notions. In his latest works he describes a more organic view of organizational learning. (March, 1999)

The most significant distinction in organizational learning is the emphasis on technical or social process. Important in the technical view is effective processing, interpretation and/or response to information from both inside and outside the organization. Rationality is a large component of this view. The social perspective on organizational learning focuses more on how people make sense of their experiences at work. These experiences may be from both well defined and tacit sources. In this view therefore, learning is mostly based on social interactions. There are three major components. The first is that learning is socially constructed. The second sees learning as a political process and the third sees it as a result of the culture of an organization (Easterby-Smith et al, 1999).

This thesis focuses on the systems-theory perspective. Especially the interaction between organization and environment is of major concern. Through interaction between citizens and government will the latter be able to learn and improve its services, communication and policies. The digital interface between citizens and government therefore fits this perspective perfectly. This perspective has been approached from a technical view as discussed above.

Change in behavior is a primary criterion for effectiveness, according to organizational development researchers and practitioners. One can do this through direct behavior modification, such as training. Another way is to try and make sense of and understand meanings people create when they deal with each other. It is especially important to be aware that there might be a difference between what people say and what people do (Argyris, 1999).

People learn through the outcomes of their actions. They learn when they achieve what is intended and they learn when there is a mismatch between intentions and outcomes. Learning may not occur until a problem is discovered or someone invents a solution to a problem. However, learning does not actually occur until such a solution is produced. Discovering problems and inventing solutions are therefore necessary, but not sufficient conditions. It is up to the organizations to create an environment where people are able and challenged to learn. However, the difficulty with this is that people may also introduce biases and restraints. Afraid for what is to come they may become defensive and resist change in order to protect their position. This way they obstruct learning, which is one of the bigger problems in organizational learning (Argyris, 1999).

2.3.1 Technology as trigger for organizational learning

Organizational learning is often triggered by changes in the environment. One of the major changes in the environment of local governments in the past decade has been the introduction and expansion of information technology. As discussed earlier in chapter 1, information technology is more than just a tool. It opens up possibilities for a network-

based approach, which allows better communication between government and citizens. However, if the full potential of this technology is to be used, organizations will have to adapt beyond present institutions and structure. This is because the use of technology has always been artifact based and not system-centered. Information technology may be used in an artifact based manner, but its real strength lies in system-centered applications. E-government is such a system-centered application. It allows people to use one medium, the Internet, to directly tap into or influence other applications. This situation will only grow more profound in the coming decades as technology becomes more and more important. People will use it more often and there will be more variety and applications. The speed and complexity of this change have profound impact on the way organizations have to deal with this new technology and on organizational structure.

First of all organizations will have to recognize and understand the potential of new technology. Without this awareness organizations will not be able to continue the learning process by holding the new situation against existing procedures and structure. This is necessary in order to decide whether the new technology can be integrated in existing conditions through single-loop learning or whether the new technology should trigger double-loop learning. This then leads to a second step where the organization needs to adapt and develop new or modified organizational procedures or structure. Often this entails developing new skills, either from outside or through training. Obviously, more complex technology increases the need for new skills. With information technology the change is very profound, especially due to the shift from artifact-based to system-based. Recent changes are therefore likely to not to fit existing procedures and structure and will trigger double-loop learning (Dierkes et al, 2001).

2.3.2 Single- and double-loop learning

One of the important concepts in organizational learning is the distinction between single-loop learning and double-loop learning. This concept was first introduced by Argyris and Schön in their publication "*Organizational learning*" (Argyris et al, 1978). Single loop learning occurs when people and organizations learn from their successes or failures and match their actions and procedures accordingly. For example, webmasters may find out that parts of government websites are not as popular as they would like it to be. It is called single-loop learning if they then improve the quality of the site by removing or improving less popular pages and enhancing the popular ones. Double-loop learning occurs when people learn by questioning the governing variables. These are the underlying believes and values of individuals. In the previous example double-loop learning would have occurred if the webmaster would have stopped to wonder why people did not visit those pages and if there was something wrong with the used approach to government websites (Argyris, 1999).

Jolly also discusses governing variables. According to Jolly every individual interprets situations according to governing variables. These governing variables consist of unconscious anticipations, biases and methods used to determine whether observations and experiences are relevant. The governing variables are partly determined by context. Individuals from the financial sector for example tend to focus more on efficiency and

effectiveness. Governing variables are not necessary correct or wrong. Individuals just place different emphasis on certain observations and experiences (Jolly, 2003). As mentioned before, governing variables may be changed or adjusted through double-loop learning.

Single-loop learning takes place in the existing structure of an organization. This kind of learning facilitates improvement without changing underlying norms and structure. The changes that result from learning still fit everyday notions and ideas that have been in use for some time. With double-loop learning, the existing structure of an organization also undergoes changes. Usually this happens when environmental changes cannot be dealt with within the existing context of the organization. Of course, more drastic changes in the environment mean more drastic changes in the organization. Because double-loop learning challenges existing norms and ideas it often leads to conflicts. Double-loop learning is also more likely to result in political behavior since people may feel threatened because of possible changes in organizational structure. Although this distinction is used frequently in literature, there are some difficulties. The difficulty with any such theoretical distinction is that the distinction is not as easy to make in practice. Learning processes often do not fit these categories easily. There may even be arguments whether some case fits single-loop learning better or double-loop learning (Dierkes et al, 2001). Understandably double-loop learning does not occur regularly, since it deals with more complex issues. Single-loop learning is more appropriate for daily tasks and routines. Argyris argues that organizations can be seen as a social technology that processes double loop learning into single-loop learning (Argyris, 1999).

Of course this distinction between single and double-loop learning is not there for the sake of it. Scholars in the field of organizational learning are convinced double-loop learning is essential for the long-term survival of an organization. Much like the TQM authors that were just discussed, organizational learning scholars point to the importance of continuous improvement of quality. In organizational learning this improvement is produced through learning. A recent example that may support this is the fall of McDonalds. McDonalds was considered the best fast-food restaurant by many. However, lately McDonalds has had more and more difficulties in attracting customers. Somehow McDonalds went from a respected fast-food chain to a place with a reputation for low-quality. McDonalds spent all its organizational life improving existing procedures, but never questioned the underlying principles of its business model. During the last decade peoples' notions about fast-food and quality changed and McDonalds never noticed until their stocks started plummeting.

The most popular approach when explaining the mechanism of how organizations learn is the action-learning perspective. In action learning, learning is seen as something that occurs from experience on an individual level. Individuals learn from certain experiences, for example citizen feedback about e-government. The individual then links this to former experiences, which leads to certain conclusions and thus new knowledge. This knowledge is implemented in a new modified approach. In the process the knowledge is shared with other members of the organization. Here meaning is given to the new knowledge, and frameworks are built around it. The new knowledge finally becomes part of organizational memory when it is used to shape routines, forms etceteras (Jolly, 2003).

Throughout literature scholars agree that in order for organizations to learn some conditions are necessary. Friedman et al. divided these conditions into structural and cultural elements (Friedman et al, 2001). Structural elements are those formal and informal structures that foster learning and the gathering of knowledge. Friedman calls these organizational learning mechanisms. The author makes a distinction between integrated and non-integrated organizational learning mechanisms. When members analyze their own and others' experience in order to improve their own performance it is called an integrated OLM. However, when members do this to store and actively distribute the knowledge amongst others it is called a non-integrated OLM. Examples of OLM's are training and departmental work-evaluation meetings. Organizational learning mechanisms are necessary but not sufficient in order for an organization to be able to learn effectively. For this there also has to be an organizational culture and climate that encourages and empowers its members to learn. This is the so-called cultural element in the necessary conditions. Important behavioral factors in regard to this cultural element are transparency, inquiry, disconfirmation and accountability. An organization is transparent in this regard when members are willing to communicate and share their actions, thoughts and intentions, including the reasoning behind it all. The advantage of this is that more valid information will be available to base future actions on. The counterpart of transparency is inquiry. Just as it is important to actively share information it is also important that members actively seek information by asking questions, collecting data and identifying mismatches. The behavioral factor of disconfirmation refers to whether members are willing and have the opportunity to admit errors or change their minds when that would be the better course of action. In a lot of organizations such a thing might be harmful to ones position, something that thus has to be avoided. Being able to admit errors without consequences helps the detection of mismatches and possibilities for improvement. The final important behavioral factor is accountability. Accountability means that members are willing to hold themselves and others responsible for actions, but also that corrective measures are taken.

These last two behavioral factors seem to conflict at first. Accountability and errors without consequences cannot co-exist. The explanation can be found by using the distinction between single and double-loop learning. In single-loop learning the focus will be more on accountability since quality procedures are improved by reducing errors. In double-loop learning the focus shifts to disconfirmation. In double-loop learning there should be room for experimentation, making errors and learning from the unknown. This is an important distinction between single and double-loop learning. Whereas double-loop learning permits a lot of freedom for different ways of learning, single-loop learning is more confined to existing structures. Quality improvement will have to be done while keeping existing quality up to scratch. This means that the more structured quality procedures gets, the less room there is for learning. Although it will happen on a smaller scale, single-loop learning is nonetheless essential in regard to continuous quality improvement. One advantage of single-loop learning over double-loop learning is that single-loop learning is less likely to cause large conflicts. Double-loop learning usually leads to bigger changes, which in turn are more likely to run into (cultural) barriers. However, those barriers will be discussed in greater detail later.

It has to be said that another important factor, especially in regard to psychological and behavioral conditions, is the commitment of an organization. An organization should

actively encourage its members to learn. Without possibilities and opportunities for learning, members will not be able to gather and store new knowledge. In that case an organization will loose a lot of potential for quality improvement.

2.3.3 Resistance to change

Some local governments that were visited during this research were still at the very beginning of their e-government initiative. These organizations often have to deal with internal conflict and turmoil. Change may be resisted because of rational choices. To managers or other members of an organization such resistance may not always seem rational. However, once the true reason becomes know the opposite often turns out to be quite logical. Kegan and Lahey call these reasons for resistance competing commitments (Kegan et al., 2002).

Organizations are social systems made up of people that have emotions, identities, ideologies and different levels of power (Luecke, 2003). Whenever these people are confronted with change all these factors come into play. This adds significantly to the complexity of such situations. Successful management of change therefore requires recognition of people factors and the social systems that exist within an organization. According to Luecke people tend to stick to routines because they are familiar, comfortable, safe and satisfying. For these reasons people do not like to change their routines.

People who think they will lose out on certain advantages they enjoyed in the old system are more likely to resist the initiative. This resistance can be passive by not committing to goals, or active by direct opposition. Luecke presents ways to try and redirect potential resisters. Before implementing change one should anticipate where in the organization resisters are likely to emerge and how they will respond. It should be communicated to these people why there is a need for change and why routines should change accordingly. In order to take away some of the causes for resistance managers can emphasize the benefits of the change so they will focus less on their losses. Luecke mentions that many people resist change processes because it represents a loss of control over their daily lives. This control can be returned by making these people part of the change process.

Not all resistance to change is based on defensive postures of members of an organization. In their article Kegan and Lahey focus on somewhat more personal reasons why people can resist change. According to these a lot of people resist change, even when change is in their best interest, because they are reluctant to place themselves in unfamiliar situations. For example, some people will not do their outmost best, afraid a next assignment will be tougher and they will fail. They make a rational choice in order to avoid any chance of embarrassment.

Obviously the notion of responsiveness comes directly to mind in this regard. An organization that suffers from these kinds of bureaucratic dysfunctions will not be able to successfully implement a quality improvement loop due to the lack of responsiveness. As discussed before lack of responsiveness inhibits organizations to learn from citizen

feedback, an essential stage of the quality improvement loop. As such organizational learning can be considered essential for quality improvement. Organizational learning is a key factor in creating a responsive organization. Information technology has the potential to enable the changes necessary to facilitate learning and thus responsiveness.

2.4 Integration of notions

As may have been noticed, total quality management and organizational learning share many common grounds as far as quality improvement is concerned. Both stress the need to continuously improve quality through some learning process. In total quality the focus lies on learning and improvement through citizen feedback. With organizational learning the focus is obviously also learning, but much more on underlying principle of actually creating a context and structure that facilitates that learning. As such one could say that organizational learning goes one step further beyond the notions of TQM in that regard.

It also goes further than TQM in that organizational learning not only focuses on improving services and products, but also on improving the actual underlying policies and strategies through citizen feedback. TQM focuses on improving the quality of products and services through single-loop learning. Organizational learning offers the notion of double-loop learning, which argues that citizens may have an active role in changing organizational structures and policies. This thesis focuses on the public sector where participation in the policy process is of greater concern than in the private sector. Participation in the policy-process enhances democratic legitimacy and narrows the gap between government and citizens. As such double-loop learning has the potential for a more responsive government.

It is possible to integrate the notions of TQM into those of organizational learning. TQM fits the notion of single-loop learning. It discusses how an organization can improve its services by listening to citizens and implement a continuous loop of quality improvement. The similarities with single-loop learning are obvious. TQM however does not address the need that sometimes arises to question organizational structure, policies or even culture. This is where double-loop learning comes in. Double-loop learning adds an important notion to TQM that is otherwise missing, but which is important to the public sector.

The consequences of this conclusion are important for our understanding of the distinctions between single and double-loop learning and what those mean in regard to quality management. TQM focuses largely on specific processes and services. According to this conclusion this means that the more focus shifts to improving the quality of specific processes and services, the less room there will be for experimentation and large innovations. These are confined to the realm of double-loop learning, where experimentation is almost mandatory for effective learning.

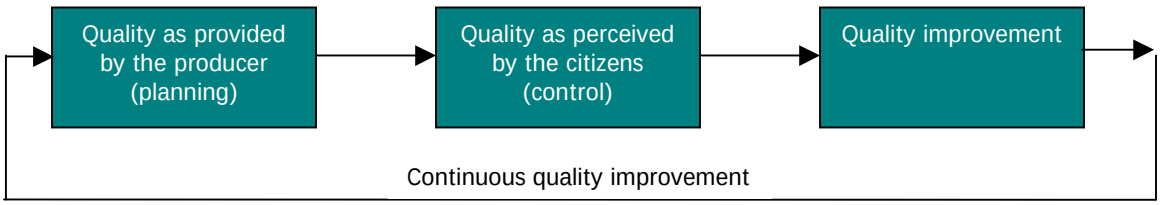
In order to visualize the new combined concept of TQM and organizational learning a model has been developed. The model will be introduced by discussing a model of continuous quality improvement according to TQM, and a model representing single and

double-loop learning from organizational learning. Afterward both models will be combined and integrated.

As discussed previously TQM is about continuous improvement that encompasses three stages. This is represented in figure 1 by a single loop with three stages. These stages are “quality as provided by the producer (planning)”, “quality as perceived by the citizens (control)” and “quality improvement”. The quality loop in this model closely resembles that of the INK-model as discussed by Zuurmond. The INK-model is somewhat more detailed as it focuses on several layers in each stage. Zuurmond distinguishes three stages in the quality loop consisting of more or less similar aspects as in TQM. The first stage concerns the organization itself. Second stage is that of the actual results and the third stage is that of innovation and learning (Zuurmond, 2001). The similarities between the INK-model and the following TQM-model are obvious. Another point of interest is that the third stage of the INK-model, innovation and learning, more than hints at the importance of organizational learning in quality management.

The factors for successful implementation of TQM as mentioned in paragraph 2.2 can be inserted into this model as well. Commitment and an appropriate organizational culture are necessary in all stages of the quality improvement loop. Every stage needs to be backed up by commitment from both management and employees. As far as success factors go, the first and third stages overlap each other quite a bit. Both quality planning and improvement demand a calculated, coordinated and comprehensive approach. In regard to the second stage it is important that quality as perceived by the citizens is actually measured. These measurements are the bases for the third stage.

Figure 1, Total quality management.

