eGovernment Monitor (eGovMon)

Project proposal for the BIP project under the VERDIKT programme

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Project Summary:
A massive digitalisation of public services is under way. The main challenge in this development is to ensure that the new online services effectively address the real needs of the citizens, businesses and governmental agencies. The Norwegian Ministry of Government Administration and Reform published recently a white paper called *An Information Society for All*,[1] which paves the way for an exciting new policy for public online services, based on open standards and universal design. A system to monitor this development is needed to better understand this field and to provide a better understanding of how to build good online service for the citizens and enterprises.
The proposed project will build on the successful EIAO[2] project and develop a demonstrator of an online monitor for benchmarking eGovernment performance in four areas:

- **A**ccessibility
- **T**ransparency
- **E**fficiency
- **I**mpact

A coherent assessment methodology with a set of specific indicators within each area will be developed. The indicators will be based on the state of the art, IT policies, and data gathered through workshops with municipalities, counties and other governmental agencies. When possible, automated metrics will be developed; otherwise, online surveys and expert advice will be used. The results will be presented online in a way that supports flexible and customizable data views. An online simulation model will support eGovernment policy making and facilitating citizen participation.
The eGovMon project will provide a basis for a stable yet extensible eGovernment evaluation framework. All project results will be released under an open license; and all the software produced will be published as open source software. In that way, the project results will provide a sound basis for the implementation of the eGovMon demonstrator and further development.

PART 1: The research project

1. Objectives

The primary objective for the research project is **to develop a demonstrator of an online monitor for benchmarking accessibility, impact, efficiency and transparency of eGovernment** (see Figure 1).

The primary objective will be achieved by realizing the following sub-objectives:

1 Develop **a methodology for assessment** of accessibility, transparency, efficiency and impact of eGovernment. The methodology will include:
- 1.1 A set of explicit and well formulated **indicators** to assess **eGov**ernment **A**ccessibility, **T**ransparency, **E**fficiency, and **I**mpact (eGovATEI indicators).
- 1.2 A set of **metrics**, detailed evaluation procedures to measure each indicator.
- 1.3 A set of **formal models and methods to aggregate** the measurement results from a selection of the proposed eGovATEI indicators (incl. aggregation of the results from manual and automated checks).

[1] http://www.regjeringen.no/en/dep/fad/kampanjer/Eit-informasjonssamfunn-for-alle.html?id=445374
[2] European Internet Accessibility Observatory (EIAO, http://eiao.net/)

2 Develop a **simulation model** illustrating how the selected eGovATEI indicators are likely to impact the overall performance and evolution of eGovernment

3 Develop a demonstrator of **online eGovernment monitor** (eGovMon) service and community (see the outline of the www.egovmon.no content in Figure 1), consisting of:

- A web crawler, performing the evaluations of the selected automated metrics.
- A web user interface to present the eGovernment benchmarks based on the measurements of the selected eGovATEI indicators, automated and/or manual.
- A demonstrator guide-tool for scheduling more labour intensive, manual evaluations.
- A demonstrator simulation tool for eGovernment decision-support and policy making.
- An online survey tool for collecting data on selected eGovATEI indicators and evaluating the demonstrator.
- An online work forum for collaborative development of eGovATEI indicators.

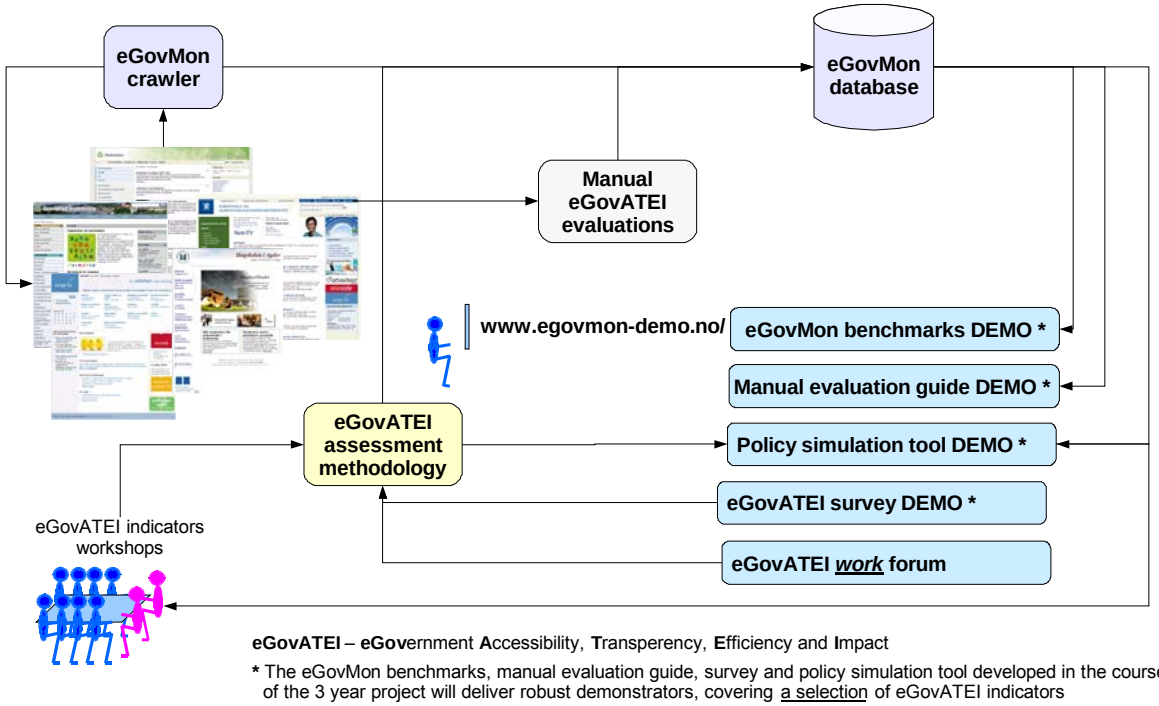

Figure 1 Outline of the online service, eGovMon, monitoring Accessibility, Transparency, Efficiency and Impact **(**ATEI**) of eGovernment**

