Manager's Guide

Knowledge Management in e-Government

Webocrat as a Knowledge Management Tool?
How we should do it?

Webocrat

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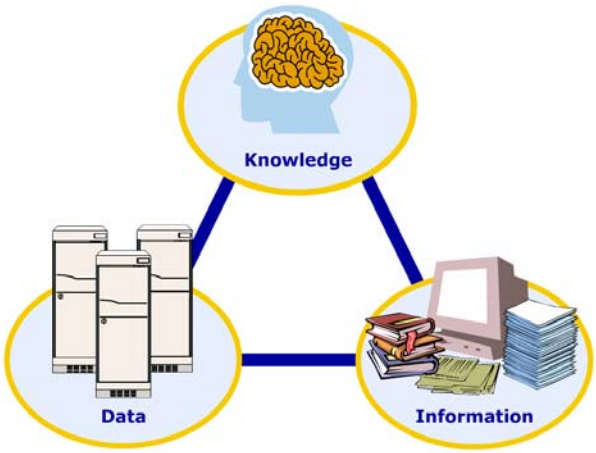


Why Knowledge Management in e-Government?

This chapter will describe what are the requirements, benefits and critical points when moving towards the e-Government state of services.

1 Towards e-Government State of Services

E-Government can be seen as a tool for economic development and more efficient government. An essential part of e-Government should be managing information resources and associations and giving citizens easier access to that information. Technology can help in two respects: storing information effectively and providing means for communication.

1.1 Concepts of Information Society and e-Government

The concept of information society is widely argued and in some cases quite hard to define. In general, information society is a form of modern society, where information is the most valuable asset and most people work with information related tasks. In information society, everyone is empowered with the ability to communicate and access information.

The role of computer technology is significant. However, technology as such is only a part of the whole. It is the usage, understanding, skill lev-

els, and supply of adequate support and infrastructure which will allow for an Information Society to develop effectively. One of the best terms for information society that fits in the picture of e-Government is "communication society".

1.1.1 E-Government

How Should the Concept of e-Government Be Understood?

E-Government can be seen as a tool for economic development and more efficient government. The concept of e-Government holds great potential in helping citizens and businesses find new opportunities in the world's knowledge economy. In a working e-Government the maturity and competence of the organisations and their people are highly valued.

E-Government success requires changing the way government works and how officials interact with the public. Issues such as how government and society process and use increasing amounts of information and how government can be more responsive to citizen needs and input should be focused on. However, often the development directions emphasise the building of technology infrastructure and system development, which should not be the primary goal for e-Government.

1.1.2 Linking e-Government and Information Society

How Does Information Society Link to e-Government?

It is often seen that key to better government leadership is increased public participation in decision-making. New sources of relevant ideas, information and resources are important for the governance when making decisions. Public participation can be achieved by strengthening relations between citizens, government and municipalities.

To enable active public participation, one of the primary functions of e-Government is the creation and dissemination of information. Making use of public services is improved when people can easily find and use information and services across government and municipalities based on their needs and interests. As for the concept of information society, improving on-line access to large amounts of government information is important.

? What should be the goals for e-Government ideology in public and private sectors?

- ☐ *More computers and efficient network connections for the officials.*
- ☐ *Better communication between the citizens, organisations, and local authorities.*
- ☐ *More efficient information retrieval*

Check the correct answers from page 18.

1.2 Requirements for the e-Government system development

A clear vision and priority setting is essential. The necessary pre-conditions for e-Government depend on a society's most important needs. E-

Government projects should be matched up to national strategies and policies. E-Government development is affected by, for example, national infrastructure, level of education, information policies and private sector development.

The top-level requirements for employing e-Government systems include the following:

Why should these factors be considered? See next subchapter!

- Government / Municipality awareness
- Citizen awareness
- Large Internet coverage
- Cheap ICT
- Public funding
- Organisations' active role

What is needed when employing e-Government?

1.2.1 Employing e-Government

Internet coverage

It is vitally important to be able to provide citizens and officials with access to the system. When defining what services will be provided on-line, it should be known, which part of the target group has access to the services.

The quality of the Internet connections should also be considered. Large amounts of data cannot be transferred via Internet with low speed connections. Government policies for Internet coverage building have a significant effect on how large the Internet coverage will be.

Citizen awareness

Defining the e-Government vision needs input from various groups, including government officials and citizen groups. Ultimately, e-Government should be about meeting the needs of citizens and improving quality of life.

The diverse roles that citizens have should be recognized and services targeted to meet the real needs. The more aware the citizens are about the e-Government efforts, especially about e-Government systems employment, the higher and more successful system usage the development team can expect.

Cheap ICT

Citizens participation may in some cases depend highly on the technology they have. To gain more users, there should be reasonably priced ICT available. It might however be difficult to equip all the users with required ICT. To reach also those users, there is a need for public Internet connection points in schools, libraries and Internet-cafes, Internet-kiosks and other similar places.

Government and municipality awareness

The people in leading positions in government and municipalities need to be aware of the e-Government, its targets, means, risks and possibilities. E-

Government must be a shared vision and part of a larger program for reform. If there is no national programme on information society or it is not action-oriented, any kind of e-Government system implementation is extremely hard. To raise the government and municipality awareness, the top-decision makers should be included in a project group.

Public funding

Information policy programs usually define the funding targets regarding e-Government system development. For e-Government system employment projects it is important to be aware of these funding resources. It should also be analysed, which areas of project are already funded by government/ municipalities, and how much financial resources have been allocated to those areas (e.g. Internet coverage in general).

Organisations' active role

Concrete actions usually take place in the organisational and personal level. Therefore it is very important to learn, understand and analyse the organisational structures and processes within them in order to map them into e-Government thinking. Sometimes networks of partner organisations, customers and collaborators force the organisations to complex structures. The evolution of ICT technology, strengthening concept of networking and outsourcing are trends that may reform the organisation structures.

1.3 Change

1.3.1 Change required

Technology is often the most visible part in moving towards e-Government. However, e-Government ideology requires changes in the way government works and deals with information.

E-Government system employment is often a totally new area for many organisations. The whole e-Government system can be based on knowledge management, as it is often done when efficient information storage and retrieval are focused on. Although knowledge management based e-Government system employment projects are close to any large information management development projects, they require a slightly different scope in terms of information sharing between organisations. To enable this, employment projects may require new kind of competence building and organisation wide strategy setting.

How to employ e-Government systems?

1.3.2 E-Government system employment

E-Government system employment requires activities varying from business modelling to dissemination efforts. In the process chart (see next page), a rough idea of how to employ an e-Government system is given.

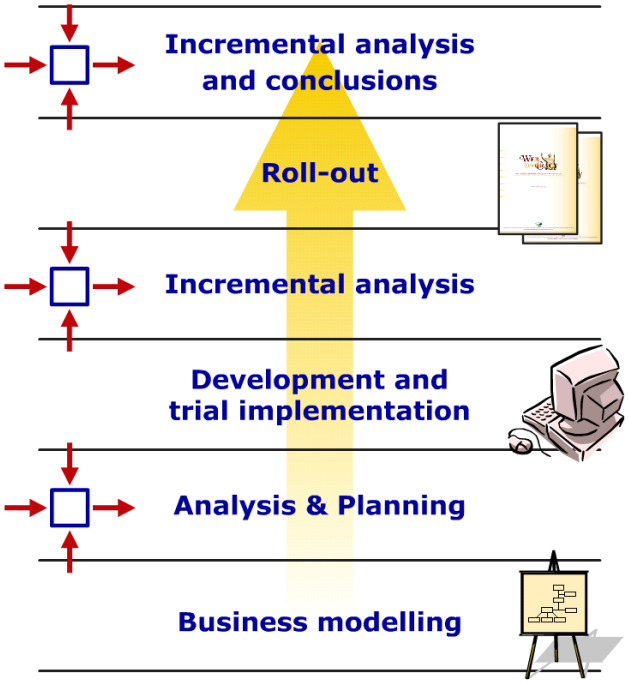


Figure 1: Employment process flowchart.

Step 1: Business modelling

The main purpose of the business modelling phase is to **define the objectives** for e-Government system employment and e-Government in general. The general requirements, scope, schedule and a preliminary employment team should also be defined. The definition is usually derived from the national strategy, information society policies and local needs.

In this phase the technological issues should not play a key role. Instead, e-Government in general and especially its benefits and weaknesses should be discussed. Because there might be a need for external funding, marketing efforts should also start in the beginning of the project. The result of this phase can be documented in a preliminary employment plan.

Step 2: Analysis and planning

The second phase of e-Government system employment includes a comprehensive **analysis on current situation, services and resources**, as well as a detailed employment plan. The analysis is often done in a short time period and if/when new issues occur, they can be considered later in the incremental analysis phase.

In general, the analysis and planning phase should be performed carefully because it sets the basis for the implementation phase.

The results from this phase should include:

- Analysis report
- Development plan
- Updated employment plan

Analysis report

The content of the analysis report always depends on the project scope and target setting. In e-Government system employment the main analysis report usually contains:

- Information model
- Functional process model
- User models
- Maturity model (enhanced with risk analysis)

Typical real life descriptions can also be included in the analysis report.

Development plan

The analysis and planning phase should not only review the history and current state of affairs. Often the current way of working and managing the information need to be changed in order to have efficient e-Government environment. When making the development plan, the current situation should be compared to business modelling targets. Based on comparison, change proposals and reasons for making development actions can be given. All data for development planning comes from the analysis.

Updated employment plan

Typical changes to the employment plan come from the area of user requirements and maturity. Updates are done based on the information received in the analysis phase. The changes vary from minor updates to complete rethinking of the whole business model.

Step 3: Development and trial implementation

The analysis and planning phase is followed by the development and trial implementation. Typically, the primary area of development is to rethink and modify the processes so that they fulfil the requirements of e-Government. The technology used in the e-Government system may also set some requirements for the development work. Usually the process and key competence development is done in trials, where the new or modified processes are being tested by a pilot group of people. In the trials the system is tested, the results can be presented and users motivated. Typically the e-Government technology should be tested in several trials.