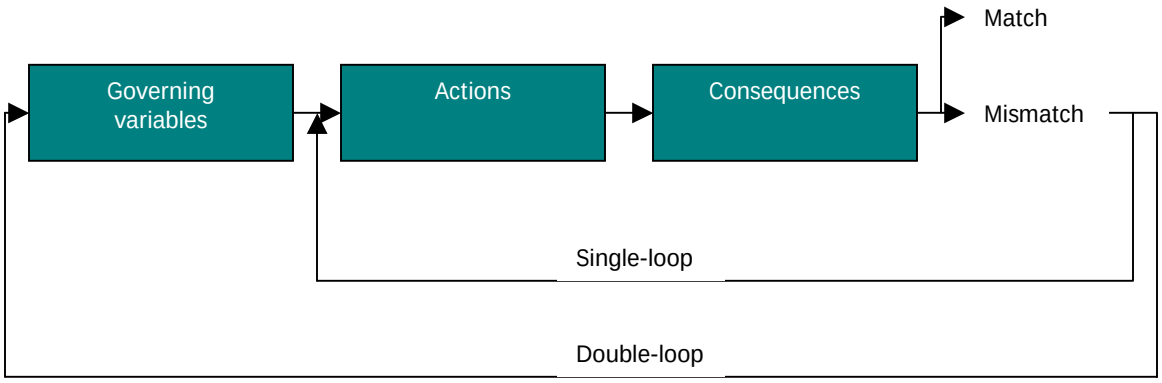


If we put the notions learned from the literature on organizational learning in a graphical representation it would look like figure 2. This model was taken from Argyris’ publication “*On organizational learning*” (Argyris, 1999). The model represents the relation between single and double-loop learning. Within single-loop learning an organization undertakes a certain action, the provision of a service for example. If the consequences are favorable there is a match between input and outcome. In the example of service delivery this would be the case if citizens are satisfied with the quality of the service.

Usually however, input and outcome do not always match entirely. In case of such a mismatch organizations learn from the experience and the loop starts over again. In practice this mismatch usually takes the form of citizen feedback. On a small scale this may be a remark that something on the government's website appears to be inaccurate. The webmaster listens to this remark and changes the page is question accordingly. On a larger scale one may use a survey as done by Fairfax County to gather feedback about what citizens would like to see improved. Fairfax County used this instrument to get a clear picture of what citizens wanted, before redesigning their website.

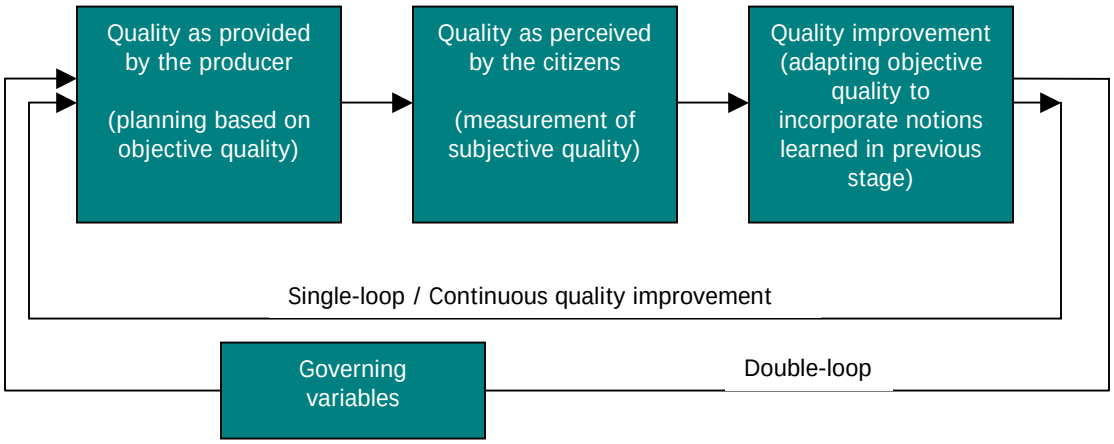
Double loop learning is represented in this model by a second loop that encompasses the single loop. It represents that if input and outcome continuously mismatch organizations need to question the entire procedure represented by the single-loop. Organizations will have to start to think and question the governing variables of the procedure. As will be discussed later, local governments are starting to realize that their existing structures and procedures are not adequate for successful implementation of e-government. This forces them to rethink their way of handling certain tasks and what citizens want from government.

Figure 2, Organizational learning.



These models can be joined together in order to represent an integrated notion about TQM and organizational learning. As said before, TQM basically focuses on the process of what in organizational learning is called single-loop learning. It is about continuous quality improvement within existing structures and governing variables. This is represented in the following model, which incorporates the notions of both TQM and organizational learning. It also shows the notion of objective and subjective quality (figure 3).

Figure 3, integration of total quality management and organizational learning.



As can be seen the entire single-loop from organizational management has been modified to incorporate the notions from TQM. That means that the single-loop now exists of the three stages of continuous quality improvement as mentioned in TQM. Another big difference is that the distinction between match or mismatch of input and output has been removed. This has been done to facilitate the notion of continuous improvement. With organizational learning one might get the impression that once a match between input and output has been established this will always remain the case. One argument to remove this notion is that the context of e-government is changing very rapidly and that matches between input and output will be very rare or even non-existent. The model obviously also includes the notion of double-loop learning, perhaps the most valuable addition from organizational learning to management science.

2.5 Conclusion

This chapter discussed several notions from various schools of management. These notions will help make sense of the data which was gathered through a scan of websites in the Washington, D.C. area and unstructured interviews. Two schools of management were used in this chapter. The first is that of total quality management, the second is organizational learning.

Notions of both schools overlap each other quite a bit, which allowed these notions to be integrated into one model. In this model TQM takes the place of single-loop learning. This provides somewhat more substance to single-loop learning as TQM identifies three separate stages and the notion of continuous quality improvement. Organizational learning in turn adds the notion of double-loop learning to the model, which is lacking

from TQM. Double-loop learning will help formulate recommendations for some of the more complex managerial problems involved with e-government.

However, quality management is not only a matter of improving organizational structures and services. For government, quality e-government can have a positive effect on policy innovation and policy learning. In fact the actual process of improving the quality of e-government is a way for government to do this and thus gain more democratic legitimacy. So, although literature mostly focuses on organizational restructuring, it is important to know that this is “merely” a way for government to achieve the real goals, which are policy innovation, policy learning and better services.

3

In this chapter information quality criteria will be identified using notions from information quality literature. Paragraph 3.1 focuses solely on identifying the criteria. Paragraph 3.2 takes a closer look at the identified criteria to determine the scope of the criteria. Important aspects of the criteria will be mentioned here. Paragraph 3.3 will conclude this chapter, offering a definition of information quality based on the criteria that have been identified.

3.1 Identifying information quality criteria

As far as defining information quality goes, there have probably been as many attempts to define it as there have been people that thought about the subject. This has led to some interesting and varied results. In order to ease into the discussion a couple of definitions found on the Internet will be discussed briefly[1].

"I think that quality isn't simply about adherence to standards, or standing out for that matter. To me, it's about getting the information/message across in the best and clearest way. Note that this says nothing about how many pictures, graphics, color etc. Those elements are in the next stage - where you have already worked out the audience and the intent of the publication material."[2]

This definition conveys very well that no matter how good a site looks, no matter how many bells and whistles it has, when it comes down to it, it is all about the quality of the information itself.

"If I could, I'd like to point out that like truth, information is relative to the individual. What we consider "quality", a more "informed" person may consider rubbish. What we consider rubbish, another may consider golden."[3]

Here we see what has been mentioned earlier. Quality is in the eye of the beholder, which makes defining it all the more difficult. Elsewhere in this thesis certain shared notions about information quality will be identified though. These are separate from subjective thoughts.

"I think that there is also an enjoyment to be had exploring information - particularly when (most of the time) you don't know to what extent the information might be of interest. A website isn't necessarily quality or good, simply because you can get in and out quickly - with or without information. The process of information gathering is also

[1] Info. Quality Definitions, http://www.ciolek.com/WWWVLPages/QltyPages/QltyDefinitions.html, March 6, 2003.
[2] Nicholls, C., Info-Quality-L 1996, "RE: Purpose of Info-Quality mailing list?", 17 Apr, info-quality-l@coombs.anu.edu.au.
[3] Spafford, G., Info-Quality-L 1996, "Information and a General Hello", 03 Apr, info-quality-l@coombs.anu.edu.au.

important, because you can learn that there is more to something than you think... it's not just known content."[4]

This is a very interesting concept. It states that as with mountain climbing it is all about the journey. The result is important, but not as important as the struggle. It sounds very nice and often it will be a very true statement. There are times when results do count though. No citizen will feel satisfied and victorious after spending a day behind his computer trying to make sense out of the maze of online government information and services. That is one mountain no one will ever want to climb. However, it does touch on the notion that the procedure of maintaining and defining quality is as important as the final result. Without this journey, the result will not be quite as enjoyable.

These personal definitions of and views on information quality are obviously highly subjective. They are made by people with their own views about what is needed for information to have a high level of quality. These views are based on personal experiences and needs and are thus different for everybody. This was already mentioned by Bouckaert and Vanderweyer when they discussed the difference between subjective and objective quality (Bouckaert et al, 1999, p.21-26). It is very important to keep this in mind and that subjective quality is what really counts when trying to improve quality. However, organizations need some other way of planning for quality simply because subjective quality is quite intangible and therefore hard to plan for. This chapter aims to provide a workable, objective definition of quality for two reasons. The first is that it may provide organizations with a definition which they can use when planning for quality. The second reason is because an objective definition of quality was needed for a scan of websites in order to be able to gather data about quality at local government websites in the Washington, D.C. area.

In order to develop a workable concept of information quality extensive desktop research has been used. It became apparent that there are quite a lot of sources about information quality available. As expected, total quality management is widespread. Most TQM sources aim at improving business processes or improving product quality. Although some articles did provide useful insights, sources that so specifically aim at the private sector were not used without a healthy dose of caution. Some TQM literature was used, but most literature was of a more fundamental nature. Not surprisingly, a lot has been written by scholars with a background in information technology. This thesis tries to stray away from the technical side of information quality, such as "data warehouse architecture", as much as possible and opts for a more generic approach to defining information quality.

3.1.1 Introduction to information quality literature

Tierno presents a chronological overview of the changes in the discussion of information quality. He looks at four stages through which the definition of quality has evolved over the years (Tierno, 1995, p.230-231). The first was the transcendent definition. It

[4] Nicholls, C., Info-Quality-L 1996, "RE: Purpose of Info-Quality mailing list?", 17 Apr, info-quality-l@coombs.anu.edu.au

basically meant that quality is something that everybody can recognize, but can never truly articulate or define. Although this is probably true, it is also very difficult to work with such a “definition”. Organizations need something with more substance to be able to implement the ideas into their production process. The second stage was the product-based definition. Here, the definition of quality focused on the attributes of products. “The bigger the car, the better it is” is a notion that fits this definition. In services, quality soon became synonymous for volume. The quality of service given by a consultancy firm was measured in the amount of training and presentations the customer would receive for example. In government this process often meant that results were measured by the amount of documents that were produced. Obviously such a definition does not work, as the process itself somehow becomes a goal. Later on, the definition of quality was based on manufacturing. Here the focus was on defining criteria up-front and then meeting them during production. The result was a further standardization of the production process. This standardization can still be useful today, if applied correctly and in the right place. A positive side effect of giving standardized service to citizens is that it makes sure nobody is favored over another. Equal treatment for all is a democratic virtue, so standardization in this regard adds to the quality of the service. The final stage was the user-based definition. Phrases as “fitness for use”, which are quoted elsewhere in this text, belong to this category. The idea behind this definition is that quality is in the eye of the beholder. It is up to citizens to define quality. This of course makes things a lot more difficult for government. Citizens tend to change their ideas and wishes from time to time, something which makes it hard to keep up. But even without this change it is already difficult enough for government to find out what citizens really want. This research and the following discussion fit nicely in this “fourth stage” of quality definitions.

3.1.2 Focus on citizens

The focus on citizens is shared throughout information quality literature. Every source on information quality stresses the fact that quality can only be assessed and measured by its users. For example, English stresses that the quality of information lies in its ability to satisfy users (English, 1999, p.23-24). The emphasis on a user based definition of information quality means that one first has to identify the users of the information before one can define quality. This notion is typical of TQM and, as will become clear later on, information quality literature. TQM goes even further by stating that every employee in an organization must be seen as a customer. Everyone must do his outmost best to deliver optimal quality to the next “customer” in the production chain. This is citizens-oriented service taken to the extreme. Although not every author takes citizens-oriented services to the same extend, they all state that one has to focus on the end-user of the information. It is with this in mind that scientific literature has come up with certain information quality criteria. These criteria are developed from citizens’ point of view and allow for continuous quality assessment. This continuous quality assessment ties in with the model that was presented in previous chapter. Authors often use at least some criteria and terminology that is unique to their research about quality assessment. Although this makes things confusing, it often comes down to the same notion about what information quality is.

3.1.3 No clear definitions

When this research started, it was expected that scientific literature would offer plenty of clear definitions of information quality. Surely scholars had to have been able to deal with this, admittedly difficult, concept? Unfortunately it turned out that this is not the case. Definitions of (information) quality are often very vague. Definitions such as *"Quality is fitness for use"*, and *"quality information is information with characteristics needed to satisfy customers",* are as close to an actual definition as can be found. This is perfectly understandable, as there are a lot of difficulties surrounding the concept of quality. This was already established in chapter 1. Naumann puts the lack of clear, real definitions into words by stating that quality cannot be defined. Instead we have to use criteria to describe it (Naumann, 2001). And that is exactly what scientific literature does. Almost every article found used a set of criteria to define information quality. It soon became clear that this project had to take the same approach in order to result in a workable definition of information quality.

A definition of information quality has to be workable in two ways. First of all it has to be workable in that local governments will be able to implement it and use it to improve the quality of their online information and digital interface. A definition based on several criteria will show governments which aspects of information are important for its quality. This may then be used in development and quality control. Second, the definition has to be workable in regard to this research as it will form the basis of a part of the arguments in this thesis. Both the scan of websites in the Washington, D.C. area and a substantial part of the argumentation is based on the definition of information quality as discussed in this chapter.

3.1.4 Found information quality criteria

Articles and notions of various authors were used to find out what criteria were commonly used throughout literature. The authors of the used literature have their roots in various sectors, including business and science. An interesting conclusion was that almost everyone has a different way of looking at information quality. Although there is more or less an overall consensus about what makes quality information, almost every author uses somewhat different definitions, quality criteria and terminology. Sometimes it is even more confusing when authors use the same words in order to talk about different things, or use different words to talk about the same things. For example, the words criteria, factors and dimensions are sometimes used interchangeably, but at other times they mean completely different things. In order to prevent this, terminology is used consistently in this thesis, even though the authors themselves used different words.

While some authors used four or five, others needed between ten and twenty criteria to define their concept of information quality. It has to be said that using more criteria makes for a more clearly defined concept, but it also means that the definition becomes less workable. It was therefore decided that this project would aim for a limited amount of criteria.

Articles by Clikeman (Clikeman, 1999), Alexander (Alexander, 1999), Miller (Miller, 2003), Wand and Wang (Wand et al, 1996), Naumann (Naumann, 2001), Smith (Smith, 1997), Tyburski (Tyburski, 1997), Basch (Basch 1990) and English (English, 1999) all described notions of information quality using a set of criteria as developed by the authors. These criteria were identified and compared to criteria used by the other authors. By simply looking at which criteria were used most often, commonly used criteria could be identified. These criteria are accuracy, completeness, currency, relevance and accessibility.

This conclusion is largely backed by findings by Wand and Wang (Wand et al, 1996, p.92, table 2). In their research, the authors also used the method of counting the number of times specific criteria were mentioned in scientific literature. They found that especially accuracy, reliability, timeliness, relevance and completeness were mentioned far more often then any other criteria. These findings correlate for a large part to my findings, except for two differences. Reliability is mentioned as a separate criterion, whereas in this thesis it is seen more as an aspect of accuracy. Reliability refers to the fact that citizens should be able to trust the information they read online. The reason why reliability is not seen as a separate criterion is the fact that it is already covered by the other criteria. As long as information is accurate, complete and current people should be able to trust it. Besides this argument, reliability was only mentioned once in the articles used in this research. This combined was the reason why reliability was not recognized as a separate criterion in this project

Another difference between this research and that of Wand and Wang is the inclusion of accessibility as a criterion. This is especially interesting because accessibility is not mentioned at all in the list of criteria as found by Wand and Wang. One would imagine that accessibility would at least have been mentioned a couple of times in the literature used by Wand and Wang. However, if we examine their list more closely we do see criteria such as interpretability, format, usability, clarity and understandability. These criteria all refer to how easy it is to use and understand the information. Accessibility as used in this project covers just those aspects. So, although it does not seem like it at first, aspects of accessibility are found in literature used by Wand and Wang as well. In order to prevent confusion it must be said that literature used in this project also did not state accessibility as a clear and common criterion. However, just as in Wand and Wang's research there was a lot of emphasis on certain aspects that are important to the accessibility of information.