2. Frontiers of knowledge and technology

Modern information societies necessitate digitalization of public services. The need for eGovernment is one of the key drivers in the European and many national IT policies. To ensure an appropriate progress in this area, implementation of eGovernment should be monitored, and better understood. There is now a plethora of eGovernment assessment initiatives: the UN[3] and the World Economic Forum[4] conduct annual global surveys of progress in adoption of IT, incl. advancement of IT-based public services. Annual international assessments are also carried out by Accenture.[5] In Europe, Capgemini[6] prepares the annual reports on eGovernment implementation in the Member States[7] for the European Commission. To provide online information about the eGovernment progress, the good

[3] http://www.unpan.org/egovernment5.asp
[4] http://www.weforum.org/en/initiatives/gcp/Global%20Information%20Technology%20Report/index.htm
[5] http://www.accenture.com/
[6] http://www.capgemini.com/
[7] Available at http://www.no.capgemini.com/resources/brosjyrer/online_availability_of_public_services__how_is_europe_progressing/

practice framework (http://www.egov-goodpractice.org/) and the eGovernment Observatory (http://ec.europa.eu/idabc/egovo) are now teaming up on one site for eGovernment Exchange (http://www.epractice.eu/). Also W3C explored recently how it may engage in building more robust eGovernment.[8] There are also a number of national evaluation efforts.[9] Still, despite the multiplicity of the assessments, comparisons and obtaining a clear understanding of the eGovernment implementation status is difficult.

Various assessments are conducted using different methodologies, often not described explicitly, and frequently modified. This makes the comparisons very difficult and the reported, compound indexes difficult to understand.[10] With an exception of some initiatives,[11] most assessment results are published only as document reports, preventing customized data analyses. They also are based primarily on the manual assessments,[12] making acquisition of the results expensive and time-consuming.

Also in Norway, there is no unified approach to measure the eGovernment status and progress. Multiple sources need to be consulted to obtain understanding of the eGovernment status:[13] Accessibility, usability and utility of eGovernment web sites is benchmarked annually by Norge.no. Further data on eGovernment advancement, use and utility are gathered through surveys commissioned by the Statistics Norway and other research institutes, and data on uptake of particular online services are reported by responsible government agencies.

While each of the evaluations provides a useful insight regarding a particular aspect of eGovernment, a unifying and transparent framework would be useful to facilitate data acquisition and ensure that the evaluation results deliver a coherent picture of the eGovernment development.

An example of such explicit evaluation framework is the Unified Web Evaluation Methodology (UWEM) developed by the EU-funded Web Accessibility Benchmarking (WAB) cluster. The EIAO team in Norway and FTB have been actively involved in this work through the European Internet Accessibility Observatory (EIAO) project. This expertise and experience will now be used to develop and implement a unified evaluation framework for assessing eGovernment. Web accessibility, which is the main focus of the UWEM, would be one of the aspects covered by the eGovMon framework. The other planned areas of assessment are transparency, efficiency and impact. An initial framework for evaluating transparency has been proposed recently by Berntzen (2006). Relevant indicators for efficiency and impact may include download time or the number of times the same information is requested from the user, and the number of uses of a given interactive service vs. the number of cases handled face-to-face, respectively. All the eGovMon indicators will be developed drawing on the Norwegian national IT plan (eNorge 2009,[14] see also Report No. 17 (2006 - 2007) to the Storting: *An Information Society for All*[15]) and other, already existing evaluation frameworks like, eGEP,[16] the measurement framework used by Capgemini,[17] etc.

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[8] See http://www.w3.org/2007/eGov/symposium-spain-report#follow-up

[9] For a review of several national initiatives see Snaprud & Sawicka, forthcoming.

[10] For a discussion of a selection of eGovernment evaluation methodologies see Berntzen, under review.

[11] See: http://www.unpan.org/egovkb, http://norge.no/kvalitet; http://webrichtlijnen.overheid.nl; see also http://demo.eiao.net (demo version)

[12] To the best of our knowledge, currently only the Dutch tool (http://webrichtlijnen.overheid.nl) and EIAO (to be launched in June 2007, see a demo version at http://demo.eiao.net) conduct monthly large-scale automated assessments. However, these assessments focus on accessibility and compliance to web standards.

[13] See http://www.regjeringen.no/upload/kilde/fad/rap/2006/0003/ddd/pdfv/295711-underveisrapport_enorge_2009.pdf (note that the report covers also IT-policy aspects beyond eGovernment)

[14] Available at: http://www.regjeringen.no/nb/dep/fad/Tema/IT-politikk__eNorge/eNorge-2009.html?id=439499

[15] Available at: http://www.e-norway.no/en/dep/fad/Documents/Government-propositions-and-reports-/Reports-to-the-Storting-white-papers/20062007/Report-No-17-2006---2007-to-the-Storting.html?id=441497

[16] Available at: http://82.187.13.175/eGEP/Static/E_Interim.asp?ST=0&page=1

An effort will be made to implement automated assessment procedures for as many of the indicators as possible. The automatable UWEM indicators implemented by the EIAO project will be the starting point. The eGovMon project, however, will also cover indicators that require manual and semi-manual assessment, developing new methods for combining these results with the results of automated evaluations.