Step 4: Incremental analysis

Even though the original analysis has been made carefully, the requirements and targets may change in the trials and in the e-Government system integration and development phase. Any change in the organisation's knowledge model might lead to an evaluation of the e-Government services and system. The evaluation work should be done based on the results of risk and requirements management. The results of incremental analysis phase are similar to the original analysis phase. The only new area in the incremental analysis is that the change effects have to be analysed, too.

Step 5: System roll-out

In the roll-out phase the e-Government system is taken into real-life use. All main services, people and processes are included in this phase. People involved in the trials usually share the knowledge and act as key users helping the new users. If needed, the employment team creates training material and provides training. A successful roll-out is well scheduled and organised. It requires a lot of background work in the form of piloting, testing, marketing and training.

Step 6: Incremental analysis and conclusions

After the system roll-out an additional analysis round should be performed. In this analysis, the employment team should check whether the system fulfills the needs and targets that were set in the first two phases. All the features of the system cannot be tested even with successful trials. Feedback for future projects is needed from

- System capacity
- Overall process performance
- Users' reactions
- Quality of services

1.4 Summary

E-Government can be seen as a tool for economic development and more efficient government. An essential part of e-Government should be managing information resources and associations and giving citizens easier access to that information. Technology can help in two respects: storing information effectively and providing means for communication.

There are a few necessary pre-conditions for e-Government: government and municipality awareness, citizen awareness, large internet coverage, cheap ICT (information and communication technology) and public funding. These pre-conditions should be taken into account when planning the e-Government system employment project.

Moving towards e-Government should not include technological reforms only. The e-Government system employment project should go through a series of analysis and development stages, where the organisational structures and business models are considered.

2 Knowledge management in e-Government

2.1 Knowledge Management (KM)

KM can be characterised as a technology that enables the sharing of ideas and information as well as the rapid creation of new knowledge. In the context of e-Government, these factors should increase efficiency, innovation, the quality of goods and services as well as equity. KM can be thought of as a process through which organisations generate value from their intellectual and knowledge based assets.

Information inside organisations is typically stored in several places. A common problem is that a great deal of useful knowledge is only stored in the minds of employees. Capturing and codifying that knowledge is the challenge KM technologies aim to answer. In addition, KM aims to enhance communication, information transfer and collaboration. Many knowledge management projects undertaken by organisations are a mix of both information and knowledge management.

What is the difference between knowledge and information management?

2.2 Linking knowledge management to information management

Knowledge management and information management are sometimes used interchangeably. However, it is important to understand the differences. While information management concentrates on generating, accessing, storing and analysing data, knowledge management aims to enhance knowledge generation, codification and transfer. Knowledge management is about helping people to communicate and share information.

For knowledge-intensive organisations it is important to make the best use of information gathered from various information resources. Not all information is valuable, however. Many organisations stick to the idea of gathering data instead of information and knowledge. There is a profound difference between these forms of information.

Read forward to see the difference for yourself.

2.2.1 Defining knowledge

Information can be divided into three categories: knowledge, data and information.

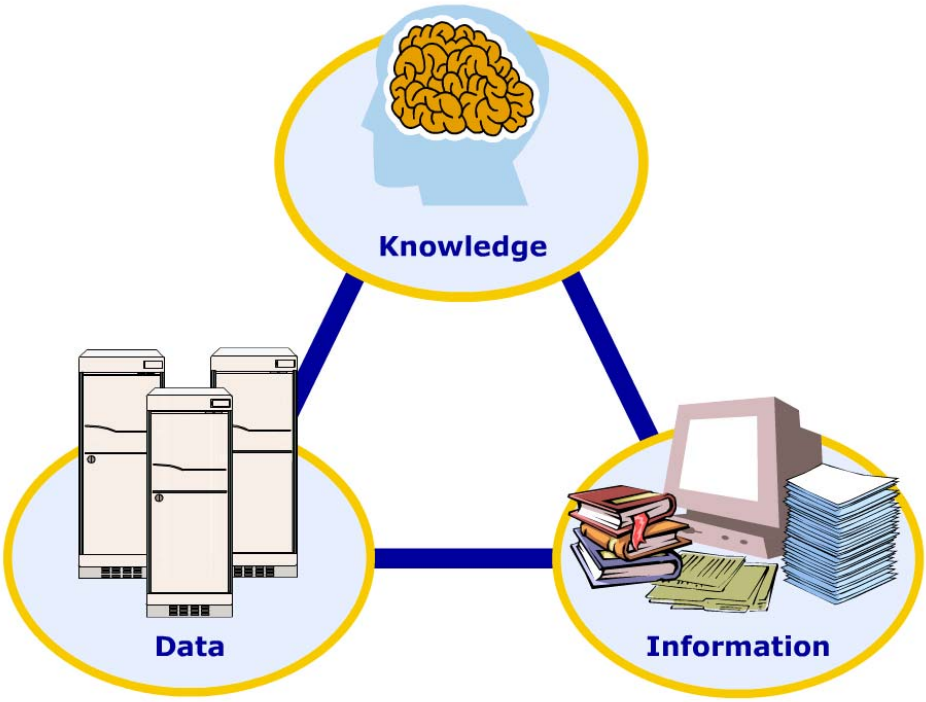


Figure 2: Knowledge vs. data vs. information.

Knowledge

Relevant information available in the right place, at the right time, in the right context and in the right way can be called knowledge. It can be defined as actionable information. It depends on other knowledge to build on. Knowledge creation is, in fact, a process of value addition to previous knowledge through innovation.

In organisations knowledge becomes embedded not only in documents or repositories but also in organisational routines, processes, practices and norms.

Data

Data means a set of facts, which do not say anything meaningful without a particular context. To transform data into something more relevant and meaningful, it has to be analysed and given a context.

Information

Information means processed data that simply gives us the facts. It is easily expressed in written form.

It can be packaged into a reusable form and handled by information systems. In today's world, there is sometimes more information available through the Internet than people can handle. Information needs to be read, manipulated, analysed and communicated from one person to another before it can turn into knowledge.

2.2.2 Explicit knowledge

Explicit knowledge means knowledge that can be codified and transmitted in a systematic and formal language: documents, databases, webs, e-mails, charts etc. Explicit knowledge can be found in documents of an organisation: reports, manuals, correspondence (internal and external), patents, pictures, tables (e.g. excel sheets), images, video and sound recordings, software etc. As a general rule of thumb, explicit knowledge consists of anything that can be documented, archived and codified, often with the help of IT.

2.2.3 Tacit knowledge

Tacit knowledge is personal, context-specific knowledge that is difficult to formalise, record, or articulate. It is often achieved by individual experience and is mainly developed through a process of trial and error encountered in practice. For example intuition, assumptions, values and experience are forms of tacit knowledge. Tacit knowledge is most often stored in the heads of people. The challenge inherent with tacit knowledge is figuring out how to recognise, generate, share and manage it.

2.3 Why KM?

The accumulation of knowledge has played an important role in the transformation from an agrarian society to the information society. KM is recognised as a key enabler of internal efficiency across many types of companies and various vertical industries. In the private sector KM is important for improving the productivity and internal efficiency. The reasons for knowledge management include:

- The need to avoid repeated and expensive mistakes
- The need to avoid unnecessary reinvention
- Failure of organisations to know what they already know
- Emergent need for smart knowledge distribution
- The emerging need for competitive responsiveness
- To avoid the tacit knowledge walkouts
- The need to support effective cross-functional collaboration

How does KM fit into the context of e-Government?

2.3.1 E-Government sector

The government sector has a slightly different perspective to KM than the private sector. In contrast to the private sector, the government's ultimate goal is to better serve its citizens. However, the driving principles behind KM in government remain quite consistent with the KM drivers in the private sector.

The core process of government and municipalities is decision making. Decisions are made based on information received from various sources. From the citizen or business point of view, e-Government systems enable their participation in local authority decision making by helping them express their opinions and views on various subject matters. Knowledge management is needed to improve decisions, whether they are about a policy, a budget, or services targeted to citizens.

What specifically are the drivers for KM in the e-Government sector?

2.3.2 Drivers for Knowledge Management (KM)

The drivers for KM are quite consistent within the government and business sectors.

? Which of the following can be considered as key drivers when employing knowledge management in e-Government?

- ☐ *Employees can't find critical existing knowledge in time*
- ☐ *Organisations don't know what they already know.*
- ☐ *KM Technology provides advanage.*
- ☐ *No knowledge is gained from failures.*
- ☐ *Expertise is not shared.*
- ☐ *Departure of key competence causes loss of best practices.*

Check the right answers and explanations from page 18

2.4 A Case Study: Webocrat

In the e-Government context, one approach to knowledge management is Webocrat. Webocrat provides tools for capturing and updating tacit knowledge connected with particular explicit knowledge inside documents. This is possible due to an ontology model, which is used for representation of organisation's domain knowledge. Ontology with a syntax and semantic rules provides the language by which Webocrat(-like) system can interact at the knowledge level.

Use of ontology enables to define concepts and relations representing knowledge about a particular document in domain-specific terms. In order to express the contents of a document explicitly, it is necessary to create links between the document and the relevant parts of a domain model. This means linking to the elements of the domain model, which are relevant to the particular document. Model elements can also be used for intelligent search and retrieval of relevant documents.

2.5 Summary

KM can be characterised as a technology that enables the sharing of ideas and information as well as rapid creation of new knowledge. In the context of e-Government, these factors should increase efficiency, innovation, the quality of goods and services as well as equity.

KM is recognised as a key enabler of internal efficiency across many types of companies and various vertical industries. From the citizen or business point of view, e-Government systems enable the participation in local authority decision making by helping them to express their opinions and views on various subject matters. Knowledge management is needed to improve decisions, whether they are about a policy, a budget, or services targeted to citizens.