3.2 A closer look at the criteria

The criteria that will be used for defining information quality have now been identified. However, just as there are lots of different ideas about information quality, so are there about the criteria used to define it. This paragraph will focus on the scope and meaning of each of the criteria. It will not try to provide a strict definition of each of the criteria. Remember, this should be left for local governments to establish through feedback from citizens. Notions from organizational learning may help local governments in that final step. Rather, it will introduce a general idea about what the criteria are aiming at. The reason for this is the fact that the criteria should be applicable in many different

situations. These situations range from online government services and communication to basic online government information. In order to do this the criteria will have to be flexible. Providing a feeling for the criteria instead of a strict definition will do just that. This paragraph will introduce general ideas by discussing what scientific literature says about each of the five identified criteria, partly complemented by what was learned through interviews with local government webmasters. Criteria will be discussed one at a time, starting with accuracy.

3.2.1 Accuracy

The criterion of accuracy as used in this thesis incorporates a lot of different aspects. This will be demonstrated by discussing the various angles of looking at accuracy as found in literature. Let's first start off with the basic notion of accuracy. There is one thing most people will immediately think about when talking about accuracy. This is that accurate information is correct information. Accuracy in its basic form refers to the fact that information has to be correct and users should be able to see why they can trust the information. Although this seems straightforward, Wand and Wang show that there is no general agreement over this and that it is a difficult concept to elaborate on. In order to come up with a good explanation of the meaning of information accuracy Wand and Wang introduce a model (Wand et al, 1996). The model consists of a real-world state and the representation of that real-world state by an information system. A real-world state is a collection of valuables and attributes of knowledge about a "thing", as the authors call it. For example, the amount of votes political parties got at an election is the real-world state of the results of that election. Information about the results of the election is accurate if the representation of the real-world state consists of exactly the same values. Admittedly this may be a very elaborate way to talk about something that seems obvious at first. But when defining a concept it is often helpful to make sure it is clear what is being talked about.

The model of Wand and Wang is also helpful for introducing a problem when trying to identify accurate data. Most citizens that visit a government website do not know the exact real-world state. This is why the accuracy criterion does not only concern correct information, but also the ability to recognize accurate information. Information quality literature therefore pays more attention to the indirect assessment of accuracy, than to the actual accuracy itself. One aspect that is often mentioned in this regard is authority. Authority focuses on the credibility of the source. Alexander states that authority aims at whether or not a person or organization is recognized as having definitive knowledge about that subject (Alexander, 1999). To assess the authority of a source one may use several methods. The first is to examine the author's qualifications by looking at his background, experience and credentials. One could also look at the reputation of the publisher. If a publisher is known for the quality of its products, one may assume that this holds for all its products. In order to produce quality a publisher has to adhere to strict guidelines and use quality monitoring. Traditional media use certain checks and balances in order to ensure the accuracy of the information. Such checks and balances may be the use of editors and fact checkers, the peer review process to monitor the accuracy of scholarly journal articles, guidelines for writing etceteras. Of course these checks and balances do not apply to all magazines and broadcasts. The tabloids are

notoriously biased in their opinions, whereas quality newsthesiss such as The Washington Post have a better reputation in regard to offering quality information. Reputation is therefore also very important in the evaluation of information. Because it takes quite some effort to become a well-respected source of information, this is not without good reason. It means that a source has to deliver quality information in order to gain proper authority. It is safe to say that the reverse is equally true. A reputable source is more likely to deliver quality information. Notice that authority or a good reputation does not equal accurate information. An authoritative source may occasionally and unintentionally put out incorrect, thus low quality, information. The change of that happening is slim though, as the source will go to great lengths to prevent such mistakes.

Smith states that the author of a book or newsthesis is often easily recognizable. This does not hold true for online publications (Smith, 1997). Smith points out that most authors share his concern about the trustworthiness of sites. Smith also refers to the relative ease to publish information on the Internet. Everybody with a connection to the Internet can start building a website. To make things more complicated the Internet makes it easy to link to other sites or to use them at a site within a so-called frame. Frames make it possible to use web pages within a web page. This is the reason why it is sometimes difficult to know where the information you are looking at originated. This makes it important to be able to recognize who published the information.

Being able to recognize the author and authority of a source is closely intertwined with the credibility of information. Credibility or trust is yet another aspect of accurate information. People want to be able to trust information. Trustworthy information is the second highest factor out of nine in deciding to visit a website, according to a large scale survey as conducted by Princeton Survey Research Associates for Consumer Webwatch (Princeton Research Associates, 2002). Understandably, Internet users are concerned about the trustworthiness of information offered on the Internet. This means that users seek out the sites that they can trust. Government websites don't do badly and hold the middle as far as users' trust in them, according to PRA's research. Nonetheless, government should pay attention to the trustworthiness of the information they offer. Four out of five users say credibility is very important to them. The third most important factor mentioned by consumers is the ability to identify the sources of information. This survey clearly supports the notions of Alexander and Smith about the importance of authority and the ability to recognize the source of information. Miller uses a separate criterion that is based on al these attributes. This is the criterion of validity (Miller, 2003). Validity of information means that it is possible to check whether information is true. In order to be able to do this people should know exactly those things that were mentioned in the survey discussed above.

Preventing false information is less expensive than correcting it later on (Clikeman, 1999). If prevention fails, the information should obviously be corrected. If, and how quickly this is done after an error is noticed is an important aspect of accuracy according to Basch (Basch, 1990). Important to both prevention and correction is that there are procedures to check the information and that there are ways for users to report errors. This means that there should be some form of editorial check before information is published. It also means that citizen feedback is a valuable tool to manage the level of

accuracy. The model as described in 2.4 clearly shows this cooperation between government and citizens. Without citizen feedback organizations are not able to learn and will thus not be able to effectively improve the quality of services, communication and information.

3.2.2 Relevance

Relevance of information depends heavily on context. It means that the information should offer what the user is looking for. Naumann refers to relevance as meeting users' needs (Naumann, 2001). Obviously this ties in with the notions about quality as found in TQM. Citizens looking for government information may not always want to be bothered by other non-related information. The difficulty here is where to draw the line. A small town with a big community spirit may find that its citizens actually want to see lots of community information on the site, even if this information is not strictly related to government. In such a context it is likely that there are no other sites in a small town that offer those possibilities. In a large city, where people are more individual this might be regarded as unwanted clutter. Focus here is more on efficiency and effectiveness. This immediately becomes clear when comparing the sites of Washington, D.C. and its surrounding municipalities. Although it is not easy to make any clear statement about what is and what is not relevant, it is very important to the success of a site. It is up to local government to find out what works for them by measuring subjective quality. Again an interface between citizens and government appears to be essential in regard to quality improvement. This was also mentioned by several webmasters that attended the Cyberspace.org workshop in Grand Rapids, Michigan at February 28, 2003. One Webmaster commented on the fact that her "Voice from the shelter" pages were particularly successful. These pages showed animals form the shelter that needed new homes. Not at all relevant to government, but citizens liked it very much. Another Webmaster had the same experience with his county directory and in the city of Wyoming a web cam showing the construction of the new town hall turned out to be more successful than the pages with the actual government information.

Relevance may also be based on level of education instead of subject. Government sites in particular face a tough job getting this right. Its users come from all walks of live and the information has to appeal to all. Besides this, the information must also be meaningful. If the information has no purpose or does not make any sense, then it can be regarded as unwanted clutter (Wand et al, 1996).

Some local governments that took part in this research had conducted user surveys to find out what users liked and disliked about their site and to ask what users wanted to be added to the site. According to the respondents this method was very useful. Usually they had also used focus groups to get in-depth information to add to the results of the survey. Although most used these tools during a redesign of their site, some conduct surveys every year to keep track of users' wishes. What citizens look for, why they look for it and what they would like to see added to the site differs almost from person to person. Surveys are a good method of using the new technology in order to improve its quality. They are a prime example of single-loop learning and staying open for citizen feedback.

3.2.3 Completeness

Completeness is the next criterion identified in this research as significant for information quality. A source should offer enough information about a subject so citizens will acquire a well-rounded understanding that satisfies their needs. Incomplete information is often useless. Imagine a summary of upcoming events that states the events, but not the dates and times. Incomplete information can lead users astray or make them avoid using the service altogether. People will not want to use an event schedule without dates and times. It is simply not useful.

Completeness does have its boundaries though. Over-complete information can exceed users' processing capabilities (Miller, 2003). Information that contains too much specific data will be too much for average citizens to process. It is more likely that they will stop reading and will continue to surf the Internet to other, greener pastures. The Internet is notorious for this short span of attention. It is a media based on fast, instant gratification. People want to find information fast and this information should be "bite sized" for fast processing. This means there is some tension between offering complete information at one hand and keeping the information at a size suitable for the Internet. One of the webmasters that gave a presentation at the Cyber-state.org workshop put forward an interesting and entertaining notion in this regard. Maintaining information on their website is a real team effort. Every department has the ability and responsibility to maintain their own web pages. In order to make sure this is done correctly the web team developed some strict guidelines. One of the less strict guidelines was that they told everybody to divide their original text by two and than keep half of the result. However, as anybody who frequently has to make summaries of large texts knows, this is not as easy as it seems.

Completeness also means information has to be unbiased and must show all sides of an issue. Objectivity refers to whether the information is free of distortion by personal feelings or other biases (Alexander, 1999). It is important to understand that no source of information is ever completely free of bias. Therefore it is often important to assess the source's objectivity. Knowing the background and goals of the source is very helpful, if not essential. It is very difficult to evaluate the objectivity of information sources one is not familiar with. The Internet has a reputation of being an easy medium to present opinions, which means that a lot of websites offer potentially biased information. It is therefore important, especially on the Web, that the background and goals of an information provider are clearly stated. It is also important to recognize the fact that the widespread advertising on the Internet may also have consequences for the objectivity of information. This means it has to be clear how a site was funded. Usually this will not be a big concern in the case of government websites, as most funding comes from public sources.

If the information is also available from other sources another question becomes important to the assessment of completeness. Does the information contain all the features of the original, or does it add or lack something? This question becomes important when government information is offered both in print and online. The quality of the information is lowered if it lacks something, since it may not present the full intention of the original. If, on the other hand, it adds something to the original

information the level of quality rises. Smith uses the criterion of uniqueness to refer to this (Smith, 1997).

3.2.4 Currency

Information that is offered on government websites has to be kept up to date. This does not mean that every piece of information has to be updated every couple of days. Information can be up to date for years without any changes made to it. However, information should be updated as soon as its real world context so demands. Obviously, new information should be put on the website as quickly as possible. Basch discusses the frequency of updates (Basch 1990). He remarks that especially time-sensitive information should be updated more often. Contact information in particular needs extra attention. People join or leave an organization all the time, or migrate to other departments. If their contact info is not updated accordingly it becomes useless to citizens. It is important to remove or archive information that is no longer current. For example, it is not a good idea to keep old minutes of council meetings on the front-page. A better solution would be to archive it on a separate page so the front-page will stay current.

In order to show citizens that the offered information is current, it is important to mention when information was published. This means a revision date should be visible on every page. It may be important to look beyond the publication dates. For statistical information it is important to mention when the data was collected for example. Especially on the web it is difficult to determine the currency of information. When there is a date mentioned it is not often clear if this is the date at which the information was created, the website was revised or the information was placed on the website. Both Smith (Smith, 1997) and Alexander (Alexander, 1999) comment on this. Updating information on the Internet is easy, which should have a positive effect on the currency of information. The drawback of this is that it is difficult to keep track of all the versions and changes. This makes showing the proper dates of information revisions even more important.

Information currency is not always dependent on context. Changing user perceptions may also have an impact on currency. If information is not updated whenever user perceptions change, the information will lose its currency (Miller, 2003). This again shows just how important it is to keep an open dialogue with citizens. When user perceptions change, so will their comments and remarks. By taking notice, online information can be updated and changed according to changing user needs.

Timeliness of the information should also mean that information is available when the user wants or needs it (Clikeman, 1999). For example, the agenda for committee meetings should be available some time ahead of the actual meeting. After that it will not be of much use anymore. If a website offers dated information nobody will come back to visit it, as it will be useless to him or her. This means that governments will have to communicate with citizens about when they would like to receive certain information.

3.2.5 Accessibility

Accessibility refers to the ease of use, readability of text and format. Users should be able to access information without the need for a lot of technological knowledge. If a user is not able to easily access otherwise high quality information, he will not be satisfied (Miller, 2003). E-government is a medium through which to communicate information from government to citizens and vice versa. In order to exchange the information as it was intended, the medium has to be easy to use and accessible.

The format of information is about its presentation to citizens (Miller, 2003). Format consists of two aspects. The first is the underlying form of the information. Depending on who is going to use the information one may choose for text, tables, charts etc. On government websites information is usually offered in text, although sometimes charts and tables are used to convey things such as census data. Regardless of format, the content obviously has to be well written (Smith, 1997). Only through well-written text may the content be communicated clearly. Charts and tables also have to be "well-written". They should be understandable and easy to use so everybody can understand the information they contain. The second aspect of format is its context for interpretation. Citizens are a broad group of people that have different levels of education, different interests etceteras. The context of a government website therefore demands that information is presented in understandable, readable text. The format of the text should make it accessible to a wide variety of people. A dialogue between citizens and government should used to find what works for a certain local government. Again, it is subjective quality that counts.

Smith gives a lot of attention to the criterion of workability, which is closely intertwined with the format and context of information (Smith, 1997). The interface between citizens and government should be convenient and effective. There is a close relationship between how citizens perceive quality and workability. Interviews held with local government webmasters showed that a lot of citizen feedback is about the workability of a website. For example, citizens often seek contact because they are unable to locate the information they want. A site should therefore be user-friendly. User friendliness refers to a broad range of aspects that affect the experience of using a site. Sites should also be accessible for disabled people. This is especially important in regard to government websites, since government has to make sure everybody gets the same level of access to its information. An often-used evaluation tool is Bobby[5]. Bobby tests web pages for accessibility, according to certain standards developed specifically for that task. The more information is available, the harder it gets to keep it all easily accessible. This in itself is a good reason to make sure information is relevant. Irrelevant clutter keeps users from easily accessing the wanted, useful information (Wand and Wang, 1996).

The best sites all have a standard look and feel. The most important aspect of this is that users will always be able to find important menus and links at the same spot on the page. This provides users with an easy point of reference if they find themselves lost at the site. Links and menus should be organized according to how citizens look for

[5] http://bobby.watchfire.com/

information. Citizens often do not know the inner working of local government. A common error is that sites are organized according to departments. It is better to use links that are logical to citizens by using categories such as “permits”, “council minutes”, “community news” etceteras. Providing a separate alphabetical list of links to all services and information often turns out to be very useful. Finding out what makes a logical organization of content is something that has to be learned in cooperation with citizens. This aspect also shows the changes that will have to take place in organizational procedures. Procedures cannot remain organized according to departmental structure because of the characteristics of e-government. With so much integration of information and content, government will have to adapt its procedures to fit the new way of communication and the provision of services and information. This is one area where government will have to start questioning the so-called governing variables.

A final thought about accessibility refers to the presence of customer support in regard to accessibility (Basch, 1990). Customer support is a valuable tool to help citizens that have problems accessing the information and services offered on a government website. This thesis provides arguments about why citizens should be integral to e-government operations. The same interface used to enhance the quality is at the same time a very convenient way to offer support. Of course, the difficulties that citizens communicate this way are a prime way for an organization to learn and adapt.

3.2.6 A generic aspect

There is one final aspect that, according to Alexander and Basch, is important to all criteria. People want to know what to expect. Information quality should therefore be consistent (Alexander, 1999 & Basch, 1990). This means that there should not be any lapses in accuracy, relevance, completeness, currency and accessibility. If there are too many drops in quality, people may lose trust in the site and start avoiding it. This trust is lost because people do not know when to believe the information if they know its quality is inconsistent. They simply do not know when the information is high or low quality. Information should consistently be of high quality so people do not have to worry about aforementioned lapses. During the interviews that were held with key figures in local government it became clear that maintaining a consistent level of currency is hardest of all. In order to maintain a consistent level of currency content has to be checked and updated constantly, which can be quite a lot of work. Websites quickly evolve to include hundreds or even thousands of pages. Checking every single page on currency takes a lot of time, of which there is usually not a lot.

3.2.7 Overlap between aspects

By reviewing above criteria it also becomes apparent that the aspects do not have clearly defined outlines. In most cases there is overlap between aspects. There usually exists a close relation between several criteria or aspects. Some aspects are not always important or relevant to just one criteria. Although literature assigned certain aspects to certain criteria, logical reasoning shows that they are often important for other criteria as well. Another example that can be mentioned is the importance of currency on other

criteria. Information does not have to be current for the sake of it. The criterion is there to ensure information will not go out of date and thus will become inaccurate or irrelevant.