3. R&D challenges

The proposed project sets out to define and implement a coherent eGovernment evaluation methodology, comprising of a set of explicit indicators and an online tool for disseminating the evaluation results. Three research areas may be identified:

1. **eGovernment assessment methodology**: A coherent assessment methodology comprising of a set of explicit indicators and the associated evaluation and aggregation procedures defined (see sub-objective 1, p. 1). Each indicator will be fully operationalized, i.e. a detailed and explicit definition will be provided, ensuring robustness and the ease of use. Where feasible, the indicators definitions will be enhanced by automated tests. Methods for aggregating the results of automated and manual evaluations will be developed. The entire methodology will be published under an open license to support its maintenance and further enhancement.
   To the best of our knowledge, no such eGovernment assessment methodology is currently available. The framework developed by the eGovernment Economics Project (eGEP) proposes a set of eGovernment indicators on efficiency, democracy, and effectiveness.[18] However, the indicators are meant only as a generic guidance for development of detailed indicators by individual countries. The UWEM, developed by the WAB cluster, with participation of the EIAO team, is more detailed and explicit; however, it concerns only web accessibility.[19]
2. **Online eGovernment monitor**: A demonstrator eGovMon web site providing access to the evaluation results will be developed. It will provide frequent (monthly) reports on the status of the selected automatable indicators, and periodic (annual) updates on the selected indicators that require manual assessments. To illustrate the proposed functionality, a sample of automated measurements will be accompanied by a list of recommended supplementary manual tests (see also Figure 1). The automated data will be gathered using the web crawler technology, developed in the EIAO project (see http://eiao.net).
   Much effort will be devoted to development of a usable and accessible interface for the eGovMon portal. Providing flexible access to data on various aspects and at different aggregation levels will require a well designed and thoroughly tested interface solution.
3. **eGovernment decision-support tool**: A demonstrator decision-support tool will be developed and implemented. The tool will be based on a model that allows simulation of various eGovernment scenarios and shows how the identified indicators impact the overall eGovernment performance. As the model will require explicit formulation of the indicator interdependencies, its development will support definition of indicators (see Figure 1).
   The use of simulation models has been rather limited in the area of eGovernment policy design (see e.g. Martinez-Moyano & Gil-Garcia, 2004; Martinez-Moyano, 2006). Still, the models are known not only to facilitate investigations of the effect a particular policy intervention may have on the overall, long-term system performance (see e.g. Sterman, 2000), but also to support effectively discussions among the stakeholders (see e.g., Vennix, 1996; Andersen & Richardson, 1997). As such they are likely to provide a valuable contribution to the online eGovernment monitor as well as to the workshops.

Each research area is planned to be developed into a doctoral research project.

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[17] See e.g. http://www.no.capgemini.com/resources/brosjyrer/online_availability_of_public_services__how_is_europe_progressing

[18] See: http://82.187.13.175/eGEP/Static/E_Interim.asp?ST=0&page=1

[19] See http://www.wabcluster.org/uwem/

4. Research approach/methods

Table 1 outlines the research approach and methods to be employed to reach the project's objectives (see section 1). In addition, the planned publication volume is indicated. All papers will be published in the scholarly journals, such as *Government Information Quarterly*, *Journal of e-Government*, *International Journal of Electronic Government Research*, *Electronic Government*, *Journal of Information Technology & Politics*, or *Electronic Journal of e-Government*, and at the recognized international conferences, such as the International Conference on Electronic Government (EGOV), eGov track at HICSS (Hawaii International Conference on System Sciences), d.go (run by Digital Government), European Conference on e-Government (ECEG), International Conference on e-Government (ICEG), e-Challenges, and on the newly launched international T4P (Technology for Participation) conference (see http://t4p.no), organized by the EIAO team, NTNU and Agder University College and to be held annually in Norway.

Table 1 Research approach and methods employed in the project, with the associated scientific publication volume.

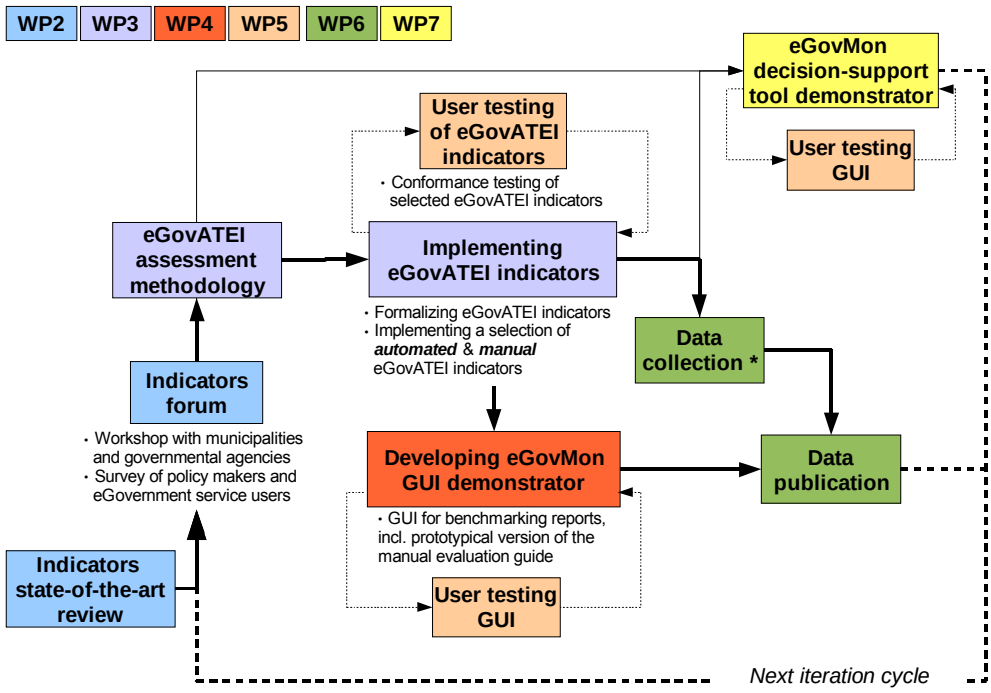
Project objective[20]	**Research approach & methods**	**Publication plan**
Define a set of eGovATEI indicators (sub-objective 1.1, p. 1)	• state-of-the-art review: what indicators and how are used in practice[21] • literature review: what is the state of the research regarding eGovernment indicators[22]	2 papers
	• online surveys	2 papers *
	• workshops (incl. group-model building sessions with simulation models)	2 papers *
Formal models and methods for aggregation of eGovATEI indicators (sub-objectives 1.2&1.3, p. 1)	• statistical methods for aggregating measurement data	2 papers *
	• component software engineering	1 papers
	• conformance tests for automated tests	2 papers *
Simulation models for eGovernment policy-making (sub-objective 2, p.2)	• system dynamics methodology [23]	2 papers *
	• group-model building [24]	2 papers *
Online eGovernment Monitor (sub-objective 3,p.2)	• web crawler and data web-mining	1 paper
	• GUI prototyping for benchmark reports	2 papers *
	• GUI expert usability, accessibility testing of the benchmark reports	
	• GUI user testing of the benchmark reports	2 papers *
	• GUI prototyping for decision-support tool	2 papers *
	• GUI expert usability, accessibility testing of the decision support tool	
	• GUI user testing of the decision support tool	2 papers *
	• Statistical data quality assurance methods[25]	2 papers *