In the e-Government context, one approach to knowledge management is Webocrat. Webocrat provides tools for capturing and updating tacit knowledge connected with particular explicit knowledge inside documents.

3 Challenges of Webocrat

3.1 Leadership

For e-Government projects to succeed, there has to be a sincere desire among the leaders in the community to implement such a system. There have to be people who support its implementation in difficult situations. Lack of commitment by elected representatives and senior managers can lead to a failure when implementing e-Government systems. The right leader has authority and is willing to commit time for development work.

Crucial for success is capable management. The co-operation of government agencies and private sector partners has to be managed effectively. There has to be management at both the national and the project level. The project management team should have sufficient authority from political leaders.

3.2 Funding

Crucial for success is incorporation of the system in the annually prepared local budget. E-Government system development and employment should be a specific item in the budget. Due to citizen pressure to direct spending at housing, transport, health care and education, many local authorities have not seen IT and delivering services with its assistance as a priority. Because of this, much of the infrastructure and hardware is outdated and does not meet modern demands. This means additional expenses due to e-Government systems: new computers, new cabling, new software, extra computer lessons etc.

3.3 Citizen awareness

If the general public does not have basic ICT competence it is extremely hard and expensive to employ any system. Also the high usage and the benefits of the system may not be gained if the users have difficulties in basic ICT issues.

Emphasis should be put on

- how to make the system look relevant to citizens
- how to facilitate constructive discussion on-line
- how to avoid failures in security or privacy

Especially failures in security or privacy may result in lack of public trust. When starting an e-Government system employment project, citizen awareness in e-Government, IT and especially web technology should be measured. Enough resources should be allocated to bring the citizen awareness into reasonable level.

3.4 Service culture

E-Government requires a shift in corporate culture towards a citizen focus and a change in the way most services are organised and delivered. Unless strongly driven from the top by a committed leader with the power to impose change on this scale, the e-Government system employment project will not succeed. It therefore involves

- persuasion
- marketing the concept to colleagues
- promoting successes
- encouraging citizens to demand change

This can be a slow and laborious process. E-Government in general is a much bigger project. It involves people in internal ICT section, large amounts of capital investment and a change in the whole approach to service delivery and information management.

4 Answers to Managers Guide questions

? What should be the goals for e-Government ideology in public and private sectors?

☒ *More computers and efficient network connections for the officials.*

☑ *Better communication between the citizens, organisations, and local authorities.*

☑ *More efficient information retrieval*

An essential part of e-Government should be managing information resources and associations, as well as giving citizens easier access to that information. Technology can help in two respects: storing information effectively and providing means for communication. Improving technology itself should not be the goal for e-Government.

? Which of the following can be considered as key drivers when employing knowledge management in e-Government?

☑ *Employees can't find critical existing knowledge in time*

This can be considered as one of the key drivers for KM. Information exists in organisations in various forms. It can be tacit or explicit. Tacit knowledge often fails to show up in documents. Being able to find the information resets on how well information is collected, processed and analysed. Knowledge management system does not need to solve all content management system problems, but it needs to have a mechanism of managing information resources and associations.

☑ *Organisations don't know what they already know.*

This can be considered as one of the key drivers for KM. In many cases the possibility to reuse knowledge or even awareness of existing knowledge is limited. As a result of this, already gained knowledge can be forgotten in relatively short time. Information can be gathered from various resources inside and outside the organisation. Having a mechanism for managing these information resources and associations can benefit work performance.

☒ *KM Technology provides advanage.*

KM technology as such should not be considered as key driver for knowledge management system employment. Knowledge management systems should provide processes to retain tacit knowledge through informal methods and pointers. Using advanced technology does not itself solve knowledge management related problems. The key to successful knowledge management lies in utilising technology in applying knowledge into practice.

☑ *No knowledge is gained from failures.*

This can be considered as one of the key drivers for KM. Failed approaches and decisions often provide equally useful insight into what not to do. Without learning from failures and their analyses, workers pursuing current projects might unknowingly repeat past mistakes.

Having mechanisms to capture this experience gives the possibility to use and benefit from existing knowledge.

☑ *Expertise is not shared.*

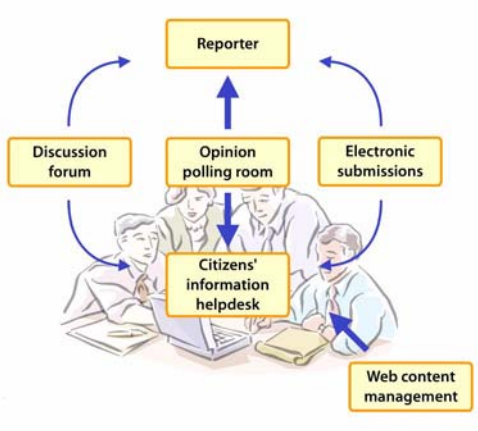
This can be considered as one of the key drivers for KM. Knowledge grows in value if it is appropriately shared. If the expertise of skilled people cannot be shared, it can lead to inconsistent performance across locations and expertise localisation. In the long run, it can damage the way an organisation works.

Having mechanisms to capture this expertise gives the possibility to use and benefit from existing knowledge.

☑ *Departure of key competence causes loss of best practices.*

This can be considered as one of the key drivers for KM. When tacit knowledge walks out of the organisation, capabilities can be lost at the same time. This may lead to severe difficulties in performing tasks critical to organisation's success.

Having mechanisms to capture these capabilities gives the possibility to use and benefit from existing knowledge.



Webocrat as a Knowledge Management tool

This chapter will describe the Webocrat as a knowledge management tool and provide you information needed in making decision between different KM tools for e-Government.

1 Requirements for a Knowledge Management tool

1.1 Defining the requirements for a KM tool

The requirements set for a knowledge management tool depend on the organisation's structure, processes and needs. A common starting point for defining the requirements for a given organisation is to chart the organisation's knowledge and information flows and then evaluate how various tools can support the process. However, as the majority of knowledge management tools are tied to the Internet and the Web at least on some level, there are certain features that are desirable for any knowledge management tool.

- Support for Web publishing
- Document Management for Web
- Content-based search and retrieval
- Data or text mining
- Methods for describing topic relations

- Knowledge modelling
- Organisational memory gathering

1.2 Comparing KM tools

The need to store the accumulated knowledge is an activity that all organisations are familiar with to some extent. One easy method for comparing the tools available for the purpose is to look at how easy it is to retrieve the stored information from the system, for example how the stored knowledge or content can be searched for, and how it is cross-referenced or categorised.

Webocrat's ontological information linking model allows for descriptions of complex relationships between information items. Unlike a conventional hierarchy which cannot be easily expanded once defined, an ontological model is freely expandable and can accommodate new concepts and fields.

Building an ontology and the resulting network of connections between information items not only helps in organising the content but also builds up important metadata. The Fulltext search tool in the Webocrat user interface uses this relational information to produce more accurate search results.

1.3 Applications

The following scenarios describe typical problem areas in local government. The solutions to these problems have potentially a great impact in the community's everyday life.

1.3.1 Citizens

For the ordinary citizen the various forms and other paper-based submissions to be delivered to the local authority present a challenge at times. Probably the citizen would need to find the bureau in question, go there during office hours and perhaps meet with an official to get the needed material or form.

Is there a way to make the routine more efficient?

Access to information

The importance of providing public access points to the e-Government services is often overlooked. Not everyone has the equipment or is indeed even inclined to use Internet at home. Proprietary or single-technology solutions that become outdated or are tied to certain hardware like a given vendor's smart card readers make it difficult to build enough cost-effective access points to the system.

The Webocrat solution

Webocrat can be utilised effectively in distributing paper forms to the citizen users. Through the Webocrat system the citizens can access the forms and other paper-based documentation used by the local authority either in electronic format that can be filled on-line or as printable document templates. This way information and even services can be made available regardless of office hours or physical access.

1.3.2 Public access

Readily available public access to the Internet is nowadays a reality almost everywhere. Access points in Internet cafes, libraries, and other public locations proliferate as technology matures. Wireless Internet access is also entering territory that has not necessarily ever seen a fixed land telephone line.

What if the march of technology could be harnessed to aid the local government in communicating with the general public?

Access everywhere

The importance of providing public access points to the e-Government services is often overlooked. Not everyone has the equipment or is indeed even inclined to use Internet at home. Proprietary or single-technology solutions that become outdated or are tied to certain hardware like a given vendor's smart card readers make it difficult to build enough cost-effective access points to the system.

The Webocrat solution

The Webocrat system is built on top of open standards and does not require specific equipment. The citizen user interface is completely Web-based and can be accessed from practically anywhere by using generic browser software, portable Internet appliances, or other Web-enabled tools.

1.3.3 Local administration

Both the office holders and the elected officials of a local authority aim to base their decisions on public opinion. The most generic, visible and far-reaching issues in a community are usually easy to gauge with the standard methods of, for example, assistants' reports, networking, NGO involvement, and directly from citizens.

But how to find out about issues that are not as easy to come by?

Tools for the administration

It is the small important issues of everyday life that are difficult to address as, by their very nature, they tend to be too common or mundane to garner enough notice. However, things like street lighting, service in the local library or the timetables for kids' practice hours at the local sports venue make up the everyday life experience and thus need attention just like the public building projects or allocation of services. The problem is, things like these rarely show up on official reports.

The Webocrat solution

The Webocrat system offers a two-fold solution to this problem. First, the polling tool of the Opinion Polling Room module can be used to stage public opinion referendums. Secondly, the powerful Reporter module can gleam information from all documents stored in the Webocrat and form concise multiformat reports for the local authority user who needs to stay on top of things. For example, the relevant officials can be notified of postings to the Discussion Forum that are in their field of expertise.

1.3.4 Business sector

Participants to the local authority's tenders are another likely user group that often spends considerable amount of time submitting information to the authorities.

How could this process be streamlined?

Services for local businesses

Sometimes a time-consuming tendering process which may require multiple visits to different offices could make it difficult or even impossible for small or mid-sized local companies with limited personnel resources to participate in public tenders.