This research uses the distinctions that are made in literature for the purpose of clarity. The distinctions greatly helped when reviewing websites for possible problems regarding information quality. But, once again, it is important to keep in mind that all criteria are somehow linked to one another, which is why the aspect of consistency that was mentioned earlier is so important.

3.2.8 Criteria and organizational learning

Improving and maintaining the quality of these criteria is mainly a case of single-loop learning. Once the correct structures are in place the quality of the digital interface between government and citizens can be improved by continuous quality improvement in the vein of TQM and single-loop learning. As was argued in paragraph 2.4 single-loop learning fits the notions of TQM well. Because information quality criteria are subjective notions, stage two in the loop is all important for most of those. Especially relevance, completeness and accessibility require continuous feedback from those who matter most, the citizens. This is due to the fact that notions about what is relevant, sufficiently complete and accessible are constantly changing. Also the fact that it is very hard to judge upfront what citizens' needs are makes citizen feedback vital in delivering quality online services, information and communication.

For all criteria the continuity of the quality loop is fundamental in delivering a decent service, even regardless of quality. Currency for example depends completely on continuous updates. It is inherent to that criterion, as without continuity information will loose its currency very rapidly. In fact, improving quality in that regard depends on the rate of the actual quality loop itself.

In regard to accuracy and objectivity, an aspect of completeness, stage one of the quality loop is also highly important. Both require careful planning, implementation and a certain focus on quality control. As Clikeman put it and as has been mentioned earlier, preventing false information is better than correcting it later on (Clikeman, 1999). Objectivity requires an attitude of not wanting to abuse information to gain benefit from it. This in turn is part of a citizen oriented notion of quality management. After all, it is not in citizens' best interest to be treated to biased information.

Double-loop learning is not really an issue as far as maintenance of quality goes. Double-loop learning is more important when actually installing the necessary organizational structures for maintenance of quality e-government. Especially when local governments first venture into the use of e-government double-loop learning comes into play. E-government requires necessary changes throughout the entire organization. Old structures no longer suffice and responsibilities and accountability will have to be redistributed. These changes call for a re-evaluating of governing variables.

3.3 Conclusions

Once again it has become clear that information quality is a complex concept with lots of aspects. This chapter focused on finding a workable definition of objective quality that can be used by organizations for planning, and which could be used during the scan of local government websites in the Washington, D.C. area. Several information quality criteria have been identified and discussed in detail in this chapter. This provided answers to the first research question and part of the second.

The answer to how we can define quality in regard to information and services offered by local governments to its citizens through websites would have to sound like this;

Information quality is the combined result of the accuracy, completeness, relevance, currency and accessibility of information. Information with a high level of quality is therefore accurate, complete, relevant, current and accessible. These criteria should be considered in a broad sense, which makes them applicable to many situations.

In order to further use this definition as a basis for reviewing websites it had to be broken down to various important aspects. These aspects were discussed in paragraph 3.2. It became clear that there is more to the criteria then expected at first. Since some criteria are intangible and subjective, literature often offered indirect ways of reviewing or scanning those aspects.

The various information quality aspects are not isolated. Relations and overlap exist between them. A change in one aspect may have consequences for other aspects. Although this research will use a model of information quality using the isolated aspects as discussed in literature, it is important to understand that information quality really depends on a web of relations between various criteria that influence each other.

Single-loop learning, or TQM, is necessary in order to maintain these criteria at an appropriate level. Whereas this definition of information quality may be useful for planning, it has to be clear that quality is a subjective notion. As such, subjective quality as measured amongst users and citizens should be the real guiding principle. Quality management based on any definition of objective quality will most likely never reach an appropriate level. The quality loop that is inherent to single-loop learning or TQM is therefore very important, as measuring citizen feedback is one of the key characteristics of that approach. This was discussed in paragraph 3.2.7 as well. Government on its own is not able to this attain insight into what citizens want.

4

In this chapter results from a scan of information quality criteria, as identified in the previous chapter, on local government websites in the Washington, D.C. area will be presented. Paragraph 4.1 deals with some of the issues and problems involved with a scan of subjective notions such as information quality criteria. In 4.2 the results of the scan will be discussed one criterion at a time. These results will be linked to notions from organizational learning in paragraph 4.3, after which the most important notions from this chapter will be summed up in paragraph 4.4.

4.1 Scanning information criteria quality

In order to say something sensible about current e-government practices, websites were scanned for the quality of the criteria identified in paragraph 3.1. The results from this scan proved valuable for analyses after they were linked to the results from unstructured interviews with local government officials. The results of this combined methodology could be linked to the model of organizational learning and TQM as described in paragraph 2.4. This in turn provided valuable understanding of current practices and problems and offered possible solutions and ways of thinking about quality management. The results of both the scan and the interviews helped position single and double-loop learning as ways of quality management in e-government.

The sites that have been scanned are listed in appendix 2. These are sites from local governments from Washington, D.C. and the surrounding counties in the states of Maryland and Virginia. There has been no focus on one particular type of local government. Town, city and county websites have all been scanned. The differences between these websites were quite obvious. Larger local governments often have more budget and usually bigger sites with more content and services. These differences presented no problems in regard to methodology. The goal of the scan was to learn about possible difficulties that local governments face in regard to information quality of e-government. As will be discussed later, scanning various types of local government actually proved valuable as large and small governments often face different problems. The selection of these websites for the scan was therefore purely based on location.

There are a couple of difficulties involved with reviewing information quality from citizens' point of view. The first is the fact that information quality is a subjective concept. As has been said repeatedly throughout this thesis, quality is in the eye of the beholder. This poses difficulties when trying to make statements about the information quality of websites. Arguably the best way to do this would be to conduct a large-scale survey among citizens and ask them about their opinion on the level of information quality on certain websites. However, in order for this method to be successful many resources are needed. It was soon decided that an in-depth evaluation of information quality on local government websites was not a possibility due to time constraint and the scope of this thesis. Instead the choice was made to review or scan websites for identifiable problems in regard to information quality.

Very small sites were viewed entirely. With other sites the sample size depended on size of the site itself and how many pages it took to get a reasonable idea of the level of

quality. Another reason why there was no predefined sample size was because sites differed in more areas than size alone. Site structure was different on almost all sites, which meant that it could not be predetermined which pages to scan or how many.

Although the scanning tool that was used can be examined by flipping to appendix 1, that alone will not clarify the purpose and meaning of some of the questions. Since the tool is used to review complex concepts, and it often does so indirectly, an elaboration on its use is necessary. This elaboration will not go into as much detail as to discuss every question the tool consists of. Rather, it will point to certain key characteristics such as the indirect way of measuring that is sometimes used.

4.1.1 Scanning for problems

As was mentioned earlier, the identified information quality criteria are mostly intangible notions that are not easily measurable. The problem of measuring accuracy has been touched upon in paragraph 4.1. Accuracy cannot be measured directly because that would require knowledge of all the facts the information is based on, the so-called real-world state as discussed by Wand and Wang (Wand et al., 1996). This is not possible, which means one has to find ways to measure accuracy indirectly. Articles like the one by Dragulanescu show that it is possible to measure whether sources are likely to be accurate (Dragulanescu, 2003). Sources that are authoritative and have a good reputation are more likely to publish accurate information. This is especially true if the sources provide ways to contact the authors or to check up on information through references. This approach calls for some assumptions about the authority of government. In this research the assumption is made that local governments are authoritative in regard to government information. The logic behind this is that the source and topic of the information are the same. This in turn leads to the assumption that government information on local government websites is likely to be accurate. This means that it has to be sufficiently clear to citizens that they can trust the information on the website. Obviously authority is very important for the indirect identification of accuracy. It should be possible to recognize the author or the responsible department. The information should originate at the proper source. For example, not the fire department but the police department should maintain a crime bulletin. This is an over the top example, but it makes the point clear.

Fortunately relevance can be measured more directly than accuracy. One could focus on whether the information is aimed at residents, visitors and businesses. These questions are quite straightforward and direct. Another way is aimed at identifying metadata about relevance. These focus on whether it is possible to find out about the intended audience and scope of the website. Websites may offer this kind of metadata through introductions and separate pages with information about the website.

Evaluating completeness in the sense of offering all available information and all aspects that are relevant to the information unfortunately suffers from the same problems as accuracy. In order to accurately measure this, one would have to know how much information is out there and how many aspects there are to certain topics. This is not possible, which means the evaluation tool has to focus on other aspects relevant to

completeness. Of all information quality criteria, measuring completeness is probably most susceptible to subjectivity. With other criteria it is possible to narrow down the focus of what is measured. Completeness on the other hand is hard to operationalize into focused aspects. One may review things such as level of detail and whether or not a website is rich on content. Here level of detail is considered the amount of facts relative to the amount of text. This can be too high and make it difficult for users to process the information. It can also be too low, which means the content doesn't really offer any information. The question whether a site is rich on content may be answered by looking at the amount of pages and the amount of content found on those pages. Of course websites of small towns offer less content than a website such as that of Washington, D.C. Another aspect of completeness is whether information offers a well-rounded argument and is unbiased. Things to look for in particular are whether information remains factual. For example, information can either stick to information about meeting schedules or offer a story on how beautiful life is in this particular town. There is no predefined method of assessment, but a critical eye can usually spot whether information is relatively unbiased.

Fortunately currency can be measured more easily than accuracy, relevance and completeness. Unlike those criteria, currency can be measured directly and is less prone to subjectivity. The reason for this is that the indicators for currency are recognizable and well defined. In order to see if a page gets updated frequently one only has to look at how far apart updates of time sensitive information have been. Broken links are also easily recognizable, as is the presence of a date of last update. Measuring currency can therefore be done much more objectively.

It gets harder when the website does not offer any objective indicators of currency. If a publishing date is not offered with an article, its currency may be judged by taking the "freshness" of the information into account. For example, if information on snow removal is still found on the main page in the midst of summer, that is a good indication that the information is not current. However, it must be said that the absence of currency indicators in itself is reason enough to doubt the quality of certain aspects of the information.

Accessibility of a website is the sum of many different aspects. In a way this expands the possibilities for measurement. A lot of these aspects can be easily identified. They can be easily pointed out by browsing the website. An example of this is the availability of contact information. This easy division into small aspects and easy identification of those aspects mean that measuring accessibility is not as difficult as measuring an intangible concept like completeness. This has implications for the objectivity of measurement. Whereas evaluation of completeness largely has to be based on solid argumentation, accessibility can be measured by pointing to the presence of certain aspects. However, argumentation will still be important to provide descriptions of how well the aspects have been implemented. Websites are not either accessible or totally inaccessible.

4.2 Results of scan

The scan of the Washington area local government websites (appendix 2) provided lots of interesting data. Some common practices were identified, which if properly addressed could mean a significant improvement of information quality. Unfortunately, in some cases subjectivity proved harder to avoid than anticipated, which had consequences for how these results could be used in this thesis. First of all, it has to be clear that these results cannot be used to make any generalizations about the current state of information quality. However, the scanning tool did provide nice descriptions of aspects that are relevant to information quality. These pointed out some of the problems on websites that have an influence on the quality of online government information. Some of these problems appeared to be quite common and can often be linked to procedures or rigid organizational culture. Again, the scan was in no way meant to deliver a generalization of the state of information quality on local government websites in the Washington, D.C. area. However, as a means of identifying some of the problems that webmasters are facing the scan was quite successful.

In this paragraph the identified problems will be discussed in depth. As has become the norm throughout this thesis, this will be done one information criterion at a time. The identified problems will be described, after which its consequences on information quality will be elaborated upon.

4.2.1 Accuracy

As was said before, it is not possible to measure accuracy directly and objectively. This is not only true for this project, but for citizens as well. Citizens will not be able to know whether what is offered is accurate either. It is therefore important that government websites show that information on their site can be trusted. This should be done by stating governments' authority on government information. Although this seems straightforward, the evaluation showed that a lot of government websites do not state that the site is an official government website. Most sites are recognizable as such by examining the type of content offered, but an introduction, statement or page about the source of the website would not be overly luxurious. Even a simple header, footer or title could go a long way to installing more trust in the user base.

Other ways to show people they can trust the information were also lacking on most sites. Online government information rarely states the source and author. Only in cases of large reports or articles are authors stated commonly. Letting people know that the information was prepared by somebody who has knowledge about the topic could be a valuable way to communicate authority. Even just stating the responsible departments could be very helpful.

4.2.2 Relevance

Metadata on relevance was surprisingly absent. One would expect websites to offer introductions or pages about the scope and intended audience of the website. Although

some did, most did not. This meant that the content had to be examined to find out about scope and intended audience.

Relevance, in regard to the kind of information that is offered on government websites, seems to pose no problems. Almost every evaluated government site seems to naturally keep things focused on either the community or, what is often the case, strictly government related. Of course, there are differences in details. One site may offer a directory of local businesses, whereas another may not. Some citizens will like such a directory, others will not. The evaluation therefore mostly focused on the broader picture. That is, whether the site offered community or government related information.

As expected, small town websites tend to offer more community information. Part of the reason may be that small towns appeared to have little to offer as far as strict government information is concerned. Another likely reason is that small town government websites perform a role that nobody else will fulfill. Cities and counties are often the focus of more than one website. This means that the government website can stick to offering strictly government information and leave community news up to the other websites. In a small town, the government website is usually the only means to get news about town events out onto the Internet.

So, as far as relevance of topics is concerned everything seems to be in order. However, relevance in regard to level of education appeared to be problematic on a large number of the local government websites in the Washington, D.C. area. A lot of information that is offered on local government websites suffers from the same notorious use of difficult language as traditional thesis government reports do. Big words and government jargon appear to be very common, which may pose difficulties for some people trying to understand what the information tries to tell them. This really ought to be addressed. Unfortunately, this is what people have been saying about traditional government reports for a very long time as well.

4.2.3 Completeness

One thing that can be stated safely about the level of detail on the evaluated websites is that the results were very varied. When comparing sites it became apparent that there are sites that have a relatively much lower level of detail and that there are sites that have a much higher level of detail. The bulk of sites have a level of detail that can be found in between. These statements do not say anything about actual levels of detail because of the subjectivity involved. However, they do show that this aspect of completeness should not be overlooked when publishing online government information. Focus groups could be used to find out what level of detail works best for a particular website. According to some webmasters that have been interviewed for this research, focus groups have provided them with valuable citizen input.

Another aspect that was scanned is whether information appeared to be biased or not. Fortunately, most information on local government on appeared to be unbiased. After all, it is very hard to put political messages in timetables, schedules and other related information. Note that “unbiased” is considered equal to “based on facts” in this project.

It has to be acknowledged that this is not ideal. Facts can be falsely interpreted or only part of the facts could have been presented. This is where trust and authority come into play again. As was stated before, this research makes the assumption that government is authoritative and information on government websites is therefore likely to be trustworthy.

What can be said about the amount of information on websites is more or less the same as what has been said about the level of detail. The results vary greatly. Some websites offer only a couple of pages of static, brochure-like content. These sites are used to introduce officials, present contact information and offer some information about government's activities. Sites like that are more common amongst small towns, which makes sense considering the amount of information and resources available. Other sites are absolutely huge as far as amount of pages and content is concerned. Logically these sites were usually found amongst larger governments such as counties and the D.C. government. These sites usually contain more dynamic information such as news items, road construction information and what not. Small sites usually lacked online services. Some featured online forms that could be printed, but the kind of interactivity that can be found with the big boys was not found.

4.2.4 Currency

Currency seems to be one of the biggest problems in maintaining a local government website. A lot of sites seem to receive updates infrequently, once or twice a month or even less. These updates focus on time sensitive information such as news items, but often do not affect any of the other information on the site. This results in out-dated content. Available council minutes are sometimes months behind, much more than the average time it takes to have them approved. Static information is often overlooked. On certain occasions pages dating back to 1995 were found! Although a lot of sites seem to suffer from this, a few were simply horrible in regard to currency. These sites had not been updated for a long while, even to a point where they could better have been taken offline. Fortunately, these examples of bad practice are exceptions. Most sites do struggle however. Even if the content is current, freshness is often lacking. Fortunately there were also some really good practices as well. Usually these were found at the larger governments with the bigger budgets. Those governments are able to hire full-time people or install content management systems that simplify the process of maintaining and updating information. However, these findings do not imply that all large governments offer current online information. Some large governments struggle just as hard as some of the smaller governments, or even more because there are more pages to maintain.