* Each paper will report on the results of one of the project iterations, see section 7 for details.

[20] See section 1 for detailed definition of the objectives.
[21] Incl. review of indicators defined for the eNorge 2009 plan, indicators used by Norge.no, EIAO, other national benchmarking efforts (for a review of a selection see Snaprud & Sawicka, forthcoming), KOSTRA reporting system, CapGemini, etc.
[22] Incl. review of the eGEP framework, eGovernment maturity, assessment and evaluation models
[23] See Forrester, 1961; Sterman, 2000
[24] See Vennix, 1996; Andersen & Richardson, 1997; Andersen, Richardson, & Vennix, 1997
[25] See Nietzio, Ulltveit-Moe, Gjøsæter, Goodwin Olsen, & Snaprud, 2007

5. Project organisation and management

Development of a robust and comprehensive assessment methodology requires an iterative approach.[26] In the scope of this project, 2 iteration cycles are planned, each consisting of eight steps as outlined in Figure 2.



** Sample data will be collected both on automated and manual indicators. The manual collections will be less frequent.*

Figure 2 Overview of the main tasks in each iteration cycle of the eGovMon development

Table 2 (p. 9) presents a list of all project partners and the reference group members, indicating their expected contributions and areas of expertise.

For the projects' results to be useful, it is essential that those who develop and implement eGovernment, and those who measure and evaluate it, are actively involved. The group of municipalities/counties along with KS and Norge.no will constitute the key 'customers' for the project and will be actively involved in definition of the indicators and the evaluative methodology (WP2), eGovMon online reporting system (GUI, WP4) and the decision-support tool (WP7), see also Figure 2. PT, Statskonsult, Deltasenteret along with Capgemini and FTB, as organisations concerned with development or/and evaluation of eGovernment solutions, will also contribute to these activities. Furthermore, Capgemini and FTB will contribute with expertise regarding definition of indicators and development of evaluation methodologies to WP3: eGovATEI assessment methodology. Finally, FTB, drawing on its expertise from development of the EIAO, will contribute to data collection and quality assurance processes (WP6).

Development of robust eGovMon evaluation framework and the associated tools will be further supported by the involvement of reference group partners. In Norway, the Norwegian the Ministry of Government Administration and Reform as a very advanced user will participate in shaping the form of the evaluation results so that they can really be used to monitor the effect of national ICT policies on public web sites.[27] The Statistics Norway will support the work by contributing to the development of the indicators and online surveys.[28] the UN and Civic Resource Group (see also section 6).

[26] Such iterative approach has proved highly effective both in the EIAO project and the WAB cluster (http://wabcluster.org) working on the Unified Web Evaluation Methodology (UWEM, see http://www.wabcluster.org/uwem1).
[27] Statement of interest from the Ministry accompanies the application.
[28] Statement of interest from the Statistics Norway accompanies the application.

The core project team is already established based on the EIAO project at Agder University College. The team, led by Dr Mikael Snaprud (Tingtun AS and Agder University College), has been responsible for development and implementation of automated accessibility metrics into an online Observatory in the frame of the EIAO project.[29] A continuation of this team will secure both effective exploitation of the research results from the EIAO project and the continuation of one of the most successful research teams formed in a Norwegian university college. The team has managed to compete successfully with the and get the highest ranked project proposal in the targeted FP6 call. In addition the team has performed extraordinarily well with no significant project delays and effort spending well within the project budget.

The eGovMon will be coordinated by Tingtun AS and led jointly by Dr Agata Sawicka (Agder University College) and Dr Snaprud, who both have experience in initiating and directing research. Dr Snaprud is currently leading the EIAO project with 10 initiating partners. In addition to the EIAO related research activities, Dr Sawicka is conducting a post-doctoral research focused on identifying effective ways of communication of the system dynamics decision-support simulation models, and Dr Snaprud has a substantial expertise with regard to open source software, open standards, open content and the related IPR issues. In the eGovMon project, AUC will be joined by In the eGovMon project, the EIAO team will be joint by 5 other research centres: Dr Lasse Berntzen (VUC) will contribute with expertise within the area of eGovernment evaluation frameworks, eTransparency and eDemocracy; Prof. Christian Jensen (AAU) with expertise in data warehousing and mining; Prof. Kim Viborg Andersen (CBS) with expertise in eParticipation and eGovernment services; Prof. Cristiano Codagnone (MIP) with experience from the eGEP project and extensive expertise in eGovernment evaluation frameworks; FTB with experience from the EIAO project and expertise in development of formal metrics.