The Webocrat solution

The Webocrat Tender module streamlines the process of designing, publishing and following up on the public tenders put out by the local authority. Both the local authority and the participants to the tenders stand to benefit from the easy to use Web interface that can be accessed with equal ease from either a stationary computer or a html-capable mobile device.

1.4 The Webocrat solution

1.4.1 Introduction to Webocrat

Webocrat is a Web-based e-Government enabler solution that combines a powerful knowledge management technology backend with a fully customisable Web user interface. The Webocrat solution consists of independent modules that can be installed either as a complete system or as standalone enhancements to existing systems.

This section describes the Webocrat modules. The modules are:

- Reporter
- Discussion Forums
- Opinion Polling
- Electronic Submissions
- Citizens' Information Helpdesk
- Web Content Management system

1.4.2 Potential user groups

The Webocrat system provides functionality for three very different user groups. For this reason the system is divided into independent modules that can be utilised in varying combinations or separately.

Local authority users

Local authority users include the elected officials (council members) and administrative workers (clerks).

For representatives of the local authority the Webocrat system offers a comprehensive report generation tool that gathers and collates citizens' opinions.

The reports can take the form of e-mails or paper-based documents so that they can be viewed at leisure, in or out of office and if need be without an Internet access or a computer.

Citizen end users

Citizen end users can be, for example, non-government organisations or interest groups, private citizens, or from the local businesses.

Most features of the Webocrat system benefit the citizen user:

- The Electronic submissions is a convenient way to approach local authority: The system scans the content of the submissions, whether they are e-mail, text documents or Web-based forms, and forwards them to the relevant recipient(s).
- Webocrat's Discussion Forum and Polling Room are electronic community enhancing features that encourage the public to voice their opinions in an informal setting.

Webocrat system administrators

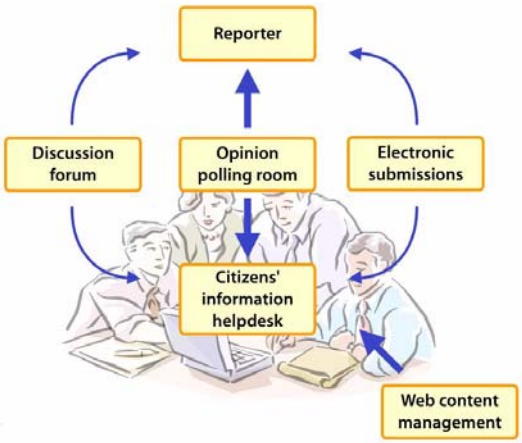
Webocrat system administrators are, for example, on the local government's payroll, an outsourcing partner or independent consultants. They take care of the Webocrat portal.

System administrators and designers can apply the Webocrat Web content management tool module for effective management of the material stored in the system.

The Webocrat content management solution facilitates typical Web-based content management operations, but it can also be used to manage the underlying ontology.

1.4.3 Webocrat modules

The boxes in the diagram to the left represent the Webocrat modules.



Reporter

The Reporter is a tool for the local authority. It allows the user to aggregate information and generate reports. The Reporter is especially well suited for off-line mode of operation.

Using the Reporter members of the local authority can generate statistics, alerts, and summaries of the information stored in the Webocrat system.

The two main purposes for the Reporter system are:

- Generating reports of all the information types in the Webocrat system.
- Monitoring particular documents and sending change notifications.

The local authority can combine the Reporter with for example the Discussion Forum or the Opinion Polling Room modules to generate reports of the opinions that citizens express in those modules.

In addition to monitoring the electronic submissions from local government stakeholders, the Reporter module can be set to also monitor the contents of the Documents module to give concise information about recent additions and changes.

The Reporter is capable of gathering information from all the documents that have been stored in the system, along with any submitted contributions, and recorded opinions.

The Reporter module sends an automatic notification if information the user is interested in is modified or new potentially interesting information enters the system.

Discussion Forum

Discussion forums are one of the Internet's most popular services. This module enables the users to contribute to discussions and/or read material produced by other users of the system.

An Internet discussion forum is a place where people with shared interests (for example a common hobby or profession) can exchange opinions and participate in a virtual community. The aspect of communality makes the forums a popular service among both the novice and expert users.

The discussions usually follow the general theme of the forum (for example gardening, car repairs, childcare, or computer hardware), but at times the conversation can get very specific when someone posts an interesting topic and the other users comment on it. For this reason Internet discussion forums are often seen as a valuable source of expert advice or commentary: a forum can be highly specialised and it is likely that true experts in a given field are attending discussion forums.

In Webocrat, the Discussion Forum module provides a way to attract the community-minded Internet users to the site, but more importantly it is a place for discussions between the citizens and the government representatives. In one of the Webocrat trials the forum was frequented by select local government authorities who answered the citizens' questions that were in their own field of expertise.

Opinion Polling Room

Citizens' opinions on different topics are key to good decisions. The Opinion Polling Room is an opinion polling tool for the local authority, and pro-

vides the means for ordinary citizens to participate in the decision-making process.

Opinion polls of all kinds have been a staple feature on the Web for years and most intermediate and advanced Web users are accustomed to seeing and using different polling solutions.

In the Webocrat system the opinion gathering module can be used to post Web-based polls on the site. The system activates pollings that have been stored in the system automatically according to the starting and closing time settings. After the users have given their answers either in free-form text or, more commonly, by yes/no or multiple choice selectors, all raw data processing is done automatically. The administrators of the Webocrat system can further process, evaluate, and finally publish the resulting data.

Opinion polling process

Standard HTML Web forms are used to collect the polling data. This solution enables most browser technologies including legacy and mobile platforms.

In the standard configuration the whole process of collecting users' opinions is handled by the module automatically. The administrator can further refine the polling results, for example to create customised results lists, perform analysis, or export the results into other documents.

After a polling has been closed and processed, users of the Webocrat system can review the results on a Web page.

The layout of the results page is freely customisable. Most results pages display per question the number of votes cast and the resulting answer percentage.

Advantages of electronic polling

Compared to traditional referendum methods an electronic polling system has certain distinct advantages:

- **Convenience**: Generally people don't mind answering to traditional opinion polls in public locations but they rarely go out of their way to participate. When pollings related to local authority activities are made accessible on the Web the number of participants and the breadth of a polling can increase significantly, especially with the widespread adoption of Internet appliances.
- **Anonymity**: There is no correspondence between a particular voting record and a certain user. The access level based security approach guarantees that no user can be identified through electronic eavesdropping or man-in-middle type attacks.
- **Security**: It is not possible to change the results by hand. Customisations that are made to the layout or presentation do not affect the actual polling results.
- **Objectivity**: A single user can answer to a question only once. Multiple answers from the same user are not possible.
- **Effectivity**: Physical pollings are resource-intensive and require careful planning in order to yield results representative of the general populace's opinion.

Electronic opinion polling is potentially more cost-effective and representative, if planned and executed with similar care as physical pollings.

1.4.4 Electronic Submissions

The Electronic submissions allow citizens to submit their formal or informal contributions to the local authority.

One of the main obstacles ahead of widespread e-mail use throughout the society is the fact that the sender must have detailed contact information if the correspondence is to reach the recipient.

When using e-mail, there is nothing like the diligent clerk who sorts an organisation's incoming mail and delivers it to the correct recipients even if the addresses may be lacking.

In the Webocrat system this common problem is met with the Electronic Submissions module. With the help of the Electronic Submissions module the citizens can contact the relevant local authorities by e-mail or Web-based forms even if they do not know the recipient's name or address.

The Webocrat backend sorts both the Web-based and e-mail submissions automatically according to the content and possible metadata like department name, and delivers the correspondence to the correct recipient(s).

1.4.5 Citizens' Information Helpdesk

Citizens' Information Helpdesk is the Webocrat user interface for citizens. It is a powerful search tool providing an easy way to access the stored information based on metadata, free text, and concept indexing.

Experienced Web users are likely to use a search tool rather than the navigation tools provided in the user interface. The Citizens' Information Helpdesk is a tool for searching for all kinds of content stored in the Webocrat system: Through this module the users can find for example HTML and Word documents, and e-mails. Two basic models of retrieval can be distinguished:

Exact retrieval tries to find documents the conceptual descriptions of which match the query exactly. In other words, the neighbourhood size is set to zero and only concepts given in the query will be taken into account.

Approximate retrieval is based on the similarity of concepts. It returns every document connected to the concepts, which are close to the concepts mentioned in user's query.

Category browsing

Categories are a familiar feature on Web portals and directory services. Yahoo or Google Directory are well-known examples of directory-like user interface metaphors. It is likely that the novice users will prefer this method over other, more novel navigation methods like using a search function.

Browsing through a category metaphor is a convenient method for trying to find connections between topics of interest or when a starting point is

known but further information is needed. Category browsing is also a good method for finding information that is not known exactly.

Categorised information can be retrieved through reference or likeness. For example, "Housing" could bring up information on both the different locations in the region or different housing schemes that have been made available in the area.

Fulltext search

The search functionality is gaining popularity throughout the Net and it is likely that intermediate to advanced Web users are comfortable using a search to find information that they know to exist.

With the fulltext search function the user can search for any text in all of the documents stored in the Webocrat system. The ontology-based Webocrat search can index almost all content on the site, including the discussion forum that is often difficult to index with conventional search tools.

1.4.6 Web Content Management

Through the Web Content Management module users in both the citizen and the government user groups can prepare, publish, and access documents.

The Webocrat Web Content Management system (WCM) supports the publication of documents that are of interest to the citizens and different interest groups. Examples of documents that can be published include laws, resolutions passed, budgets, reports on activities carried out by the authorities etc.

The WCM module provides the means to manage the publishing space. With the help of this module the system administrator can prepare different types of documents for publication (link them to elements in the domain model), publish the documents, and easily access them after they are published.

CMS solutions

Most corporate and government organisations already employ a content management solution in order to handle the ever-increasing amount of information they make available on their Web sites.