It is not difficult to understand why these problems exist. Keeping a site current takes a lot of resources. Many of the webmasters that were interviewed during this research commented on this and the fact that they're already struggling to get the information out there in the first place. However, currency should simply not be a low priority as far as information quality is concerned. This presents a huge problem that needs to be addressed. More on this will be discussed in the next chapter.

4.2.5 Accessibility

One aspect of accessibility that helps clarity a lot is consistency of layout. A consistent layout means that citizens only need to find out how to navigate one page to be able to easily navigate other pages on the website as well. Citizens will be able to put less effort into the workings of a web page and focus on the actual content instead. Some sites already adopted a consistent layout. Unlike what might be expected, these sites are not concentrated among large, wealthy governments. They seemed to be evenly distributed, regardless of size or budget. However, the amount of truly consistent sites is still relatively low. More common are sites that use a semi-consistent layout. These sites usually have a standardized navigation menu, header and/or footer that are used on every page. The actual content however does not have a consistent layout. Sometimes entire websites are simply inserted in between the standardized header and footer. This is often the case when departments maintain their own pages and start developing a style of their own. This nested site approach decreases accessibility and clarity very much. The entire idea of a consistent layout is turned upside down and becomes contra productive. A consistent layout can definitely mean a huge increase in accessibility and clarity, but when implemented improperly it can have negative consequences. It therefore requires strict adherence to layout guidelines.

Navigability of a website is also greatly enhanced by a consistent layout. As was said earlier, a consistent layout helps people identify navigation menus. Once they know where to find them on one page they will be able to find them on any page. It will also help to implement a standardized system of browsing the site. On some of the sites that were visited menus could be found at the same place on some of the pages, but went missing on others. This is very confusing for users. Consistency should therefore be adhered to strictly.

In order to help citizens locate government information online, websites should be organized according to citizen logic. Citizens do not know the intricacies of government structure and as such do not know where to go to get certain information or use a certain government service. This can be solved by providing citizens an user-friendly way of locating information. This can be done in various ways. Some sites offered an alphabetical listing of information and services, based on phrases that citizens understand. Some sites, (also) used a distinction between residents, businesses and visitor areas. Here information can be found that is relevant to those groups. Although quite a lot of sites appeared to try and implement such a design, only a few are actually successful. A lot of sites are still stuck in government structure. The information found on those sites is still organized along the lines of that structure, which basically is a maze to most citizens. However, a lot of good examples of possible solutions are already out there, so this is not impossible to overcome.

Part of the accessibility aspect does not really focus on the information itself, but more on the accessibility of the organization behind the information. The Internet provides is a wonderful medium to distribute information to a large amount of people. It also offers new ways to communicate, of which the most popular is through e-mail. This use of the web apparently is well known and widespread. A lot websites offered extensive contact information. Many e-mail addresses and phone numbers can be found on those sites.

However, apart from the easy to implement listings of contact information there was little opportunity for citizens to contact government or to participate actively in the policy process through e-government. Places for discussions, chat meetings or web-surveys were missing. It can therefore be argued that although possibilities for communication are available, they are still at a very basic level and do not use the full potential of e-government. This is a shame, because the few local governments that remarked on occasionally using user feedback groups and web surveys mentioned that these methods for measuring subjective quality were very valuable.

4.3 Connecting identified problems to organizational learning

At this moment these results on their own might prove valuable for local governments. Linking them to ideas and notions about quality management however may yield more advantages in the long run. Because existing problems may change in a short span of time in a dynamic environment such as e-government, it is more interesting to focus on the underlying managerial principles. At this point this will still be limited to notions from single-loop learning and TQM, as a scan of websites does not reveal enough to discuss the problems in regard to double-loop learning.

The scan focused mainly on indirect ways of measuring information quality criteria. They therefore show for a large part the implementation of “best practices” as discussed in paragraph 3.2. The problem with these best practices is that not everybody identifies those as such. Not surprisingly, a lot of the best practices were thus completely or partially missing. Whether those theoretical best practices will eventually end up on more websites should depend entirely on citizens’ needs. There are fortunately signs that single-loop learning is already being used to learn about best practices. Many government webmaster associations exist throughout the United States, including Maryland and Virginia. These associations provide methods of collaboration between government webmasters, through which they are able to share experience and knowledge. Usually this is done frequently via email or discussion boards and the occasional annual meeting.

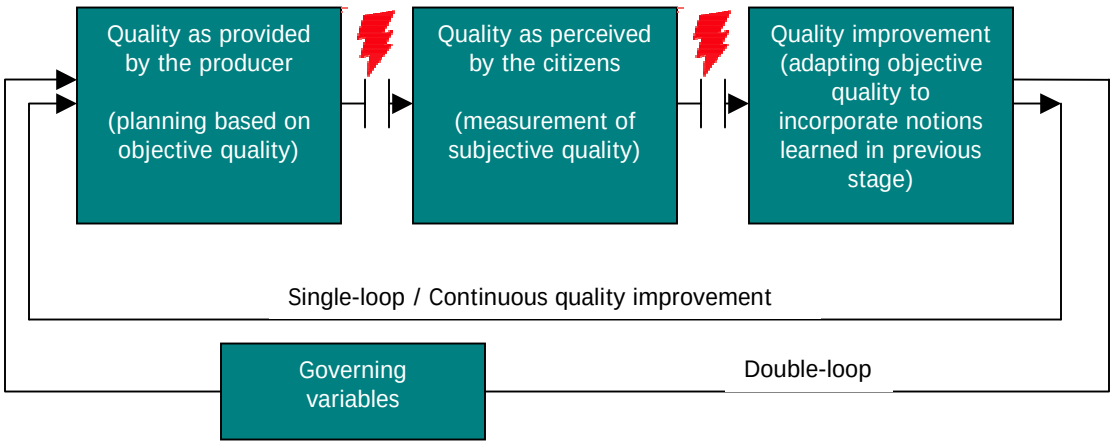
It is without a doubt that a lot of criteria could benefit from continuous quality improvement. The most noticeable example is the problem with currency that seems to be somewhat widespread. Obviously a lot of sites can do with more frequent updates, which in its own is a practice of continuous quality maintenance. Single-loop learning and continuous quality improvement appear to be much needed in improving the quality of e-government as the scan showed that this still has some way to go.

The results as identified in paragraph 4.2 also hint at more fundamental problems that are probably harder to overcome and for which continuous quality maintenance is not well suited. Especially the low amount of truly consistent websites provided clues early on that the necessary structures needed to support e-government initiatives are not always in place. Government websites that are more a collection of various departmental websites sewn together by a front page indicate that e-government is not always coordinated organization wide. The quality of the e-government initiative in those cases is often hindered by well known bureaucratic dysfunctionalities such as departmental

silos, resistance to change or simple lack of communication. In those cases double-loop learning may prove to be necessary in changing organizational culture and structures. This was also found after analysis of the results gathered by unstructured interviews, which will be discussed in the next chapter.

First, let's point out which problems could be identified in the conceptual model that was discussed in chapter 2 (figure 4). These are not all problems in regard to information quality management, but only the ones identified through the scan of local government websites in the Washington, D.C. area. The place where these problems manifest in the model has been marked by a symbol and a discontinued arrow. As is immediately clear, problems that have been identified using this tool concern the quality of information as provided by government. Lack of best practices, currency and consistency all hint at organizational problems in stage 1 of the quality improvement loop. Problems this early in the quality improvement loop have repercussions in the following two stages. For example, the problem with consistency, an aspect of accessibility, may prevent citizens from giving valuable feedback.

Figure 4, conceptual model and identified information quality criteria problems.



In regard to the basic level of possibilities for communication the quality improvement loop is frustrated in stage 2. Here government misses out on the full potential citizen feedback through the digital interface. This means that measurement of subjective information is lacking. When this is the case, government cannot optimally adjust objective quality according to what was learned from citizen feedback. This has also been visualized in figure 4.

4.4 Conclusions

Scanning local government websites in the Washington, D.C. area (appendix 2) has yielded lots of valuable results. These results are a mixed bag. They show areas where e-government performs reasonably well, but they also show areas where it falls short. In any case, there are still a lot of things that need to be addressed. There are lots of possibilities for improvement and it would be a waste to ignore those.

For most problems it can be argued that one can trace them back to procedures and organizational culture, as has been touched upon briefly in 4.3. In those cases single-loop learning is not likely to deliver as the problems are more of a fundamental nature. If these problems are not solved this will hinder otherwise effective ways of improving quality. Whereas quality improvement may be attained on a small scale, the overall e-government initiative will remain at a low-level of quality as organization wide communication and coordination is necessary when dealing with a network–based service. Double-loop learning is more suited to those situations as it allows an organization to question its existing structures, procedures and way of thinking.

Some problems that can be traced back to rigid bureaucracy have been identified and discussed in this chapter. It has to be clear that it is unlikely that this is an exhaustive list of problems. Other problems may be found on other websites. These problems however seem to be quite common and will therefore be the focus throughout the next chapter. They provide a good way to integrate the discussion about e-government with organizational learning and the notion of double-loop learning in particular.

5

This chapter will focus on the management aspects of maintaining online information. Especially rigid bureaucracy will be discussed in depth according to the notions from organizational learning and double-loop learning in particular. This chapter will focus more on the role of subjective quality in the quality improvement loop, as opposed to the focus on objective quality in the two previous chapters. The inside-out approach as announced in paragraph 1.3 will be a guiding line in this chapter. It starts off with a focus on local government websites, after which it broadens to incorporate the supporting organizational structures and then ends by discussing the importance of government-citizens relations.

5.1 institutionalization of e-government

As was said in chapter 2, organizational learning has been one of the key notions throughout this thesis. Organizational learning offers a lot of useful insights in a context where one has to deal with such a vague and subjective notion as information quality. In this chapter theory from chapter 2 will be linked to empirical results from various interviews with webmasters of local governments in the Washington, D.C. area. The model presented in paragraph 2.4 will be used as a red line.

Interviews were conducted with webmasters and other people involved with maintenance of online information. These people worked for several local governments in the Washington, D.C. area. In total twelve people have been interviewed, all working for one of the nine local governments that have been visited. These local governments were Arlington County, Fairfax County, Montgomery County, Washington, D.C., City of Fairfax, City of Greenbelt, City of Rockville, City of Takoma Park and the Town of Vienna.

The main reason for such a diverse collection of levels of government was purely pragmatic. As an exchange visitor for six months, it was awkward to get around. Without a car, public transportation was the only option. This meant that only local governments in the vicinity of Washington, D.C. could be visited. In order to get a reasonably sized sample the decision was made to visit various levels of government.
An advantage of visiting different levels of local government was that it offered information about the influence of amount of resources and size of the organization, which turned out to be very interesting.

Although literature discusses double-loop learning often after introducing single-loop learning, here it will be the other way around. This has to do with the fact that local governments that want to implement e-government almost always seem to have to deal with double-loop learning first. Double-loop learning allows organizations to response correctly to changes in the environment, for example by changing structures and procedures according to newly developed needs. As was mentioned before, this usually goes hand in hand with conflict and defensive measures from members of the organization. However, it is something to be dealt with, otherwise said structures and procedures will remain inadequate and quality of the new technology will remain sub-optimal. Double-loop learning allows organizations to get the necessary structures and

procedures in place through experimentation, trial and error. In this stage it is therefore important that structures and procedures are not to rigid.

As noted before e-government is one of those changes in environment that sparks organizational learning. E-government is a network-based technology. This means that the entire organization has to be mobilized for it to be truly successful. This in turn means that the entire organization will be affected by the changes it brings about.

5.1.1 Awareness and e-government

The gathered data from the interviews shows that one of the main difficulties, faced by webmasters and local governments, is acceptance and incorporation of the new technology in the organization. At the Cyber-state workshop in Michigan webmasters presented cases from their personal experience. These cases often revolved around webmasters' endeavors to create websites while at the same time dealing with a lack of cooperation from the rest of the organization. In practice this often means that departments show little interest in offering content for the website. In a lot of these cases the government website often started out as and to some extend still is a one-man endeavor. Sometimes a person even decided on his or her own to start a website about government information. One webmaster who attended the Cyber-State conference even started on his personal ISP web space. These sites slowly but surely expanded and eventually got some official support from the government. However, webmasters often still have to constantly motivate other people and departments to cooperate and offer information. This has all to do with the level of ICT awareness in the organization. Webmasters in this role of stimulator often find themselves in a situation where the organization has not yet (fully) made this important step towards awareness.

A lot of webmasters mentioned this lack of awareness among the departments. These webmasters often face a wall of indifference and lack of cooperation. Apparently, getting departments to see the benefits of a website and having them cooperate is not easy. This is usually not because departments like to torment webmasters for the sake of it, but because they rather focus on the tasks they have always been doing. They simply do not see why a website would be important enough to warrant taking time out of "regular" tasks and redirect that towards the website. However, the success of a government website depends as much, if not more, on the input of the departments as on that of the webmaster. The departments are the ones that provide the content. Without departmental cooperation there is no content. Without content there is no quality online government information. This is exactly why a lot of webmasters struggle to get departments involved. The problem of difficult cooperation between departments and webmaster seems to rear its head more often in organizations where the website started off as a one-man affair or was heavily promoted by one web-aware person or group. A probable reason for this is the fact that departments have not been involved in the development and "evolution" of web operations. When they finally do get involved it requires a sudden change in routine and culture. In essence, the departments are suddenly confronted with large changes in their environment to which they will have to adapt. However, the changes are of such a scale that the do not fit existing structures

and procedures. In such a situation double-loop learning kicks in. As was argued earlier on, double-loop learning can be a bumpy ride. For example, one official from Washington, D.C.'s government remarked that some of the departments did not think of the government website to publish press releases. Instead they still call the traditional media, and forget about the possibilities the website offers. Others are reluctant to merge web maintenance into their existing routine. Of course, workload and resources have something to do with this, but rigid organizational culture is likely to be just as big an influence.

Much literature about bureaucracy has commented on this rigidity of bureaucratic organizations. An article by Merton about dysfunctional bureaucracy is one of the more famous (Merton, 1940, p. 560-68). In his article Merton presents arguments about how bureaucracy can become counterproductive. The reason for this is the fact that bureaucracy facilitates ineffective and inefficient behavior by employees and management. According to Merton, bureaucracy leads to a shift in goals. Employees are so disconnected from the organization's main goals that they identify different goals that are more relevant to them. Personal and departmental interests are thus often a higher priority. The tendency to increase the department's influence in the organization by expanding tasks and budget is a prime example of this. Rigidity and tendency against change can be explained by this non-convergence of goals. In the case of website maintenance departments often do not see why a website should be high on their priority list. For all intents and purposes surely it is not in their interest? Webmasters thus often face the difficult task of convincing departments that and why they should contribute by offering information online.

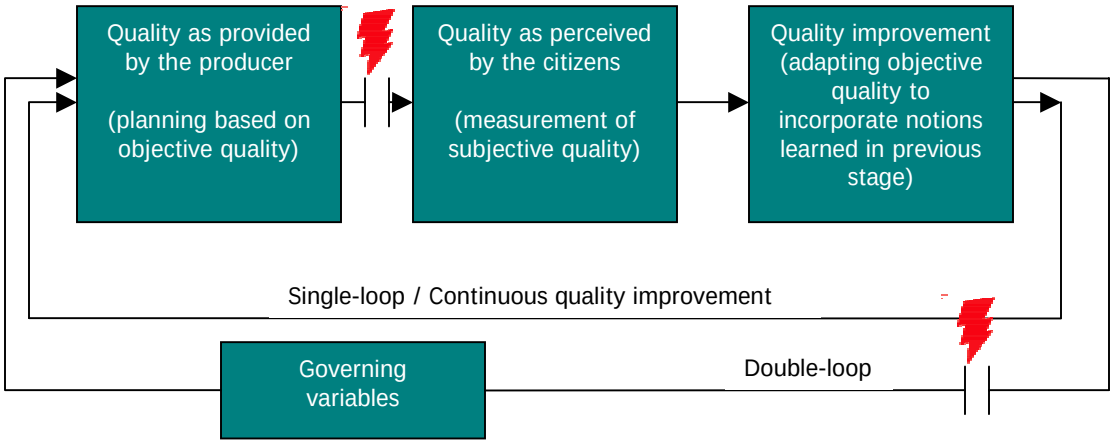
Despite the lack of cooperation quite a few webmasters nonetheless managed to add a decent amount of information to the website. However, as sites grow larger they become increasingly difficult to maintain, which is when the lack of organization-wide support really starts to become noticeable. Especially in regard to information quality criteria such as accuracy, currency and accessibility full support from all departments is needed to ensure a certain level of quality of the e-government operations. Accuracy benefits greatly if the information and services are maintained by the relevant departments and the people who are experts at the subject. Currency is a time-consuming, but all important aspect of e-government. Webmasters alone are not able to maintain currency, especially on large sites. Again it would be helpful if maintenance is delegated to several people, preferably by letting departments maintain their own information and services. Accessibility is ensured by sound coordination between departments. This allows for a standardized look and feel to information and services. Standardization means that people will only have to get to know their way around one single way of browsing or using services in order to be able to easily navigate and use all online information and services that a local government offers.