6. International cooperation

The topic of the eGovMon proposal is international in nature and the consortium is therefore composed of some of the most leading organisations in this field. Two research organizations and 3 foreign universities will partner in the eGovMon project, as described in section 5. In addition, building on the partnership established for the eGovernment Indicators Research pilot project (funded under the RCN's FIFOS programme, project no. 179506/I40), the United Nations and Civic Resource Group (http://www.civicresource.com/index.htm) will be involved as reference groups, contributing with expertise and experience from their work on the UN annual eReadiness global report (http://www.unpan.org/egovkb/global_reports/index.htm). The project will further benefit from the international Network of Excellence, DEMO-net (http://www.demo-net.org), where Prof. Kim Viborg Andersen (CBS) is appointed the role of the scientific coordinator.

7. Progress plan – milestones

The progress plan with most important milestones is outlined in Figure 3. Drawing on the successful experience of the EIAO project plan, the eGovMon project will be organized to be carried out in 2 iterations covering same activities with 1st iteration: Q1'08-Q2'09, and 2nd iteration: Q3'09-Q4'10.

[29] Two of the team members are proposed as PhD-candidates for the eGovMon project. The third PhD-candidate comes from the EIAO partner organization, FTB.

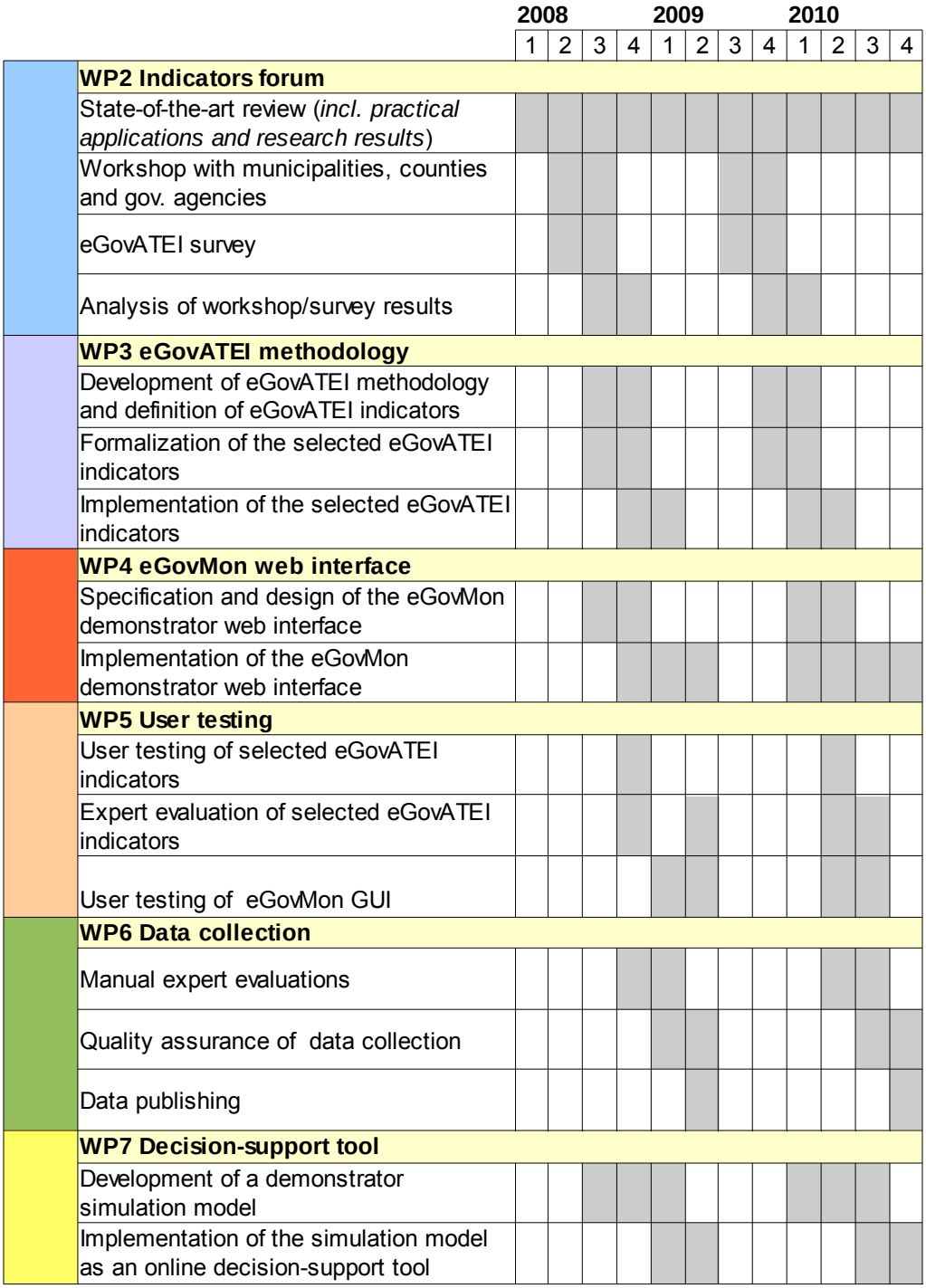


Figure 3 Overview of the project milestones

Table 2 eGovMon project partners and reference group, their expertise and role in the project
Columns showing contributions of the reference group members are greyed.