Some CMS solutions have a system administrator's perspective and aim to help in the technicalities of production, others have grown out of Web design tools and are very well suited for layout design, and yet others take the end users as the starting point and try to enhance the user experience.

Webocrat-enhanced CMS

In one of the Webocrat trials the council had acquired a major Web content management system independently of the Webocracy project. The Webocrat content management system was not expected to replace or duplicate the facilities provided by the existing system but to provide additional functionality and content for the standalone application.

The added value in the WCM system was primarily due to the knowledge model approach.

Integrated Webocrat (5/5)

Webocrat Web Content management module can also be installed separately of the rest of the modules and integrated tightly with an existing system.

In another Webocrat pilot, Webocrat and a legacy system exchanged data in XML format. This way the legacy system could take benefit of the functionality of the Webocrat content management module. This implementation reduces the workload as the WCM module registers all electronic submissions automatically.

2 Overview of the Webocrat system

2.1 Webocrat user interface

This section gives an overview of the functionality of the various modules in the Webocrat system user interface. The fact that the Webocrat user interface can be configured and customised freely means that the user interface in the examples may or may not bear resemblance to other Webocrat user interfaces, notably the reference user interface.

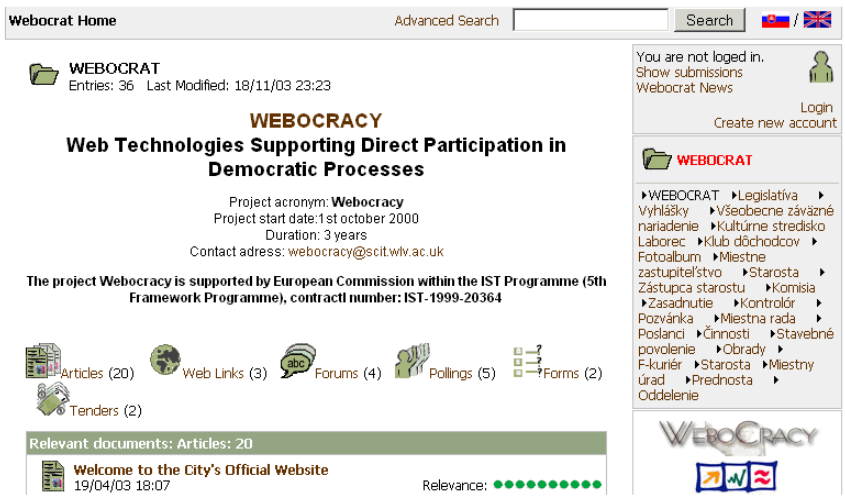


Figure 1: User Interface.

The modules covered described here are:

- Documents
- Discussion forums
- Electronic polling
- Web links
- Tenders
- Webocrat Administration interface

2.1.1 Documents view

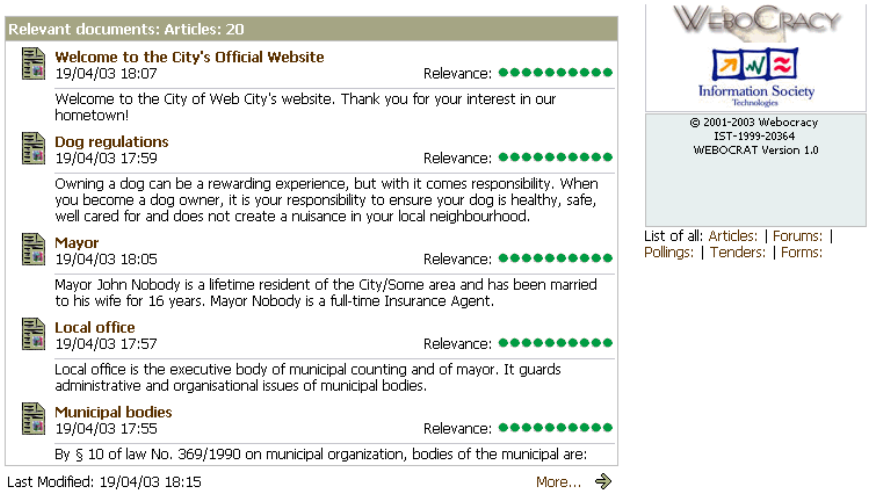


Figure 2: Documents view.

The Documents section can be used to post news and to give the users access to documents that have been deemed relevant. The documents appear in a list down the page, and the list can be sorted according to date, name or relevance.

2.1.2 Discussion Forums

The user interface of the Webocrat Discussion Forums module is customisable in order to ensure a uniform look with existing Web-based solutions. In the Webocrat trials, standard user interface guidelines have been adopted and the layout follows the generic Web conventions for a discussion forum.

Topics appear in a list spanning the whole length of the page, for example:

- The number of replies that tells how active the discussion is
- When a reply or a change was last made to the topic, showing how recent the topic is
- The name of the user who last added a comment to the topic
- Counter for how many times the topic has been viewed, shows popularity

2.1.3 Electronic Polling

The Polling feature is often represented with a Web form, while multiple choices in a form is a common poll layout. Freeform text entry fields enable the users to answer in their own words, but this makes automatic handling almost impossible. However, sometimes the freely formulated answers are worth the extra effort needed in processing them.

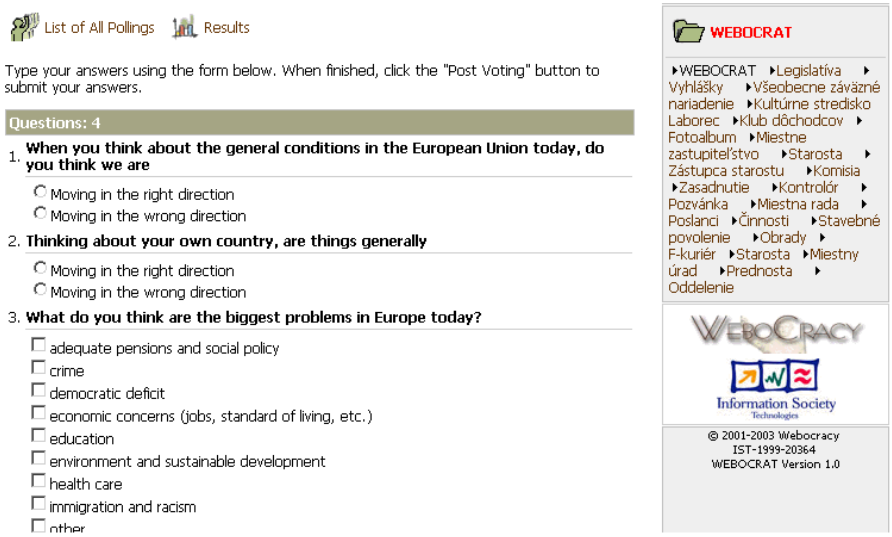


Figure 3: Polling view.

Creation of an opinion poll is a task for administrators. An administrator uses a specialised web interface for maintaining polling definitions. The administrator can modify the graphical layout of the Polling Information Sheet and the Opinion Polling Sheet. A set of documents or concepts relevant to the polling can also be specified here. Related documents can give for example further information on the subject of the poll, something the citizens taking the poll may find helpful.

Opinion polling is activated and deactivated automatically, according to the starting and closing date settings. Activation means that the polling sheet is available for citizens to answer the questions, in addition to alerting defined user groups that the poll is now online.

After the closing date has passed, the polling sheet is no longer available for users and the polling is closed. Results of the polling are evaluated and published automatically.

2.1.4 Web Links

In the Web Links module the operator of the Webocrat system can store and showcase links that the users might find interesting. Examples of such links could be the home page of the local municipality or city, local public service listings, or a nationwide public sector service portal.

2.1.5 Tenders

The Tenders page lists all the tenders the local authority has put into force.

The list of tenders contains the deadline, contact information, and further details. These can be defined in the administration tool.

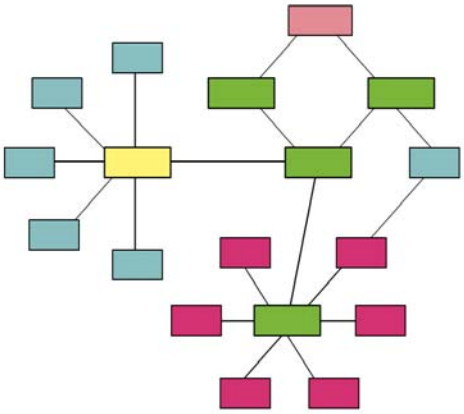
Administrator interface

In the Webocrat's Administrator user interface the administrator of the system can define for example the title, reference number and other meta information pertinent to the tender.

2.1.6 Category Browsing

This standard and familiar navigation tool makes sure that most users will know how to operate the main browsing metaphor of the Webocrat user interface. The familiar category metaphor invites the user to browse the site by viewing the nested content. Majority of the content in Webocrat is displayed using the category browsing metaphor.

The category seen in the user interface is in fact just a convenient representation of a larger concept inside the system: Webocrat is built on top of a powerful ontological model, or hierarchical description of content. The ontological backbone makes it possible to classify all information inside the system, which in turn enables the use of automatic processes in managing the content. The ontology can be expanded freely with the Webocrat system administration tools to include all future content.



How should we do it?

This chapter will explain how you can introduce knowledge management in your organisation and use it in e-Government projects.

1 Roadmap to Knowledge Management

1.1 Introduction

The Roadmap to Knowledge Management section briefly describes the measures you should take if you want to use a Knowledge Management approach in managing the information in your organisation. It describes the steps for introducing the knowledge management model that is at the heart of the Webocrat system.

Roadmap to Knowledge Management is based on the book The Knowledge Management Toolkit by Amrit Tiwana.

1.1.1 Step 1: Analyse existing infrastructure

Start by analysing your organisation's needs, identify critical gaps in the organisation, and build the knowledge-based e-Government system over your existing systems.

- Analyse your information infrastructure (internet and extranet) and build the e-Government system on the communications system and management system that might already be in place.