The following model visualizes what consequences lack of awareness has in regard to the quality improvement loop (figure 5). A lack of awareness, which according to several webmasters results in lack of cooperation means that the quality as provided by local governments is often of a sub optimal level. Because departments are not interested in website maintenance information and services are often lacking or outdated. This also means that a website most likely falls short of fulfilling its potential as an interface

between government and services. Citizen feedback may be used sporadically or not at all. The consequence of this is that government misses out on a possibility to improve quality in regard to e-government and ultimately their policies as a whole. In short, the quality improvement loop does not function properly because of problems in the first stage.

The fact that webmasters mentioned that departments seem to give priority to their traditional tasks points at rigid bureaucratic structures such as discussed in 2.3.3. Rigid bureaucratic structures inhibit organizational learning (Crozier, 1973). The remarks from webmasters about lack of awareness also hint that this is the case, or that learning at least is often a slow process of muddling through. This has been visualized by a disconnected double-loop.

Figure 5, conceptual model and problems in regard to lack of awareness.



5.1.2 Resources and e-government

The examples above all have one thing in common; they rely on integration of the new technology through changes in structures and procedures. However, through interviews it was learned that these structures and procedures often do not exist. The fact that apparently a lot of local governments still have to go through this phase of double-loop learning can also be used to explain some other common difficulties as described by webmasters. One of the biggest problems that webmasters face, especially in small local government, is lack of resources. Some small local governments have an annual website budget of as little as a couple of hundreds of dollars. Small budgets translate into

various other problems. A lot of webmasters complained about lack of time to maintain the website properly. In small governments the webmaster often was originally hired for a different task, but now spends part of his or her time maintaining the website. A lot of the webmasters for whom this is true commented on the fact that this means they are simply not able to get around to certain things they should and want to do. Currency is often the first to go out the window, because webmasters have no time to periodically check whether pages are still current. Something that adds to this problem is the fact that most of the webmasters are very driven and enthusiast about getting information out there. Almost every webmaster that has been interviewed said he or she wanted to have as much government information available online as possible. Although this is a noble and understandable goal, as was mentioned earlier it also has some major implications in regard to the effort it takes to maintain it all.

Another problem that is directly linked to small budgets is a lack of training. Most of the interviewed webmasters that rely on small budgets are self-taught HTML coders or used so-called "what you see is what you get" software. "WYSIWYG" software presents a graphical way of building web pages by simply adding and modifying objects and text. This software is user-friendlier than hard-coding HTML, but is very clunky as well. It produces much unnecessary code and often awkward looking web pages. Money to buy better software is usually not available. Because these webmasters do not receive any or very little training, they learn as they go. This not only has an effect on the appearance of websites, but also on its accessibility and other important aspects. It becomes an even bigger problem when a website was developed by a web-savvy employee who then leaves the organization. With this employee almost all knowledge about web operations is gone and somebody else will have to try to take over. This was the case in the City of Greenbelt, MD. For organizations that rely on the expertise of a single employee in regard to their website, knowledge management is a big concern. Knowledge management can prevent the loss of expertise when an employee leaves the organization (Steijn, 2001). By implementing the tools knowledge management provides, government can prevent situations where website maintenance will become the responsibility of somebody without sufficient expertise. This is because the tools are used to have employees share their knowledge throughout the organization. The knowledge then becomes part of the organization instead of just one individual.

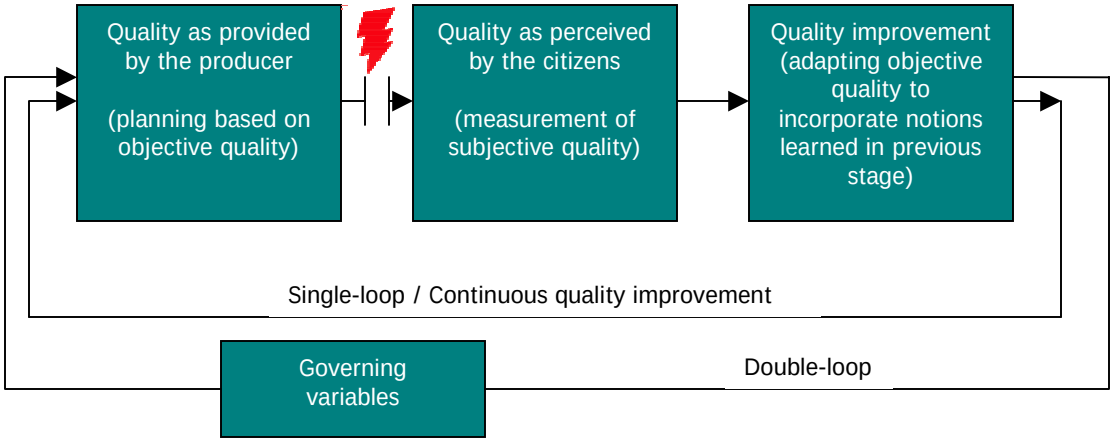
Of course, complaining about budget is also part of the bureaucratic interdepartmental game. According to organizational literature departments always try to broaden the range of their tasks and increase their annual budget (Drummond, 2000, p.153). Even in larger governments where the ICT departments have large amounts of resources at their disposal, webmasters occasionally mentioned they need more budget to be able to fulfill their ambitions. This organizational behavior is used to make one's own department indispensable and thus protect one's own interests. That is not to say the problem of small budgets is not real. It definitely is, especially in small governments. However, one has to judge for each case whether the problem is really the budget or whether it may be something else.

The budget problem is not easily solved. The fact why small town web operations have so little resources is simply because small towns have little resources. These towns still have to do their "regular" tasks, so web operations are usually not a priority on the

budget. In regard to e-government the problems will have to be tackled through double-loop learning as the problem is not a new one. Through trial and error some equilibrium will have to be found between existing costs and the new costs of the use of new technologies. This might go as far as re-evaluating the importance of e-government versus more traditional ways of providing information and services.

Again we see that the quality improvement loop is frustrated at the first stage, this time by a lack of resources. Like lack of awareness, lack of resources means that the quality as provided by the local government will be suboptimal. Without adequate time, training and budget webmasters are not able to do all that is necessary to make sure the e-government initiatives have a high level of quality. An example that was mentioned in this paragraph is the poor state of currency that often results from this. Unlike a lack of awareness, which has more to do with a state of mind and the organizational culture, lack of resources does not always interfere with double-loop learning. Instead, it is double-loop learning that eventually leads to local governments adjusting their views and priorities and make more resources available for e-government. Particularly after it becomes clear that e-government becomes more and more successful. This was seen in Takoma Park, MD., and the City of Greenbelt, MD., where the council recently decided to make more funds available for e-government. A lack of resources also forces governments to be creative and seek other ways of providing services, for example by enlisting local students such as in the City of Greenbelt. Two examples of how double-loop learning can lead to changes in structures and processes that would otherwise never been used.

Figure 6, conceptual model and problems regarding lack of resources.



5.1.3 Departmental silos and e-government

The following problem has been recognized as common amongst large organizations for quite a while now. The problem has always been a major issue in regard to efficiency, effectiveness and quality, but it also has consequences in regard to network-based technology such as e-government. Successful e-government, as mentioned earlier, depends on department-wide implementation. Departmental silos stand in the way of this. Departmental silos represent a situation where inter-departmental communication is problematic and inter-departmental cooperation is hugely flawed. In the case of e-government this may mean that departments are reluctant to cooperate in a single e-government endeavor. Indeed, some webmasters that were interviewed have to cope with the fact that some departments rather start and maintain a website of their own, complete with distinctive lay-out, content and sometimes a completely different Internet address. Most of the webmasters that have to deal with this have been unsuccessful to persuade those departments to discard their own website in order to have their pages blend in to a single government website.
As may be expected, the situation of departmental silos often goes hand in hand with large departments. Large departments often develop their own, distinctive culture. This is partly because larger departments have more power, partly because individuals are farther removed from the rest of the organization and often because individuals all have a similar background, in education for example. As was just discussed, organizational culture is often very rigid. However, changing the culture of a department that has more or less shielded itself from the rest of the organization is many times more difficult. E-government forces organizations and departments to question their traditional ways of working. Interviews in local governments that have made considerable progress in implementing e-government show that departmental silos have become less pronounced in this regard, whereas departmental silos are still an issue in local governments that are in the early stages of implementation.

Webmasters often play a crucial role in this change of attitude. First through stimulation, as discussed earlier, later as facilitator in which they organize inter-departmental meetings and become more of a tutor and a mentor to whom the departments can go if they need assistance. They may show why and how to cooperate and in some cases even have the power to force departments to work together. This was seen in the local governments of the City of Fairfax, VA., The City of Rockville, MD., and Washington, D.C. This in itself is an example of reevaluating structure and the distribution of responsibility and accountability through double-loop learning. When webmasters get more powers through redistribution of responsibility and accountability they have yet another role to fulfill. This is the role of overseer. In this scenario the webmaster issues guidelines and rules about format, procedures and structures in regard to e-government. The redistribution of this power and responsibilities are not easy however, as is usually the case with double-loop learning.

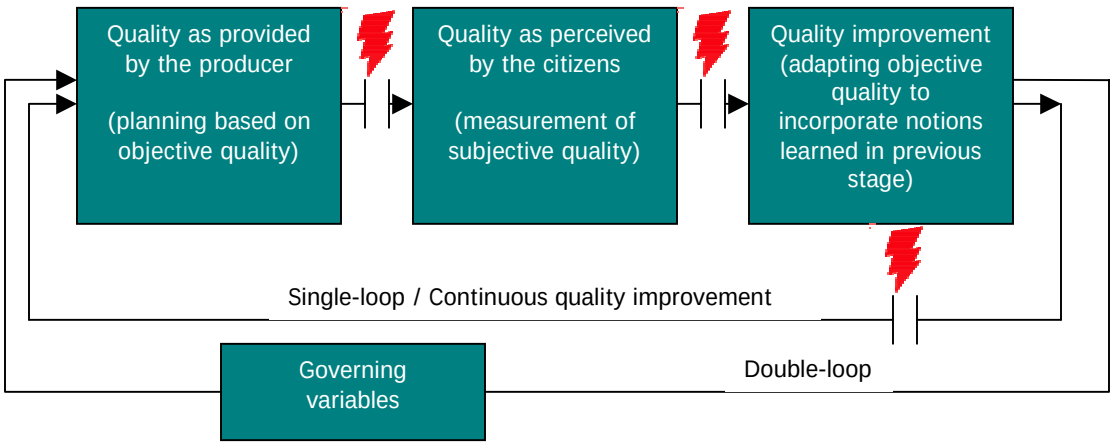
Which of the various roles webmasters have to play all depends on the situation they find themselves in, and the progress made through double-loop learning. In organizations where awareness in regard to information technology is still relatively low, a webmaster will have to assume the role of stimulator more often than in an organization where everybody is actively involved with e-government operations. In the

latter situation a webmaster will more likely assume the role of facilitator or even overseer. Which of these two roles that will be, depends largely on the organizational culture. In an organization where awareness is high and people co-operate well a facilitator will be at the right place. Here a facilitator can guide the teamwork. In larger organizations or organizations were departmental silos exist more strict guidelines are needed. Here an overseer, with an effective range of instruments can get people to work toward a common goal.

As in the previous two paragraphs these problems have been visualized using the conceptual model from chapter 2 (figure 7). This shows that departmental silos may have consequences for each stage of the quality improvement loop in regard to single-loop learning. The quality offered by government may suffer from the fact that departments use different website addresses, looks and systems. This makes things more difficult for citizens as it becomes harder for them to know how to navigate websites, who to contact or where to go for a certain digital service. Departmental e-government may be high quality, but the overall level of quality of a government's e-government initiatives suffers.

Departmental silos may also cause inefficient and ineffective measurement of citizen evaluation. When departmental silos exist each department is likely to measure citizen evaluation on its own, without communicating to other departments what is learned from that feedback. This in turn has consequences for the third stage of the quality improvement loop where notions from this feedback are used to improve the quality of e-government. Departmental silos prevent successful coordination and cooperation between departments. Knowledge will not be spread amongst the entire organization, meaning that a large part of the organization misses out on a lot of potential for improvement and learning.

Figure 7, conceptual model and problems in regard to departmental silos.



5.1.4 Organizational structure and e-government

As was said, the new technology also has an impact on existing organizational structures. These have to be adapted to cope with the new situation. E-government for example requires organization-wide delegation of tasks and responsibilities. Important when delegating responsibilities is accountability. The departments, or somebody within each department, should be accountable for the quality of their pages. This accountability was often lacking in local governments visited during this research. This meant that there was no incentive for departments to keep their pages up to date and to maintain a high standard of quality. Because a lot of local governments are still in the early stages of e-government implementation, webmasters often lack the power to get departments to improve the quality of their e-government endeavors. In practice this often means that a webmaster has to maintain everything in regard to e-government, or has to works hard to keep departments stimulated to provide content. Departments often do not see e-government as a priority and they can easily ignore it because there are often no consequences if they do so. This was seen in the City of Takoma Park, MD.m where the webmaster made many remarks about the difficulty of getting departments to provide content.

In order to get people to cooperate it is necessary that people know what is expected from them and that sanctions are possible if they fail to deliver. The possibility of sanctioning somebody that does not deliver in regard to website maintenance is often almost completely absent or simply not enforced. Obviously this is a strange situation that leaves the webmaster in a very difficult position. As was mentioned before, e-government almost completely depends on information from the departments. As it is, most webmasters have to rely on the good will of the departments. If the departments fail to cooperate the webmasters have no means of making sure the information and services get out there. Not surprisingly, traditional structures and procedures are still in place when local governments make their first strides on the Internet. Most of the local governments first have to go through the phase of double-loop learning to get the correct structures in place. As it is, almost all local governments that were visited are still in the midst of defining the place e-government should take in organizational structure and procedures. As such, webmasters have to struggle against aging structures, until the organization has adapted.

The problems associated with lack of accountability have consequences for the quality of e-government as provided by local government (figure 8). In many local governments departments are still free in whether they cooperate in website maintenance. When they do cooperate there is usually no way to ensure that departments' contribution is up to a certain standard of quality. Again the example of the city of Takoma Park, MD., is useful here. When the webmaster did receive content from other departments, she usually found it necessary to make changes in order to assure the published content would be of a decent level of quality.

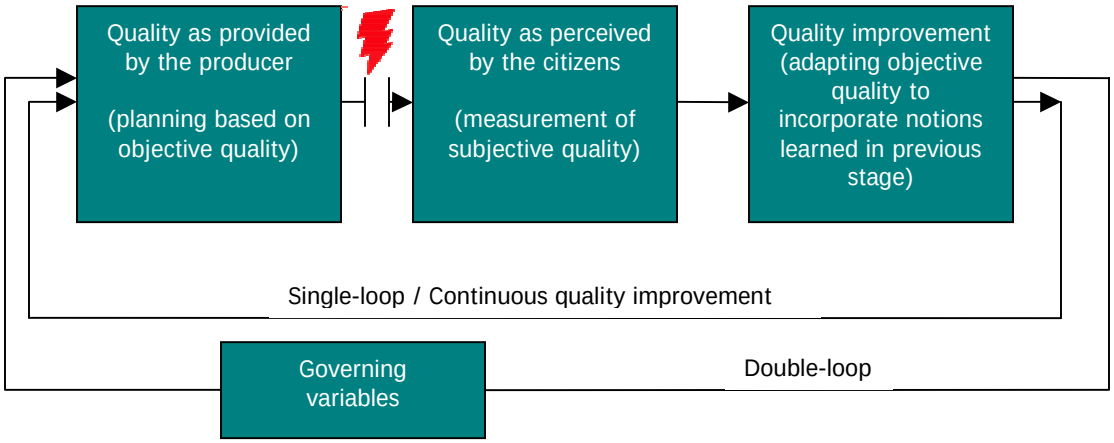
The lack of accountability that was often encountered shows an indifferent approach towards e-government among many local governments. The website is often regarded as a bonus, something which is nice but not really an integral part of government organization. As such, the organizational model in regard to accountability is not fit to

effectively maintain quality e-government endeavors. Local governments that stood out in terms of quality seemed to have made better progress in re-arranging structures, procedures and institutions then those that were still struggling. The local governments that stood out somehow managed to learn and adapt. Interestingly, the amount of progress was not connected to the amount of time e-government endeavors have been underway. Some local governments seem to be better able to deal with change then others. The e-government initiative of Washington, D.C. is still relatively young compared to those of other governments for example, but interestingly most of those other governments have not advanced nearly as much as Washington, D.C. This probably has to do with the fact that Washington, D.C.'s mayor places much importance on making government accessible and responsive and thus has allocated quite some resources for e-government.