	TT	**KS**	**MUNI**	**NORGE**	**PT**	**STAT**	**DELTA**	**VUC**	**AAU**	**CBS**	**MIP**	**FTB**	**CG**	*FAD*	*SSB*	*UN*	*CRG*
WP1 Project management	x																
WP2 Indicators forum	x	x	x	x	x	x	x	x		x	x	x	x	*x*	x	*x*	*x*
WP3 eGovATEI methodology	x			x		x		x	x	x	x	x	x	*x*	x	*x*	*x*
WP4 eGovMon web interface	x	x	x	x	x	x	x	x		x	x	x	x	*x*	x	*x*	*x*
WP5 User testing	x	x	x	x	x	x	x	x		x	x		x		x		
WP6 Data collection	x			x					x			x			x		
WP7 Decision-support tool	x	x	x	x	x	x	x	x		x	x		x	*x*	x	*x*	*x*
WP8 Dissemination & exploitation	x	x	x	x	x	x	x	x	x	x	x	x	x	*x*	x	*x*	*x*

eGovMon project partners:
TT – Tingtun AS; **KS** – Kommune Setnralforbundet (The Norwegian Association of Local and Regional Authorities); **MUNI** – a group partner of min. 15 Norwegian municipalities and counties; **NORGE** – Norge.no; **PT** – Post- og Teletilsynet; **STAT** – Statskonsult; **DELTA** – Deltasenteret; **VUC** – Vestfold University College; **AAU** – Aalborg University; **CBS** – Copenhagen Business School; **MIP** – School of Business of Politecnico di Milano; **FTB** - Forschungsinstitut Technologie und Behinderung (FTB) of Evangelische Stiftung Volmarstein; **CG** - Capgemini

eGovMon project reference group members:
FAD - Fornyings- og administrasjonsdepartementet (Ministry of Government Administration and Reform); *SSB* - Statistisk Sentralbyrå (Statistics Norway); *UN* – United nations; *CFG* – Civic Resource Group

8. Costs incurred by each research-performing partner

An overview of how the project costs will be distributed among eGovMon partners is presented in Table 3.

Table 3 Distribution of project cotsts among the eGovMon partners.

		Payroll & indirect costs	*R&D services*	*Equipment*	*Other operating costs*	**Total**
1	TT	15.718.500		150.000	223.000	16.091.500
2	KS	756.000			30.000	786.000
3	MUNI	8.505.000			900.000	9.405.000
4	NORGE	1.134.000			30.000	1.164.000
5	PT	756.000			30.000	786.000
6	STAT	756.000			30.000	786.000
7	DELTA	378.000			30.000	408.000
8	VUC	1.134.000			30.000	1.164.000
9	AAU	756.000			30.000	786.000
10	CBS	378.000			30.000	408.000
11	MIP	378.000			30.000	408.000
12	FTB	378.000			30.000	408.000
13	CG	396.225			30.000	426.225
						33.026.725
					Rounded to 1.000	**33.027.000**

9. Financial contribution by partner

An overview of how the project partners will contribute to the eGovMon project is presented in Table 4.

Table 4 Overview of the eGovMon project partner contributions.

		Own contribution	*Monetary contribution*	**Total**
1	TT	756.000	0	
2	KS	756.000	0	
3	MUNI	9.405.000	0	
4	NORGE	1.164.000	0	
5	PT	786.000	0	
6	STAT	756.000	0	
7	DELTA	408.000	0	
8	VUC	378.000	0	
9	AAU	378.000	0	
10	CBS	378.000	0	
11	MIP	378.000	0	
12	FTB	378.000	0	
13	CG	396.225	0	
14	Other *	0	193.000	
15	RCN	0	16.516.500	
		16.317.225	16.709.500	33.026.725
			Rounded to 1.000	**33.027.000**

* Other indicates other sources of funding such as various Ministries, IT-Funk, Sørlandets Kompetansefondet, etc.

PART 2: Exploitation of results

10. Underlying idea

What gets measured, gets done – and gets attention.

To support the national IT policy and the needs of municipalities and governmental agencies, and to develop and improve existing eGovernment evaluation frameworks, the eGovMon project will deliver:

- a coherent methodology for eGovernment assessment, with a detailed, explicit, and open set of indicators to measure accessibility, impact, efficiency and transparency,
- a demonstrator of an online eGovernment benchmarking system, providing detailed and flexible data drills through the results of selected indicators, and
- a demonstrator for an online decision-support tool, illustrating the predicted impact of selected indicators on the eGovernment development.

The eGovMon results will bring about the value-creating renewal with respect to **the way the eGovernment services are evaluated**. Currently, there is no coherent framework for comprehensive monitoring and assessment of status or progress. Evaluation efforts are fragmented, carried out by a range of agencies (Norge.no, SSB, agencies responsible for providing the services), making it difficult to obtain an overall picture of the current eGovernment status and to plan for its future development. Furthermore, the evaluations are conducted by and large manually, resulting in a labour intensive and expensive process.
The proposed online eGovMon service will allow for frequent automated evaluation of some indicators. The set of explicit indicators and the associated evaluation methodology will support integration of automated evaluations with the results of (less frequent) manual assessments, delivering a comprehensive set of data on eGovernment status and progress over time. This data will be presented online and will, combined with the simulation-based decision-support tool, provide a unique and novel platform both for further research and for monitoring and management of eGovernment, helping to disseminate the lessons learned and thus improve the efficiency of new investments in eGovernment services.