- Integrate existing networks, intranets, and groupware into the knowledge-based e-Government system.
- Analyse the limitations of the tools your organisation is currently using and identify gaps in your existing technology infrastructure.

A good knowledge management system must recognise how employees work and build technology solutions to be able to use and facilitate these processes. The system needs to support innovation, collaboration, conversation and knowledge sharing to become a success.

1.1.2 Step 2: Align organisational strategy, KM and e-Government

For a knowledge management system to be successful, you need to analyse the relationship between knowledge management, organisational strategy and e-Government.

Knowledge and e-Government drive strategy and vice versa. Without a clearly articulated link between them, your effort will probably fail even with the leading-edge technology.

By using various KM strategies you can translate strategic vision into a supporting knowledge strategy. Here are some strategies you can use:

- Perform a knowledge-based SWOT analysis and create knowledge maps for the cooperating organisations, customers, and society as a whole. These maps will help you figure out which areas of knowledge are empty, slightly lacking, or weak.
- Analyse knowledge gaps and identify how a knowledge-based system can fill those gaps.
- Before designing the e-Government system, determine the right diagnostic questions to ask.
- Translate the link between the strategy of your organisation and the knowledge-based e-Government system to system design characters.
- Mobilise initiatives to help sell the e-Government initiative internally.

How can you identify knowledge gaps?

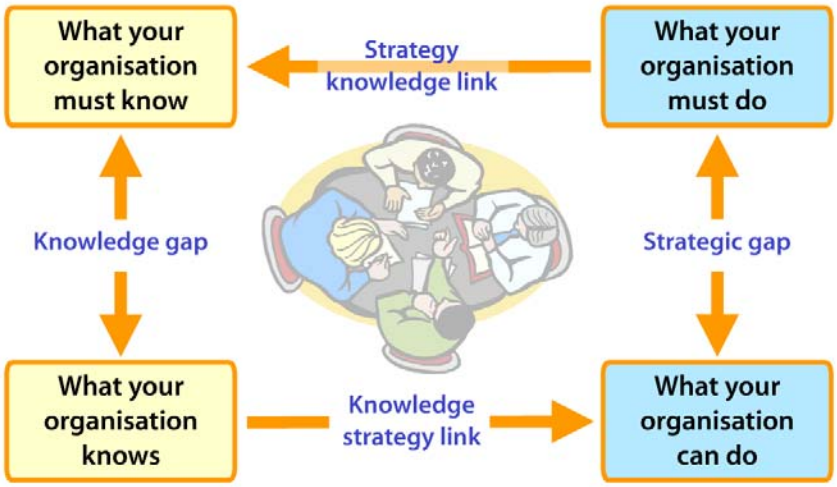


Figure 1: Identifying knowledge gaps.

What your organisation knows

Your organisation knows how to offer its current services in the traditional way. Some of these services may already be in electronic form.

What your organisation must know

Your organisation must offer a wider selection of new services. For example, an e-Government policy might have been created, requiring that all applicable services must also be offered as e-services.

Often these services have been defined by the law or by a government initiative, but local authorities can also decide to offer e-services on their own initiative.

The knowledge gap is represented by what your organisation should know and what it does know in order to reach its e-Government goal.

What your organisation can do

Your organisation knows how to fulfil its current responsibilities defined in the law and does so in the traditional way.

What your organisation knows and what it can do forms its knowledge-strategy link.

What your organisation must do

To reach its e-Government goal, your organisation must carry out all the changes defined in the laws and in the national or European e-Government or e-Democracy initiatives.

What your organisation must do and what it must know represents its strategy-knowledge link.

What your organisation is doing and what it should be doing represents its strategic gap. For example, it might expect citizens to make their inquiries in person or by phone instead of using email.

Conclusion

The gaps you have identified must be aligned and they must feed into each other to bridge existing gaps.

Transfer this knowledge to KM design. Raise KM platform design to the level of organisational strategy and pull strategy down to the level of systems design.

Strengthen the knowledge about the strategic gaps in the areas which your organisation considers its priorities.

1.1.3 Step 3: Perform knowledge analysis and audit

To find out what knowledge your organisation possesses and what it might need to meet its strategic goals, you need to conduct a knowledge audit. Begin by analysing what your organisation is doing and the type of services it provides and do an audit of the knowledge that is necessary for delivering these services:

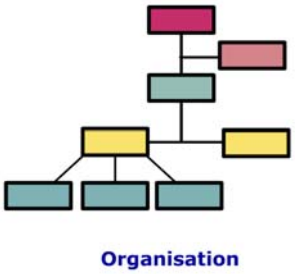
- Identify, evaluate, and rate critical process knowledge.
- Select an audit method and a knowledge audit team.
- Audit your organisation's knowledge and its existing processes, information, and services.

The knowledge audit gives you information about where the strengths of your organisation lie and indicates areas and processes that can benefit from KM the most.

Having conducted the audit, you can appropriately position and scope your KM initiative and decide on the structure of the implementation team.

Knowledge audit and analysis

1. Analyse the organisation

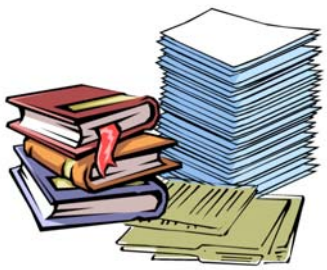


Start by looking at the existing intangible assets, including processes, structure, communities and people.

Analyse the structure of your organisation. List all its elements starting from the Mayor down to the names of all the employees, councillors and partners.

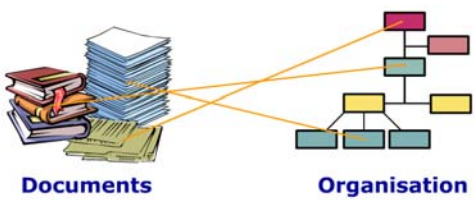
Assemble an audit team representing various organisational units. This team performs a preliminary assessment of knowledge assets to identify those that are both critical and weak.

2. List the documents



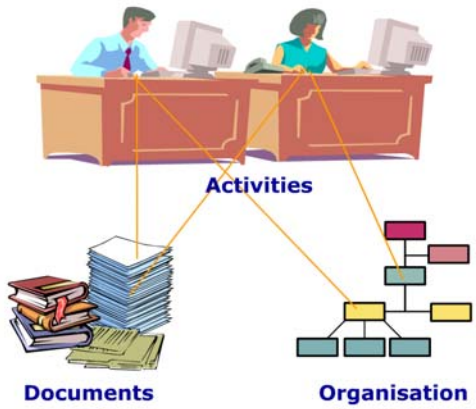
List all the documents and forms that are used at the local authority.

3. Link the elements and documents



Link the elements of the organisational structure, such as departments, official titles, and political positions to the documents.

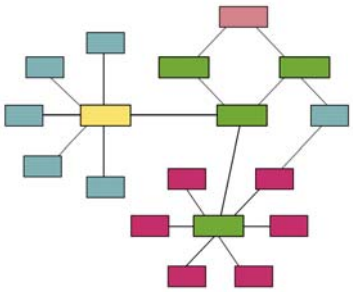
4. Link the activities



List the activities that the departments are responsible for. These activities correspond to the services that the local authority provides for their citizens.

Link these activities to the organisational structure and the documents.

5. Build an ontology



Build a knowledge model, or an ontology, on the basis of the knowledge analysis.

The use of an ontology enables the local authority to define concepts and relationships representing knowledge about particular documents in domain specific terms. This is done by creating links between the documents and the relevant parts of the domain model.

KM analysis requires thorough knowledge of the KM development software tool.

1.1.4 Step 4: Design e-Government architecture

Select the infrastructural components that constitute your e-Government architecture. Integrating these components to create a knowledge-based e-Government system model requires thinking in terms of an infostructure rather than an infrastructure. These are the issues you should decide on:

- Comprehend the various components of the knowledge infrastructure.
- Decide on the collaborative platform.
- Identify internal and external information and knowledge sources that must be integrated.
- Balance cost against each value-adding function for each enabling component.
- Create profiling mechanisms for knowledge delivery.

1.1.5 Step 5: Design a KM team

Design a knowledge management team that will design, build, implement, and deploy the knowledge-based e-Government system in your organisation.

- Identify a few key stakeholders within and outside your organisation, including management, IT, citizens, local authority employees, and representatives of professional organisational groups. The KM team is not a static one; it must address the continually changing external and internal environment.

- Identify sources of expertise that are needed to successfully design, build, and deploy the system. Contact the representatives of all the departments that will use the KM system. Managerial representatives with a sufficient knowledge of the organisation and an understanding of the big picture provide the strategic direction for the project.
- Select a visionary and experienced project leader who helps members of the team understand the project's mission and align their efforts with the organisation's overall goals and objectives.
- Balance the team's constitution organisationally, strategically, and technologically. KM is not solely a technical project, so the project team needs to balance managerial and technical participants.
- Identify critical failure points. The high-risk areas for KM projects are end-user and management support. It is therefore crucial to involve representatives of both of these stakeholder groups to minimise problems in the later stages.

Who should be a member in a knowledge management team?

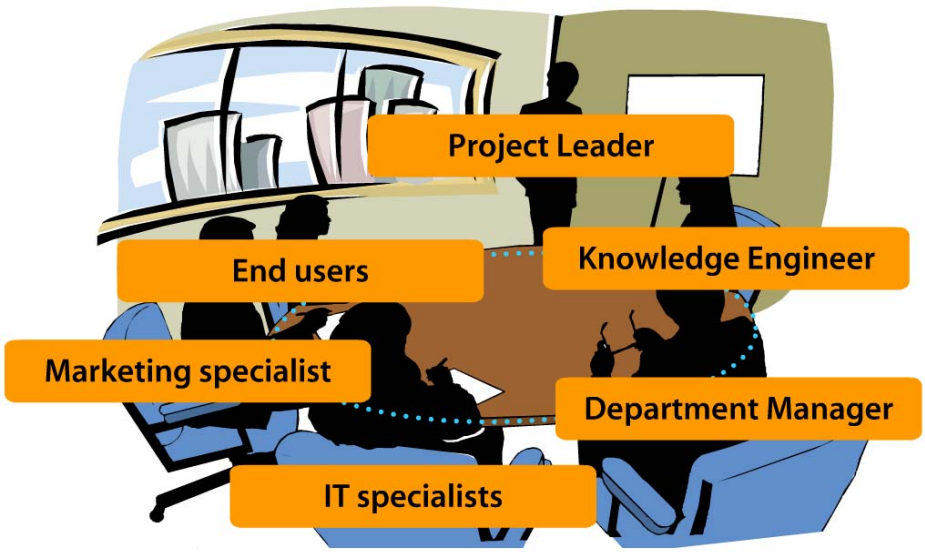


Figure 2: Members of KM team.