Changes in organizational structure and culture require a commitment from both government and staff. For example, some local governments that were visited seemed to really push for quality online information and services. Although this did not always mean that their sites were of an extremely high quality, there were signs that big improvements had been made over a relatively short time span. According to Brill and Worth organizations that want to initiate change should "*develop a vision, a mission and a set of ideals*" (Brill et al, 1997, p. 119). A clear vision will help to focus the energy of individuals, groups and the entire organization towards a set of goals. The scope of a vision depends on one's position in the organization. Although a webmaster is perhaps able to set a vision for the ICT department, it takes somebody from the upper regions of the organizational hierarchy to set a vision for the entire organization. This is what happened in various local governments that were visited. As mentioned, in Washington, D.C. the vision was set by the mayor himself who wants to make D.C.'s government as accessible as possible for its residents. A high quality website is an important aspect of this initiative. A couple of other local governments had developed strategic plans in order to communicate the vision to employees and residents. The city of Rockville has done this by formulating various goals and principles on which the plan to improve citizen access to government information and services is based. (City of Rockville, 2001) Of course the goals set by the vision should be credible. If the goals are too outrageous employees will likely take a look at the vision, have a good laugh and continue doing their daily tasks. However, a doable, emotionally powerful vision may help to identify priorities, goals and galvanize employees. It can also be used to communicate the importance of a high quality website and its use for local government.

It can be argued that organizations that show commitment and set out goals to achieve are likely to foster learning and are thus better able to adapt to the new technology. Results gathered in the Washington D.C. area show that local governments that are truly committed, set goals for themselves and have the support from management and council generally seem to produce the best practices of e-government.

Figure 8, conceptual model and problems regarding lack of accountability.



5.1.5 Different contexts, different problems

The problems that are mentioned here were all mentioned by webmasters that were interviewed. However, that does not mean that these problems are an issue in all local governments, all the time and all at the same time. Usually it depends on the situation which of these problems webmasters face and how big these problems are.

During the interviews it became apparent for example that a lack of resources is mostly a problem that rears its head in small local government. These governments often have a small budget as it is which leaves little for web operations after budget is allocated to the usual tasks. These governments often have only a handful of employees, which limits the time that can be spend on website maintenance. These problems are often not as big a deal for larger government organizations. Counties and the Washington, D.C. government all have budgets that are much, much bigger. Washington's budget even is about one million dollars, which seems unlimited compared to the less-than-thousand dollar budgets of some small governments. The explanation is simple. Larger governments have more revenue because they can tax more constituents. The implications however are far reaching.

This is not to say that life is easier on webmasters in larger local governments. Large government becomes susceptible to other problems. Large governments have to deal with the difficulties that go with managing a large organization. Merton's bureaucratic dysfunctions are more likely to become more pronounced the larger an organization gets. The problem of departmental silos is something that is unlikely to exist within small local governments. However, in larger organizations people start identifying themselves with other things than the entire organization. Departments become more important.

Both lack of awareness and lack of accountability do not seem to depend on the size of government organizations. During the interviews they were mentioned by webmasters from both small and larger local governments. More important then size is whether e-government has been institutionalized or not. They tend to be a problem in governments where web operations are just starting off, or have always been largely out of sight of the rest of the organization. As such, double-loop learning has not yet taken place, so the organization hasn't been able to learn and adapt. This is a difficult point in double-loop learning. At one hand e-government may be easier deployed organization-wide through hands-on learning. However, learning is needed in order to be able to get people to accept the organization-wide changes and deployment. This paradox has also been mentioned in organizational learning literature. Unfortunately literature does not provide a clear insight in how to cope with this paradox or other conflicts involved with double-loop learning. In practice the phase of double-loop learning seems to consist mainly of experimentation, until the changes are institutionalized in some form or another.

Change agents, as opposed to resisters, can help greatly to smooth this process of muddling through. Change agents are employees that act like catalysts to the change process. Through social interaction and the right choices at the right time they have the ability to guide the process, even if they are not as closely involved as some others may be. Their biggest asset is that they help others to open up to the reasons for and possibilities of change. Sull points to the fact that change agents not always necessarily have to be outsiders (Sull, 1999). Employees sometimes fear that outsiders do not understand the organization and its culture. This in itself can be reason enough to spark resistance amongst the employees. Sull therefore proposes to first try and identify possible change agents within the organization. These people have the right attitude to foster change, but at the same time know the organizational culture well. This is very welcome because change processes are usually a balancing act between often significant changes and respect for organizational culture. Prime examples of change agents are the mayor and Chief Technology Officer of the Washington, D.C. government who have managed to get the organization to adapt in a relatively short period.

5.2 the quality improvement loop

Above paragraph discusses that a lot of the visited local governments are still struggling to institutionalize e-government. Necessary structures and procedures are not yet in place. These organizations still find themselves in the middle of the double-loop learning phase where the have to redefine what was previously common.

However, a few local governments apparently already had managed to finish that phase successfully at the time of the interviews. These local governments have structures that are in various degree adapted to e-government. In these organizations single-loop learning has taken over from double-loop learning. Without being confronted by conflicts and difficulties like a lot of other local governments, these organizations are able to focus on the quality of the actual information, services and communication. Because the phase of double-loop learning has allowed them to experiment with what works best in their environment, the structures and procedures that form the basis of single-loop

learning are somewhat different in those local governments. The city of Fairfax, VA., for example managed to get structures in place that seem to work for them in regard to e-government. This is not to say that these structures are very formal and regulated. Compared to Washington, D.C.'s structures the city of Fairfax uses coordination on a personal, informal level which apparently works in the context of a small local government.

These differences mean that the first stage of the quality improvement loop in single-loop learning is handled a different way by different local governments. The main differences usually have to do with the degree in which guidelines and rules are implemented and enforced. In some organizations rules and guidelines are implemented and enforced in an informal way, such as in the city of Fairfax. Usually the webmaster in those organizations is able to work closely together with the departments on a personal level, often due to the smaller size of the organization. In larger organizations, such as Washington, D.C. and Fairfax County, personal contact is often lacking so logically structures have evolved to incorporate stricter guidelines and rules. The amount of strictness depends on the culture of the organization. For example, Washington D.C. employs strict guidelines and rules that departments have to adhere to closely. In order to enforce such strict rules the Office of the Chief Technology Officer has quite a lot of power to hold the departments accountable. A specially implemented quality control system couples with sole publishing right of OCTO makes sure that every department has to live up to the guidelines in order to get their pages published. No matter in which form, fact is that local governments that seem to have the best results all have structures in place to deal with the new role of technology and have integrated it into the entire organization.

Another thing which seems to be common amongst these governments is (basic) implementation of the second stage in the quality improvement loop. Most of these local governments mentioned ways of using citizen feedback to improve their e-government efforts. Fairfax County went further in this then any of the other local governments that were visited. Fairfax County on several occasions used surveys and user groups to find out about citizens thoughts and preferences in regard to e-government. This was then used to improve the quality of their website, especially during the latest redesign. However, on average (online) communication between citizens and government is still very basic. Few local governments remarked on existing procedures revolving this communication. The local governments that are still struggling with the necessary changes in structures do not seem to have these basic procedures in regard to communication.

This fairly limited amount of communication between government and citizens has implications for the third stage of the quality improvement loop. The third stage revolves around quality improvement based on citizen feedback. It would be unfair to say that local governments do not show signs at all of working to improve the quality of their e-government endeavors. On the contrary, there seems to be great enthusiasm, at least amongst webmasters, to try and constantly improve their work. However, this is often done through learning from trainings or discussing experiences and practices with colleagues and fellow webmasters from other government organizations. This certainly seems to be effective and is a tool which should not be ignored in the future. However,

communication between government and citizens offers a lot of potential. As discussed it can help to improve the quality of e-government according to citizen wishes, but it may also close the gap between government and citizens and thus increase democratic legitimacy. Something for which e-government is a promising tool, but which is often overlooked. This means that governments are not able to improve quality using subjective quality and will have to keep relying on planning according to sub-optimal objective quality.

5.3 Conclusions

The last two paragraphs discussed the results from interviews with local government webmasters and linked them to the model from paragraph 2.4. This in turn offered valuable clues which can be used to explain the results from the scan of websites in the Washington, D.C. area.

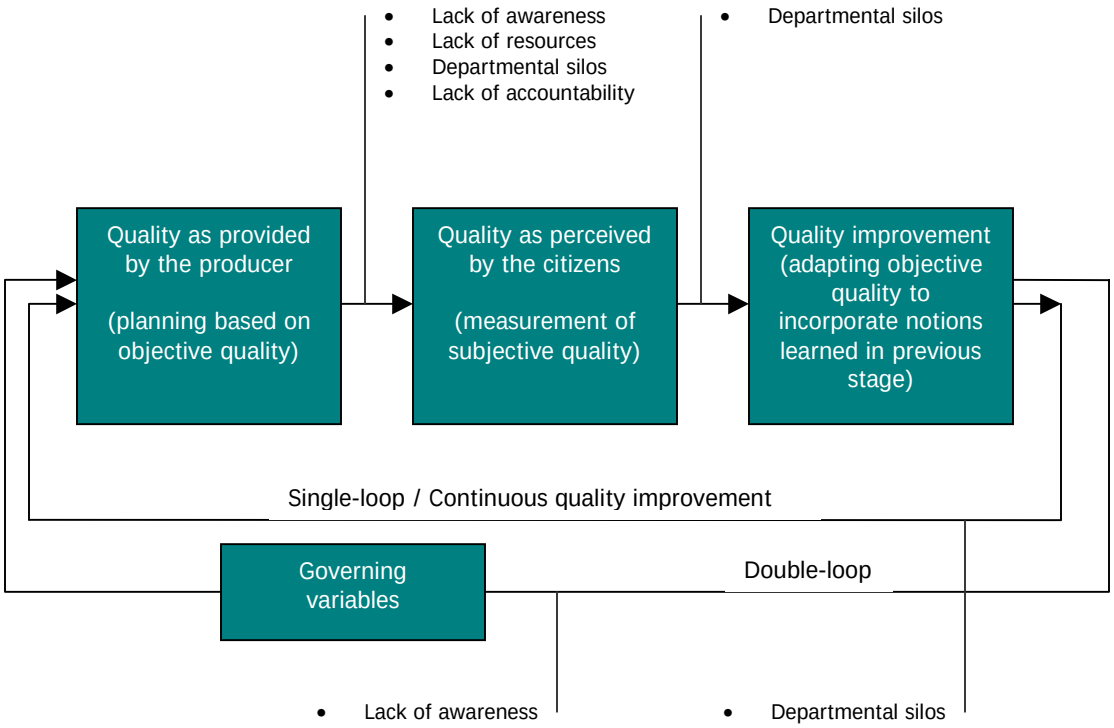
The most striking thing is that a lot of local governments do not seem to be far enough with the implementation of their e-government endeavors to really start focusing on quality improvement based on measuring subjective quality. Most organizations still seem to be struggling to integrate the new technology into the organizations. Understandably the kind of changes required for this take time, which for now means that a lot of webmasters have to work in an environment where they do not always receive full cooperation from the rest of the organization. Without this cooperation e-government cannot reach its full potential. Logically this has consequences for the current quality of e-government. Examples of these consequences are mentioned in chapter 4. The problems that were noticed in regard to lack of best practices, currency, accessibility etceteras will never be fully solved as long as organizations still find themselves in the stage of double-loop learning. One should not let him or herself be confused by this into thinking that double-loop learning is something negative because it takes a lot of time. On the contrary, double-loop learning is a necessary step if organizations want to be able to implement the necessary changes.

The problems that have been discussed in this chapter have been put into the conceptual model (figure 9) showing which stage of the quality loop gets frustrated by which problems. Most identified problems have a direct impact on the first stage of the quality improvement loop, but this does not mean other stages are unaffected. Suboptimal quality in the first stage obviously has consequences for the level of quality in the second and third stages. For example, if a website is inaccessible, citizens will not be able to give feedback as easily as they could have if the quality in the first stage would have been up to scratch. This in turn inhibits an organizations potential for single-loop learning. Departmental silos are mentioned separately for each stage as the problems do not necessarily materialize in one stage only. Interviews showed that separate departments may turn out quality e-government regardless of the existence of departmental silos, but that those silos inhibit the communication of citizen feedback, or what was learned from that feedback. So unlike any of the other problems that were mentioned departmental silos may have a direct effect on all stages of the quality improvement loop, whereas other problems mainly materialize in the first stage and thus have an indirect effect on the other stages.

Webmasters seem to become more aware of the necessity for learning so they can focus on what should be the first step towards successful implementation of e-government. Many webmasters commented on trying to find a way to facilitate cooperation between departments. Only when these necessary changes have been made to structures and procedures will it be possible to focus on improve quality through single-loop learning in the form of a quality improvement loop. That this is something which can be achieved is shown by a select group of local governments that have already gotten that far. The results of the e-government initiatives of those local governments are testimony to that.

One interesting question in regard to double-loop learning remains. Lack of awareness seems to frustrate double-loop learning. When there is a lack of awareness organizations see no need to change structures to facilitate e-government. At the other end one must realize that through double-loop learning organizations may become more aware of the need to do just that. It's the ancient story of the chicken and the egg, for which there is no clear-cut answer. However, most local governments seem to overcome this stage of lack of awareness somehow. This may be through some unforeseen changes such as hiring somebody powerful who knows how to push e-government, which was the case in Washington, D.C., or through muddling through until e-government picks up momentum, as was seen in Takoma Park, MD and Virginia County, VA. It can therefore be argued that lack of awareness does not completely inhibit double-loop learning, but rather seems to slow it down.

Figure 9, conceptual model and problems mentioned during interviews.



6

This final chapter will provide the conclusion of this thesis based on the notions discussed in this thesis and what was learned through the gathering of empirical data. This chapter will answer the main and sub-questions as described in paragraph 1.3. Recommendations will be formulated, based on the integration of notions about the organization of the digital interface between government and citizens, the difference between objective and subjective quality and organizational responsiveness

6.1 Answers to questions

How can quality in regard to communication, information and services through local government websites be improved?

This main research question is what this project was based upon. By answering this question research goals could be met. In order to be able to do this, sub questions were formulated. The answers to these questions will be discussed here. All questions will be repeated, followed by the findings as discussed in this thesis.

1. ***How can we define quality in regard communication, information and services through local government websites?***

In chapter 3 a definition of quality was found through the study of information quality literature. Unlike what was expected upfront, literature did not provide a clear cut definition of quality. It even questioned the possibility of doing so. Instead it discussed quality according to several information quality criteria. A definition of information quality was found by using the most common criteria in literature. Chapter 3 concluded by stating the following definition of information quality;

Information quality is the combined result of the accuracy, completeness, relevance, currency and accessibility of information. Information with a high level of quality is therefore accurate, complete, relevant, current and accessible. These criteria should be considered in a broad sense, which makes them applicable to many situations.

This definition can be used as a way to describe objective quality. As argued in this thesis, a definition of objective quality is needed by organizations to plan for quality e-government. However, should also actively try and measure subjective quality by processing citizen feedback and linking their thoughts about accuracy, completeness, relevancy, currency and accessibility to the definition of objective quality as used for planning. Ultimately organizations should use a definition of information quality that is completely based on citizen feedback an thus citizens' needs.

2. ***How can we conceptualize and measure quality in this context?***

It must be admitted that there is certain vagueness to this definition, which is not uncommon amongst definitions found in information quality literature. This is to be expected when dealing with a vague and subjective notion such as information quality. However, it is a workable definition in that it has the potential to offer guidance to

people in many different contexts looking to improve the quality of their digital information, services and communication. It is also workable as it offers a clear conceptualization of quality and can be used as a tool to measure quality. By scanning information using the identified information quality criteria, an assessment of the overall information quality can be made. It has to be clear that these criteria cannot be measured objectively. As such the scan used in this thesis should not be considered as a generalization of the state of quality. In order to do that a survey with questions based on these criteria should be taken amongst citizens. Objective quality is merely a suboptimal way for organizations to plan for quality. Only citizens are able to tell what should be considered as true information quality, otherwise known as subjective quality.