11. Innovation/degree of novelty

The eGovMon project will bring about the following innovations:

1. The eGovMon unified, open and comprehensive **methodology** for manual and automatic assessment of eGovernment services will constitute a major innovation in the area of eGovernment evaluation. Existing frameworks are rather unstable, with frequent updates and modifications; moreover, they are rarely explicitly defined, making both the analytical work cumbersome and preventing a wider participation from governmental and local bodies as well as citizens in the development of indicators. Finally, they are largely based on manual assessments. The proposed methodology will develop both automatable and manual metrics.
2. The eGovMon online eGovernment **benchmarking service** will be a major innovation in the area of eGovernment evaluation and policy making. Most of the current eGovernment evaluation results are published as paper reports, making customized data analysis troublesome, if not impossible. Available online benchmarks have only limited data-mining capacity. The eGovMon service will support a range of customizable data mining features including aggregations at various levels and customizable queries.
3. The eGovMon online **eGovernment decision-support** tool will be a major innovation in the area of eGovernment strategy planning and policy making. Development of robust, effective and sustainable eGovernment services is a complex task, requiring consideration of multiple aspects. The proposed tool will help to understand how the selected eGovernment indicators may be influenced and what is their role in the overall eGovernment progress.
4. The eGovMon project, through a series of workshops, surveys and an online discussion forum, will engage the stakeholders and researchers in an active dialogue, promoting more **participatory design of eGovernment** and thereby improving the adoption and utility of the result.

12. Plan for exploitation of research results in the participating public sector organisations

The project has the following key public sector partner organizations – the Norwegian municipalities and counties (a group partner), KS, Norge.no, and SSB. Exploitation plans for each organization are outlined below:

Plan for exploitation of research results in the Norwegian municipalities and counties

NB: Note that although ca. 15 municipalities/counties will be directly involved in the project workshops, the project results will be relevant for **all** 431 Norwegian municipalities and 19 counties.

a) Business concept

In accordance with the eNorge 2009 plan, municipalities are responsible for digitalizing their interaction with citizens.[30] The proposed project will actively involve the municipalities/counties in elaboration of the eGovernment assessment indicators, and provide them with tools for monitoring and designing their eGovernment development policies.

b) Innovation/degree of novelty

The results of the proposed project will bring about major innovations with respect to the way municipalities and counties go about digitalization of their services.

The success of Norge.no's quality mark indicates that many municipalities use the evaluation results as a benchmark for planning further development of their online resources.[31] The eGovMon project will extend the number of eGovernment indicators measured, providing frequent reports on those that can be automated and giving the municipalities/counties more extensive and up-to-date information on their eGovernment progress. The municipalities/counties involved will be invited to participate in an online Wiki-based community where the project results will be discussed. In that way they will have a unique opportunity to engage actively in critical review of the used indicators and measurement methods. Finally, the project will provide the municipalities with a unique policy design support tool. Using the online simulation model, the municipalities/counties will be able to investigate in detail the likely impact of their planned eGovernment initiatives, as well as see how the particular indicators impact the eGovernment status and progress.

c) Economic value

- The eGovMon project will deliver a comprehensive, online benchmarking system and the associated decision-support tool – advanced tools for eGovernment monitoring and management.
- The results of eGovMon benchmarks and participation in the online community are likely to stimulate the municipalities/counties to development of more effective, higher quality online services, resulting in a more productive performance; the improvement should be surface over time in the eGovMon rankings.

The economic value of the project results will be monitored closely and reported in the project publications.

d) Plan for realization

The critical milestones requiring involvement of the municipalities/counties are: • Workshops on eGovernment indicators (Q3'08 and Q4'09), • User testing of the eGovMon reporting interface, Q1'09 and Q1'10, • Development of the simulation model (Q4'08 and Q2'10). The subsequent versions of the project results, incl. the prototypical eGovernment monitoring system, the eGovernment discussion forum and the policy-support simulation model, will be available in Q2'09 and Q4'10, respectively.

e) Risk factors

No significant risk factors have been identified.

Plan for exploitation of research results in KS

a) Business concept

KS is a national umbrella organization for the Norwegian municipalities and counties. It plays an advisory and consultative role and acts as a spokesman and advocate vis-à-vis central government on behalf of its members.[32] Through the proposed project, KS will be actively involved in definition of the eGovernment assessment framework. The project will produce tools that KS will

[30] See also eKommune 2009: http://www.ks-bedrift.no/upload/72194/eKommune%202009.pdf

[31] 52% of the tested organizations reported to work on web accessibility after the 1st ranking was released (see http://www.norge.no/kvalitet/).

[32] See also http://www.ks.no/templates/Page.aspx?id=36137

use to monitor progress of eGovernment implementation and to facilitate discussions on the eGovernment development policies and strategies at the municipal and county level.

b) Innovation/degree of novelty

Results of the eGovMon project will bring about major innovations with respect to the way KS has been conducting its eGovernment-related activities. Through the project workshops, surveys and the online wiki-work space, KS will get actively involved in definition of the eGovernment assessment framework. The resulting eGovMon benchmarks will enable KS to track closely the progress and status of eGovernment implementation. The online decision-support simulation tool will allow KS to investigate effectively various policies and strategies for further eGovernment development.

c) Economic value

- The eGovMon project will deliver a comprehensive, online benchmarking system and the associated decision-support tool – advanced tools for eGovernment monitoring and management. These tools will support KS' work in the area of eGovernment development, and especially its tasks as outlined in eKommune 2009 plan.
- The results of eGovMon project are likely to promote good eGovernment solutions, facilitating KS' work in the area of eGovernment implementation.