Project Leader

A KM project needs an experienced project leader who takes charge of the conventional project management, scheduling and coordination duties. The project leader must have direct reporting capabilities to upper management, have experience of both complex projects and various roles within the organisation and know how to facilitate, consult and resolve conflicts.

Department Manager

Yes, the Department Manager must be a member of the KM team because he/she sets up policies and responsibilities for the departmental agenda by means of KM system support, in-

cluding changes in the business processes. An administrative assistant may also be necessary.

Knowledge Engineer

Yes, a Knowledge Engineer is the most important expert member of the team. A KE is an IT specialist with experience in knowledge modelling or expert systems design and development. He/she is usually hired for a defined period of time and is responsible for the design and deployment of the knowledge model. A Knowledge Engineer is typically a startup team member.

IT specialists

Yes, the KM team must include IT specialists who specify how a KM system should be built for the organisation. An Information Architect takes responsibility for the knowledge model maintenance after the startup period, replacing the knowledge engineer. A System Administrator takes care of the continual functioning of the system, management of users, setting up of log files and so on. Other IT specialists can be included as needed.

Marketing specialist

Yes, a marketing specialist is needed to do the public relations and to disseminate the KM system mainly outside the organisation towards citizens, businesses and other user groups.

End users

Yes, end users definitely need their representatives in a KM team to ensure that the planned e-Government system fulfils their needs and requirements. End users are local authority employees and citizens.

(Mayor)

The Mayor is not necessarily a KM team member. The Mayor presides at council meetings and represents the local authority, but is not the kind of expert member that a KM team needs.

(Controller)

The Controller is not necessarily needed in a KM team because financial considerations are not discussed at this phase. But if the KM project is about the Financial Department, the Controller would be a member of the team.

Summary

The KM team members must come from different functional areas and departments of the organisation. All groups that will be affected by the KM project and that are expected to use and contribute to the knowledge and KM efforts must be adequately represented in the team. The team members should have:

- specialised expertise
- sufficient experience of the organisation
- the required competencies that truly represent the concerns of their department
- they should believe in the project and have a clear vision of what improved knowledge flows can and should do for their department

1.1.6 Step 6: Develop the e-Government system

First create a blueprint that provides a plan for building and incrementally improving the knowledge-based e-Government system.

- Customise a generic e-Government architecture to your organisation and to the services you provide.
- Select the components required by your organisation: content centres, discussion forums, data and text mining tools, information retrieval tools, user interface options, and so on.
- Analyse the requirements of the user interface.
- Design the system for interoperability with existing IT investments.
- Make the build-or-buy decision and understand the trade-offs.

Develop and implement a working system on the basis of the blueprint.

1.1.7 Step 7: Pilot test and deploy the system

A successful e-Government project must take into account the actual needs of its users. Although a cross-functional KM team can help identify many of these needs, a pilot test is the ultimate reality check.

Here are issues that you need to consider:

- Understand the need for a pilot deployment and evaluate the need to run one. Select the right, representative pilot project.
- Identify and isolate failure points.
- Understand the knowledge management life cycle and its implications for system deployment.
- Understand the scope of the system deployment.
- Use the results-driven incremental (RDI) methodology to deploy the system.

1.1.8 Step 8: Reward structures and change management

Encourage employees to use the new system and try to gain their support for it. Introduce new reward structures that motivate employees to use the system and contribute to its infusion. Provide the necessary training.

Many organisations make the seriously erroneous assumption that the intrinsic value of an innovation such as a KM-based e-Government system will automatically lead to its enthusiastic adoption by their employees. This is usually not the case. Above all, it requires enthusiastic leadership that sets an example to follow and helps sell the idea internally.

Manage and implement cultural and process changes to make the KM-based e-Government system a success.

What do you think would be effective ways of getting employees to adopt the new system?

Figure 3: Motivating Employees.

Involve Employees Early on in the Project

This is a very effective approach. The more the employees understand about the new system and their new tasks, the more readily they adopt it.

Select an e-Government Evangelist

Selecting a strong spokesperson is important for the success of the whole project. At lower levels, involving the leaders of units at the early stages of the e-Government project guarantees employees' interest and participation.

Provide Training

Training is an excellent way of motivating people and changing their attitudes. Adequate training should be provided well in advance befre the new system is launched.

Solicit Feedback from Employees

This is highly recommended! By soliciting feedback from employees you keep them engaged and involved and ensure continous development of the system.

Reward Excellent Performance

Rewarding and praise are highly motivating. Rewards can come in the form of professional advancement or financial benefit. Praise those who adapt to the system well.

1.1.9 Step 9: Measure the impact

The impact of the e-Government system should be measured somehow, taking into account its financial as well as organisational impact, such as

effectiveness, quality, accessibility of services and satisfaction of end users.

- Select an appropriate set of metrics.
- Calculate return-on-investment (ROI) for the project.
- Decide when to use benchmarking as comparative metrics.
- Use Quality Function Deployment for creating strategic metrics.
- Select the software tools for tracking complex metrics.

Being able to measure returns arms you with hard data that you can use to prove the impact of effective KM and to refine KM design through subsequent iterations.

2 Webocrat Project Plan

2.1 Introduction

The Webocrat Project Plan section describes the steps you should take when employing a knowledge management based Webocrat system in your organisation. This plan has been devised on the basis of pilot project experiences.

2.2 Project Plan

This section deals with the issues that you should take into consideration when planning a Webocrat project.

The project plan has been complemented with information gathered during the Webocrat Pilot Project.

2.2.1 Step 1: Define a goal

The goals for local e-Government initiatives are usually derived from the national strategy, information society policies and local needs.

An e-Government project should be started with a discussion on e-Government in general, its benefits, threats and associated issues. This initial discussion should be started by the local authority management personnel and it should be opened on several forums. Experience should be collected from other similar projects.

An external consultant may be a good discussion opener for those who are not familiar with the key concepts of e-Government.

Technological issues should not play a major role at the initial phase of the project. There is always a risk that technology-oriented discussion drives e-Government planning and requirement setting towards a direction where the system plays the key role and organisation, e-Government in general, people and processes are left at the background.

Technology itself is not the solution for e-Government; it only supports the democratic processes and people within the democracy.

Currently, organisations are investing heavily in e-Government software, hardware and infrastructure. This activity is driven by the government agendas which set targets for delivering electronic services, processes and information at all levels, from government departments, agencies, services providers to regional government and local government.

So far, many local authorities have not seen IT and delivering e-services as a priority. Because of this, much of the infrastructure and hardware is outdated and will not meet modern demands. A public debate is therefore necessary to make the citizens aware of the scale of this work and spending currently being undertaken.

Pilot experiences

The local authority and its partners had done little to exploit the Internet and felt that a low-cost, accessible and undiscriminating medium should be examined alongside traditional methods (such as paper-based and face-to-face) to see if the Internet could enhance areas of existing local authority activity. Cost savings and value for money were also factors considered.

After discussions and interviews the local authority decided to implement a flexible and easy-to-use system that will:

- provide citizens with easier access to information at the local authority and information about the elected representatives
- offer more channels of communication with the local authority and the elected representatives
- enhance communication among people, organisations, businesses, interest groups, local authority and elected representatives within the municipality as well as outside it
- be cost-efficient

2.2.2 Step 2: Define a Strategy

Define the general requirements for e-Government, budget, available resources and so on. A detailed requirement specification cannot be made without a comprehensive analysis of processes, information and users. However, a general requirement specification is needed since it outlines the scope of e-Government and also the scope of the analysis phase.

Although most of the typical e-Government objectives are quality-labeled, such as better communication between citizens and local authorities and improved understanding of democratic processes, it is important to define the objectives explicitly. If the objectives are loosely defined, you cannot measure how well they were reached or which targets were achieved and which failed.

Pilot experiences

The project team used a number of criteria to decide what kind of online services should be provided:

- **Coverage**: How many people would the service involve?
- **Topics**: What topics would be offered? Are they emotive topics?
- **Content**: Is there enough information (currently or over time) to support a web site?
- **Partners**: Who are the partners 'sponsoring' the service ? Are they important?
- **Interaction**: What is the potential in the service to utilise electronic communication methods?
- **Adoption**: Do partners, elected representatives, LA employees and citizens have the skills, equipment, access and confidence to take part in the online service?
- **Resource**: How much resource would be required to create and maintain the site content?

The local authority decided to publish information and forms, to poll opinions and to carry out a number of consultations about issues that concern citizens.

The topics and issues were selected on the basis of their interest to the users. Various public surveys were a good source of information.

The local authority decided to publish as many online forms as possible. Only those submission forms that did not need an electronic signature, legal documents from various agencies as attachments, or fees to be collected were selected.

The consultations were selected on the basis of coverage, that is, they had to cover a large number of households. It was also felt that the consultations should be complimented by the electronic methods available, not created for the sake of being able to conduct an electronic consultation.

2.2.3 Step 3: Define a scope

Setting a scope is directly related to the objectives and requirements, so when defining the goals of Webocrat employment you actually include information, people, processes and technology in the project.

For example, if the goal is to get more citizen input into decision making, the Webocrat system, or part of it, should help the local authority achieve this goal. The scope of the project is the sum of all these objective and requirement definitions.