3. ***What is the state of quality in regard to communication, information and services through local government websites in the Washington, D.C. at the time of this research?***

The identified criteria were used during a scan of local government websites in the Washington, D.C. area. The results show both promising aspects, as well as some (serious) problems. These will be discussed in-depth through the answers to the next two questions.

4. **What problems with quality in regard to communication, information and services through local government websites in the Washington, D.C. area could be identified at the time of the project?**

As could have been expected many of the theoretical best practices, such as references and consistent use of revision dates, were lacking. Although theoretical best practices do offer potential it remains to be seen whether they will ever be used in practice. When scanning for completeness and relevancy lots of varied results were found. Presumably this is because these are the most subjective criteria of all and are therefore very much linked to context and personal preferences. These findings alone show the need for measuring subjective quality. The biggest problems could be noticed in regard to currency and accessibility. A lot of websites contained pages that were not up to date, or featured an inconsistent lay-out and look compared to other pages. The most interesting thing learned from the results of the scan is that the biggest problems seem to be those that rely on organization-wide cooperation and coordination. Apparently these problems in the quality of information are rooted in more fundamental, organizational problems.

These problems were identified through various interviews with several local government webmasters. The problems that could be identified were lack of awareness, lack of resources, departmental silos and lack of accountability.

5. **What are the causes of the problems that have been identified?**

Many local governments are still in the first stages of truly implementing e-government. This means that e-government often takes place along the outer edges of the organizations. It has not been institutionalized yet and as such structures and procedures are often not optimal for facilitating the kind of cooperation and coordination

that is needed for successful implementation of e-government. Unfortunately traditional structures and procedures often prove to be rigid and organizational defense mechanisms inhibit the necessary changes. Lack of awareness and departmental silos are particularly troublesome in this regard.

6. How can quality in regard to communication, information and services through local government websites be improved?

Before local governments can improve the quality of their e-government initiatives through the use of a quality improvement loop, a lot of local governments need to (continue to) adapt structures and procedures to facilitate the new technology. The fundamental problems with rigid organizational structures and procedures need to be solved first. Notions from the schools of organizational learning and total quality management provided useful ideas about this process. The major contribution from organizational learning to this thesis is the distinction between single and double-loop learning. The idea behind double-loop learning is that organizations may sometimes need to allow for experimentation, trial and error in order to let people try out new approaches, structures and procedures. This allows organizations to learn and adapt more easily to major changes in environment. Many local governments were found to be struggling with conflict and unsuitable structures. For example, in many of the smaller towns and cities that have been visited for interviews website maintenance is often a part-time job that some member of the organization has to do on the side. Other departments often do not see the need to consider providing digital content and services a priority. The process towards awareness often takes quite a lot of time. Many webmasters mentioned that they use the steady increase in user numbers as a way to convince government to allocate more resources for e-government. Often this is not without results. However, because of rigid structures and procedures there is not always a lot of room to learn. As was shown in chapter 5, lack of awareness can be slowly taken away through double-loop learning, but paradoxically, lack of awareness at the same time slows the learning process down. Organizations should therefore try to avoid these difficulties in learning by striving towards an organizational culture that is open to new ideas and learning.

Some local governments did already manage to implement changes and have the required structures and procedures in place. Washington, D.C.'s government was a particularly good example of this. This local government formulated a mission statement that focused on the need of e-government to enhance government's accessibility and responsiveness. As such the Office of the Chief Technology Officer had many powers to hold departments accountable in regard to quality and cooperation. Departments in this organization often have at least one person that is responsible for those department's e-government contributions. Instead of double-loop learning, single-loop learning has become the main mode of e-government quality improvement in those organizations. Single-loop learning in regard to quality revolves around a quality improvement loop. This quality improvement loop is taken from notions from total quality management, which is why total quality management was integrated into the model of double and single-loop learning in paragraph 2.4. Using this model it was possible make arguments as to why certain problems were found during the scan of local government websites in the Washington, D.C. area. It seems that those governments that have managed to

make the necessary changes to structures and procedures do not have to deal with major difficulties in the first stage of the quality improvement loop. These necessary changes to structures incorporate delegation of responsibility to the departments, an internal quality control system and accountability of the departments in case they provide suboptimal quality or prove to be lacking in cooperation. These are merely examples and do not encompass every change that may be necessary to adapt structures for e-government. Double-loop learning has to provide the necessary changes and appropriate structures, based on context and needs.

Although some local governments have managed to offer a decent level of information quality, there may still be a lot of potential for improvement if there would be more attention for the other two stages in the quality improvement loop. These two stages comprise of measuring citizens' perception of the quality of e-government and improving the quality according to these measurements. As it is now, local government does offer the possibility of citizen feedback, albeit in basic form. In some cases procedures exist to use this feedback to improve information quality. However, it does so only marginally and thus fails to reap the full benefits of what e-government has to offer. As argued in this thesis, e-government has the potential to enhance governments' responsiveness. Being a network-based technology it can be used relatively easy by government to measure citizen feedback and then use this to improve the quality of both government services and policy. The scan of websites and webmaster interviews showed that these possibilities are not used to their full potential just yet, even by those local governments that seem to have adapted to e-government more than others. Usually the option for feedback is limited to providing contact information or feedback forms. Although these are definitely steps in the right direction, they are limited compared to the true possibilities offered by e-government such as actively seeking citizen participation through, for example, online discussions, polls or chat sessions. Until local governments start using e-government more to enhance their responsiveness they miss out on a valuable tool in regard to quality improvement, but also for narrowing the gap between citizens and government and thus increasing democratic legitimacy.

All things considering, e-government thus offers the potential for government to incorporate notions from subjective quality instead of simply focusing on sub-optimal, objective quality. In other words, government may become more responsive through better citizens-government communication. This in turn allows for a shift from single-loop learning to more double-loop learning. Single-loop learning will always play a major role in institutionalized procedures. However, an organization capable of double-loop learning is better suited to cope with the changing demands from citizens. In this regard e-government is a double-edged sword. At one end it is a channel for providing services and information that obviously has to have a minimal level of quality. This may be maintained through a continuous quality improvement loop, which is in fact single-loop learning. At the other end e-government is a channel for citizen feedback and participation. This allows government to improve their policies and to better match the needs of citizens by measuring subjective quality. In this regard e-government enhances governments' capabilities for double-loop learning and responsiveness.

7. What recommendations can be given to aid the development and use of a digital interface between government and citizens in general?

From these conclusions follows the recommendation to local governments not to try and make e-government work without necessary changes to existing structures and procedures. E-government needs organizational-wide support, which in turn needs structures and procedures that facilitate this. Double-loop learning may be used to adapt to the extensive changes that accompany e-government. As such, organizations should strive to allow members to experiment with structures and procedures involving e-government until they are fit to facilitate successful implementation of e-government. Exactly how this is done was beyond the scope of this research, as it is possible to write lots of thesiss on organizational change itself. Simulations could be useful (Jolly, 2003), but learning from other local governments' experiences seems to be more common.

Cooperation between local governments such as the Maryland municipal League[6], Public Technology Inc.[7] and the Virginia Local Government Web Alliance[8] are good examples of this. Webmasters mentioned that these forms of cooperation were very useful and productive.

More concretely, local governments should strive to delegate responsibility for maintaining e-government content and quality to departments. This makes sure that content and quality is monitored by those who implement policies and are most knowledgeable about the relevant issues. In order to facilitate this, accountability in regard to e-government maintenance should be introduced and enforced. Another change that is necessary for successful implementation is a more horizontal approach to organizing instead of maintaining the traditional hierarchies that are prone to the development of departmental silos. An inter-departmental team that meets periodically can go a long way to break through these vertical structures. Information technology itself can be put to use for sharing knowledge from citizen feedback.

Another recommendation that can be given was also mentioned at the previous page. Local governments will be able to improve e-government quality more effectively if more use is made of the full potential for government-citizen relations offered by information technology. They should try and make more use of the possibilities for communication between government and citizens and not just focus on providing information and services. The potential for a more responsive government through citizen participation is greater in regard to democratic legitimacy than could ever be achieved by focusing on the government role of producer as is now often the case.

[6] http://www.mdmunicipal.org/
[7] http://www.pti.org
[8] http://www.vlgwa.org

The main recommendations from this thesis will be recapped here;

1. Total quality management provides useful tools for improving the quality of e-government initiatives. However, it has to be noted that TQM only allows for single-loop learning, and is thus very limited in regard to enhancing government responsiveness.

2. Organizations should strive to foster experimentation and double-loop learning as this allows them to better adapt when citizens needs and demands change.

3. Webmasters may serve an important role as change agent. As stimulator and facilitator they may be able to help an organization adapt to the new situation. They may have an active role in creating organization-wide awareness.

4. Government should try and actively measure subjective quality in order to enhance the quality of their services, information and policies. Objective notions of quality fall short as they simply cannot grasp the subjective needs and demands of citizens. Objective quality is just a sub-optimal tool that may be used for planning, but constantly needs updating to incorporate the changing needs and demands from citizens.

5. E-government offers the potential to act as a channel for not only service delivery, but for citizens-government communication as well. As such it may be used to enhance government services' quality according to subjective quality as measured through this feedback, but also to enhance government responsiveness and improve policies on a whole.

The goal of this project was to contribute to the improvement of the digital interface between government and citizens. This way, it may contribute to the development and improvement of government-citizen relations. By using various methods of data gathering and scientific literature, recommendations could be formulated that show governments to try and go beyond providing information and services and to create a true interface between government and citizens. The only ones that know what citizens really want from (electronic) government are citizens themselves. A digital interface thus offers the potential for government to ask citizens directly. Of course this is possible for a wide range of topics and both citizens and government can use a digital interface to actively seek and share information. For citizens this has the advantage of better services and information. For government it presents an opportunity to improve its responsiveness and democratic legitimacy. This project has formulated several common information quality criteria which may be used to improve the quality of the digital interface. It also shows valuable insights from both total quality management and organizational learning by presenting a model for continuous quality improvement through learning.

6.2 Reflecting on notions from this thesis

Apart from the answers to the research questions, two more important conclusions were made during the course of this research. The first is the notion that total quality management can be integrated with organizational learning because of the similarities between TQM and single-loop learning. The advantage of this is that decades of scientific literature becomes applicable to aspects of organizational learning, which is fairly new and a lot less is written about. It also allows making the admittedly very abstract notions from organizational learning more tangible. In this thesis this was done describing single-loop learning as three stage taken from TQM; quality as provided by government (planning based on objective quality), quality as perceived by citizens (measuring subjective quality) and quality improvement (adapting objective quality to incorporate notions from subjective quality.

The second important conclusion revolves around the distinction between single and double-loop learning in regard to quality management. It can be argued that as organizations reach the stage where they more and more start to focus on quality improvement, their ability for double-loop learning diminishes. Quality improvement and single-loop learning focus on specific details and aspects of e-government and the procedures used to deliver information and services to the public. When there is so much attention for detail procedures get very strict. This makes them more rigid and so diminishes the ability to question governing variables. Interestingly, that which allows organizations to learn and implement a quality improvement loop will make learning harder as it more and more becomes the focus of quality management. This means that single-loop learning has the potential for creating rigid bureaucracy, something which was argued in this thesis needs to be avoided when striving for a responsive government through quality e-government. Governments should therefore try not to turn single-loop learning (quality improvement) into the holy grail of delivering quality e-government. Although quality improvement is important, it is just as important to maintain learning capabilities to ensure responsiveness and innovation as this may be needed when citizens' needs change. Jolly mentioned that the use of guidelines and regulations in e-government can lead to a fixation on those rules and guidelines, as it often does in bureaucracy. The author therefore also recommends organizations to find equilibrium between a structured approach to e-government and the necessary freedom needed for (double-loop) learning (Jolly, 2003). E-government can help organizations break from rigid bureaucracy, but they should be aware of the fact that e-government also has the potential to take that ability away after it has been institutionalized.

In regard to these difficulties the difference between objective quality and subjective quality may be used as a way to find that equilibrium. Rules and guidelines are based on objective quality. They are a tool to ensure a certain level of quality, based on certain objective notions about what constitutes quality. In a successful quality improvement loop as conceptualized in this thesis, objective quality is continuously adjusted to incorporate subjective quality. Subjective quality should therefore always be considered more important than objective quality, based on the notion that successful quality management should lead to meeting citizens' expectations and demands (Williams, 1994). With this in mind organizations should be aware of this priority. When objective

quality gets a higher priority than subjective quality it is a sign that more emphasis is being placed on rules and guidelines instead of responsiveness and learning.

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Appendix 1

Criterion	Question	Things to look for
Accuracy	Is the site recognizable as the official local government website?	Logo
		"about"-page
		Introduction
		Header and footer
		Website address
		Website title
	Is the information maintained by the relevant departments themselves?	Logo
		Introduction
		Webpage title
		Header and footer
	Are the authors (or responsible departments) of information recognizable?	Introduction
		Header and footer
		Location of information
	Are the sources of information clearly stated?	References
	Is the spelling and grammar correct?	Correct use of language
Relevance	Does the information focus at public sector and community>	"about"-page
		Introduction
	Does the website have a title and description?	Title in browser window
	Does the information focus at public sector and community?	Topics about public sector and community
	Is the website aimed at residents, visitors and businesses in the community?	Content contains topics of interest to residents, visitors and businesses
	Is the information pitched at the right level?	Use of language
		Amount of "big" words

Completeness	What is the level of detail?	Amount of text
		Amount of information
	Is the information unbiased?	Well rounded argumentation
	Are there any apparent conflicts of interest?	Possible interests of the authors in regard to context and topic
	Is the website rich on content?	Amount of content on the website

Currency	Is the website frequently updated?	Fresh, current information
		Date of last update
	Is it possible to find the date of last update?	Published date of last update
	Is it possible to identify what was last updated?	Change log
	Are the links up to date?	Broken links
		Linked content no longer relevant
	Is the content current?	Date of last update
		Fresh, current information

Accessibility	Does the website have a clear layout?	Easy to identify navigable menus, content and links
	Is the layout consistent throughout the site?	Same position of header, footer, navigable menus, links and content
	Are links and menus easily navigable?	Menus have same position
		Links are easily recognizable
		No “dead ends”
	Is the text well written?	Flow of text
		Use of words and grammar
	Is the website organized according to citizen logic?	Webpage is divided according to topics citizens look for instead of departments
	Is help/support available?	Contact information for support
		Possible other ways to get help (chat, discussion board)
	Is it possible to contact city officials?	List of contact information
		Contact forms
	Are there ways to help locate information?	Search engine
		Sitemap
		Lists with services and subjects
	Are graphics useful and relevant?	Graphics serve a purpose
		Graphics are relevant to content
	Is the site accessible for disabled?	Bobby accessibility tool

Appendix 2

District of Columbia	
Washington	www.dc.gov
Virginia	
Arlington County	www.co.arlington.va.us
Fairfax County	www.co.fairfax.va.us
City of Fairfax	www.ci.fairfax.va.us
City of Falls Church	www.ci.falls-church.va.us
City of Alexandria	www.ci.alexandria.va.us
Town of Vienna	www.ci.vienna.va.us
Town of Herndon	www.town.herndon.va.us
Maryland	
Montgomery County	www.montgomerycountymd.gov
Prince George's County	www.co.pg.md.us
City of Gaithersburg	www.ci.gaithersburg.md.us
City of Rockville	www.ci.rockville.md.us
City of Bowie	www.cityofbowie.org
City of Cheverly	www.cheverly.com
City of College Park	www.ci.college-park.md.us
City of District Heights	www.districtheights.org
City of New Carollton	www.new-carrollton.md.us
City of Takoma Park	www.cityoftakomapark.org
City of Greenbelt	www.ci.greenbelt.md.us
City of Hyattsville	www.hyattsville.org
Town of Brookeville	www.townofbrookevillemd.org
Town of Chevy Chase	www.townofchevychase.org
Town of Garrett Park	www.garrettpark.org
Town of Poolesville	www.ci.poolesville.md.us
Town of Bladensburg	www.bladensburg.com
Town of Riverdale Park	www.ci.riverdale-park.md.us
Town of Barnesville	www.barnesvillemd.com
Town of Glen Echo	www.glenecho.org
Town of Kensington	www.tok.org
Town of Somerset	www.townofsomerset.com
Town of Washington Grove	www.washgrov.sailorsite.net/index2.html
Village of Chevy Chase	www.ccvillage.org
Village of Friendship Heights	users.erols.com/friendshiphtsvillage/