The economic value of the project results will be monitored closely and reported in the project publications.

d) Plan for realization

The critical milestones requiring involvement of KS are: • Workshops on eGovernment indicators (Q3'08 and Q4'09), • User testing of the eGovMon reporting interface, Q1'09 and Q1'10, • Development of the simulation model (Q4'08 and Q2'10). The subsequent versions of the project results, incl. the prototypical eGovernment monitoring system, the eGovernment discussion forum and the policy-support simulation model, will be available in Q2'09 and Q4'10, respectively.

e) Risk factors

No substantial risk factors have been identified.

Plan for exploitation of research results in Norge.no

a) Business concept

Norge.no is responsible for producing annual benchmarks of the governmental web sites' quality. The results of the proposed project will allow for more frequent and comprehensive benchmarks.

b) Innovation/degree of novelty

The results of the proposed project will bring about innovations with respect to the way Norge.no can gather and present the evaluation results:

Data collection: The evaluations carried out by Norge.no are now mainly performed manually. Implementation of the automated set of indicators will be a major innovation. The use of automated evaluation crawls for eGovernment benchmarking is innovative and novel also in the global context. To the best of our knowledge there exists no similar benchmarking service available elsewhere. Two similar services are promoted this year: the European Internet Accessibility Observatory, EIAO (to be launched in June 2007, see http://demo.eiao.net) and the Dutch monitor launched in February 2007 (http://www.advies.overheid.nl/continu). They both feature web accessibility and standards conformance, but neither delivers results on eGovernment efficiency, transparency or impact.

Data presentation: Currently, Norge.no, as other similar online benchmarking portals, generates only a few and relatively simple reports. The eGovMon project will develop novel and more advanced ways of online access to evaluation results, providing a wide range of predefined reports and extensive support for customized data searches. The developed search and reporting interface will constitute a major innovation for the Norge.no's portal. It will also be a major innovation in the context of the reporting interfaces used for reporting on the eGovernment evaluation results globally.

c) Economic value

- The automated metrics developed in eGovMon will reduce the costs of evaluations (currently carried out manually) and will allow Norge.no to provide an improved service by publishing some evaluation results more frequently.
- The comprehensive eGovATEI assessment methodology will provide specification of additional indicators that could be included in the Norge.no's surveys. Given that the methodology will be published under an open licence, Norge.no may extend its surveys' coverage at rather low costs.

The economic value of the project results will be monitored closely and reported in the project publications.

d) Plan for realization

Norge.no will be actively involved throughout the project duration (see Table 2). The critical milestones involve: • Definition of eGovernment indicators (Q2-4'08 and Q3'09-Q1'10) • User survey (Q2-3'08 and Q3-4'09) • Specification and design of the eGovMon GUI (Q3-4'08 and Q1-2'10, • Development of the decision-support tool, scheduled for (Q1-4'08 and Q4'09-Q3'10). The subsequent versions of the project results, incl. the prototypical eGovernment monitoring system, the eGovernment discussion forum and the policy-support simulation model, will be available in Q2'09 and Q4'10, respectively.

e) Risk factors

No significant risk factors have been identified.

13. Environmental impact

The eGovMon online service will promote eGovernment, stimulating digital rather than paper-based handling of cases at public and governmental agencies. We can expect better quality online services to reduce the amount of paper needed to carry out government transactions.

14. Other value

The openly accessible data from eGovMon can fuel eGovernment research in general. Reporting on the current status and progress of eGovernment, the eGovMon will provide a valuable input for the research of the groups involved in the project and other research centres. Obtained using an explicit and detailed methodology, the eGovMon results will allow precise tracking of the components of a particular score or an indicator. Published under an open licence, the methodology will invite contributions from others and is likely to stimulate new research developments in a more effective way. The decision-support demonstrator tool available online will allow for systematic simulation of various eGovernment development scenarios – an important and novel contribution to the eGovernment researchers' toolbox. Some of other key benefits of the eGovMon project's results are:

- **Support for development, implementation, measurement and evaluation of eGovernment**: Available freely online, the GovMon evaluation results and the decision-support tool may be used by all concerned with eGovernment.
- **National eGovernment case**: The eGovMon demonstrator implementation may be used as basis for national organisation of the use and development of eGovMon results. This national platform can serve as an example for similar initiatives in other countries, or on a European level.
- **Raised eGovernment awareness**: Follow up with press releases featuring the particularly good/bad solutions will create more awareness of the eGovernment quality issues.
- **Combating corruption**: The indicators for transparency could prove useful to combat corruption. In this way, eGovernment could also be a tool to increase the efficiency of development aid and reduce poverty in developing countries.
- **Reuse of open source software:** The software from the project can easily be reused in other projects for example as a component in developing aid projects.

- **Supporting the use of indicators in related fields**: While the eGovMon methodology will focus on indicators for eGovernment, some of these indicators may be used also in other fields and support studies of eDemocracy or eParticipation.[33]

15. Information and dissemination of results

The purpose of the eGovMon online service is to deliver a vehicle for effective and participatory eGovernment. It is therefore essential that the projects' results are disseminated both in the scholarly and public forums. Beyond a range of scholarly publications planned (see section 4 for more details), an effort will be made to ensure that the project's results are covered also by the popular media (incl. newspapers, web-portals, TV, and radio) and other dedicated dissemination channels such newsletters or discussion forums for relevant associations. Additionally, an eGovMon newsletter will be established and distributed to a wide range of public and governmental agencies and research groups. An extensive coverage will be provided annually in connection with the newly launched T4P conference,[34] organized by the EIAO team and AUC. This event will provide an important venue for broad national and international discussions and a featured publication of the project's results in the national media.

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[33] For an initial framework for studying e-presence of parliaments and political parties see e.g. Berntzen, Healy, Hahamis, Dunville, & Esteves, 2006 and Berntzen, 2007, respectively.

[34] See http://t4p.no