The scope of the Webocrat employment project also defines the scope of the analysis. For example, to be able to say whether communication has improved, the LA needs to analyse the current level of communication, set metrics for it and afterwards measure and analyse the communication again. Only then do they know if anything has changed.

Pilot experiences

This is how the project team identified the user groups and decided on the content:

The most important user groups were specified using two different methods: focus group method (the group consisting of department managers and citizens) and individual interviews with employees and citizens.

The main users were:

- 22,000 citizens
- 200 small or larger businesses
- 40 employees of the local authority
- 33 councillors
- I administrator

Other users included: everyone on the Internet, 600 dog owners, 9000 real-estate owners and 5000 students.

The content of the online services was specified based on feedback from the citizens, suggestions from the staff, demand from the councillors, other similar web pages, as well as surveys and polls conducted among the staff and the citizens.

The content for the web site was specified so that it should compliment the themes of consultation and bring about informed discussion participation with the hope of improving its quality and transparency. Complimentary content took the form of reports, web links and downloadable documents.

The following types of services were provided:

- online forms
- information publishing
- information search based on KM
- online consultations
- discussions
- public polls
- entertainment
- municipal news
- marketing (publishing information about businesses and organisations within the local authority)

2.2.4 Step 4: Define a schedule

Creating a Knowledge Model is a substantial task and requires some sort of business mapping and process analysis. Normally this work takes several months.

For large organisations that have many undefined relationships to other public organisations within and outside the local authority and that have very few people who understand the entire roles, responsibilities and relationships within the authority, this might take as much as 6 months to build. Therefore it is advisable to start small and do the work in parts.

Collecting the necessary information from all departments can take several days and requires cooperation with council officers who do not always have the time, are not always willing to cooperate, or do not themselves know. Analysing the collected data can also take several days.

Once the Knowledge Model has been created, setting Webocrat up is a relatively simple task.

Based on the experiences of the pilot project, this schedule can be suggested for smaller organisations:

- 2 to 4 weeks for building KM with the software tool
- 1 month for publishing the necessary documents
- 2 months for organising, consulting, managing, training, and marketing

After this, the system is sufficiently operational but it will take months before everything runs smoothly.

The administrator who has the main responsibility for Webocrat should have 1 - 2 days' special training.

The rest of the staff who only use a specific part of the system (for example, answer submissions), should have at least 1 day's training. It should be followed by on-the-job sessions held by the administrator. The administrator shows, for example, how documents are published and submissions are answered.

2.2.5 Step 5: Analyse and plan

Analyse the current situation, services and resources of your organisation and make a detailed plan for Webocrat employment. These analyses are usually performed by an Information Architect and should be based on general business modelling, that is, the general e-Government target setting, user requirements, information society policy programme and any other driving or defining forces.

The more time you use on analysing your organisation, the less time you need to spend later on correcting issues that never got analysed. The ratio between analysis and planning work and development and planning work should be as radical as 90:10. Experience has shown that the success of the project is usually prepared during analysis and planning.

See the next section for an example of how the planning of a consultation starts.

Pilot experiences

Consultation forms a major part of policy and decision-making within the local authority. Consultation is communication between citizens, administrators and, sometimes, elected representatives in formulating policy or activities. Webocrat seemed to fit nicely within this definition.

The Webocrat administrator analysed the processes, competencies and target groups in consultation with the partners,

the department managers and the Mayor. The available options were considered under the following criteria:

- **Interaction**: Where and when does LA communicate with its citizens?
- **Process**: What are the information flows like between the LA and its citizens? Is it weighted differently, that is, mostly outward communication from the LA with little input from citizens, or large inputs from citizens with relatively low communication from the LA ?
- **Specialism**: Are there areas of the communication channel which require specialist knowledge, such as social services and planning?
- **Influence**: Could the communication process owners be persuaded to use Webocrat in addition to their normal channels?
- **Skills**: What skills are required to service such communication channels? What skills do the project staff require to support its inclusion in the Webocrat project? What would be required?
- **Support**: Would the use of Webocrat software be accepted by staff and championed by Managers? Would the software be looked upon positively or negatively?
- **Improvement**: Would Webocrat offer an improvement to the activity or process undertaken?

On the basis of these criteria, the project team selected a number of consultations on issues that were defined as priorities in LA's Community Plan and that matched closely with the shared priorities agreed nationally.

The issues included safety, the environment, health, local economy and business, learning, communities and neighbourhoods, and caring.

For example, one of the consultations was about the future of Council housing. The citizens were asked whether Council housing should be managed by the Council, housing associations, private organisations or groups consisting of councillors, tenants and independents.

2.2.6 Step 6: Select a team

Start by specifying what experience and roles are required from the LA staff, do a competence analysis and define the role of external partners.

Designate a preliminary employment team. As the project progresses, the team line-up usually changes, especially after the analysis and planning phase, where the organisation, resources and processes are analysed. However, some of the team members must be permanent to ensure a successful outcome.

The employment team is normally selected by the Webocrat administrator, who works in cooperation with the LA staff.

The amount of work depends on the size of the organisation, amount of information to be published, the number of resources, and so on. The more people are involved in Webocrat employment, the faster the implementation and the better the web site.

Pilot experiences

No competence analysis was made in the pilot project. The team was selected by the Webocrat Administrator based on his knowledge of the LA staff.

The Webocrat employment team had the following members:

- a Webocrat Administrator
- a couple of Webocrat employees
- a computer network administrator

In addition to these, the team occasionally relied on the expertise of other members of the LA staff.

The team cooperated with the local schools, which participated in the marketing activities. Another external partner provided the first prize for the competition that was arranged to attract users to the new services.

The team felt that cooperation with the external partners worked well but that more partners would have been needed.

2.2.7 Step 7: Implement the system

Even though the e-Government software is mature and sophisticated, it has to live in different environments, which means that it has to be developed for each particular environment. For example, when Webocrat is implemented in an organisation that already has a comprehensive IT infrastructure supporting online services, it needs to be developed for the existing infrastructure.

Pilot experiences

The local authority implemented the following modules:

- **Discussion Forum** (DF) to enable users to contribute to discussions they are interested in.
- **Opinion Polling Room** (OPR) for polling about citizens' satisfaction with provided services.
- **Web Content Management** (WCM) module for publishing and submitting documents and linking them to concepts of the Knowledge Model.
- **Citizens' Information Helpdesk** (CIH) for searching published documents using keywords and content.
- **Electronic Submissions** for citizens' formal and informal contribution to the local authority.

- **Reporter** (REP) module for notifying users about newly published documents and for creating personal newsletters.

The following ontology was created:

- Local Authority (with links to Departments)
- Local council (with links to Deputy Mayor, Commissions, Meetings, Supervisor, Invitation, Local Board, Councillors)
- Legislation
- Activities (One-time social allowance, Building permit, Real estate acquirement, Reservation of a parking lot, Surname change, Residence registration)
- Discussions about local politics, concerns of the citizens and services provided by the local authority
- Consultations about selected issues
- Polls about the local paper, Webocrat and what changes citizens would like the local authority to make.

2.2.8 Step 8: Pilot test the system

Run the usual software tests to test the Webocrat functionality. Design a basic functionality checklist that answers the following questions: can you publish an article, can you relate resources to the ontology, does the search facility retrieve the relevant results, and so on.

After the functionality testing, run Webocrat, feed the data in, attract people to use it and collect information for evaluation, for example by using log files. After analysing the results, do the required adjustments, changes and corrections.

2.2.9 Step 9: Promote and Market

Marketing efforts should start right in the beginning and continue throughout the whole project.

Internal marketing efforts are necessary to sell the idea to the leaders of the local authority. For example, you may have to apply for external funding and other resources and usually this requires idea marketing. Internal briefings are a good tool to keep managerial staff up to date with the progress of the project, show that the council is working in partnership with other agencies and is prepared to be involved in innovative schemes.

Creating awareness among the public and attracting users requires continuous work. The results of the project very much depend on the time and money invested in marketing the system to the public. Without effective marketing efforts the overall impact and awareness amongst the population will be limited. The marketing approach should be simple and should not focus on the technology. Citizens want to know what Webocrat will do for them and how it could make their lives better.

Use any marketing tools that will bring people to use Webocrat: leaflets, posters, flyers, newspaper articles, radio and TV, public Internet access centres, partner web sites, other web sites and e-zines, web cams, games, competitions...

Pilot experiences

The project team found that internal briefings with the LA staff provided very important information. The department managers served for brainstorming and as a focus group. The briefings mobilised them into doing more for the project and made them more cooperative and supportive.

The following promotion tools were used to attract users among citizens: advertisements on local TV stations, radio stations and newspapers, official web pages, leaflets, and competitions and games on Webocrat.

When the effect of promotion was analysed, the project team noticed that all formal requests from the public were submitted immediately after an advertisement or a promotion campaign. Almost all of them stopped once the marketing stopped.

The project team did most of the marketing on their own and found that they could have done with some real expertise to help them with a marketing plan. The Press Office and Marketing Department should have been involved.

2.2.10 Step 10: Measure the impact

Analyse the impact of Webocrat by examining the sources of information available to you: online questionnaires, web server log files, online submissions and by conducting interviews with employees. You can use qualitative evaluation criteria, such as users' satisfaction with the provided services or quantitative evaluation criteria, such as the number of active users, number of submissions and average submission processing time.

Pilot experiences

The most useful feedback was received through the Discussion Forum, Opinion Polling Room, and informal submissions from the citizens and through surveys and interviews conducted among the staff. The quantitative evaluation criteria indicated the number of users, postings and pollings, the peak hours, which access points were used and the rate at which usage increased.

The collected information was analysed and changes based on it were made to the Webocrat system.

In some cases the pilot had immediate effects on government. Complaints that were directed to certain departments were now visible to management and the rest of the staff and actions could be taken to improve the service. Since informal requests are public, there is a greater pressure from the public and the councillors on the management to work harder.

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