A survey of measurement methods for eGovernment user-satisfaction

Position paper

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1. Abstract

A survey on eGovernment user-satisfaction measurement methods was conducted to enable a comparison among them, and to facilitate a discussion on good practices. The collected pieces of information cover the methodologies in terms of their properties, and measurement practices. The analysis in this paper is based on the results compiled by a survey in the eGovMoNet project.[1] The main findings from our analysis are:

- The surveyed methods have not been standardised through an official standards organisation.
- Although there are established relevant standards, for aspects covered by the methodologies e.g. concerning usability or accessibility, the measurement methods rarely refer to them.
- Software vendors are mostly not included in the intended group of users of the measurement results.
- Assessment and evaluation of the current situation of measured objects to identify bottlenecks is not carried out frequently.
- 'Ex-post' measurements are far more popular among the surveyed methods. Although, 'ex-ante' and 'in between' measurements are expected to save money, time and effort.
- Several of the surveyed measurement methods are not regularly updated or maintained in a transparent way.
- Only with one possible exception (UWEM) the surveyed measurement methods do not have an open process for the methodology development, nor an open document license for the methodology document.

1 The eGovMoNet, Thematic Network is co-funded by the European Commission, under the CIP project number 224998. Project period: 2008-05-01 – 2010-05-01. The network has close to 50 members who have signed up as partners and are using, or developing eGovernment measurement methods from Belgium, Denmark, Germany, Greece, Hungary, Italy, Norway, Slovakia, Spain, Sweden, The Netherlands and UK. The eGovMoNet ePractice community counts well over 300 members across Europe. See also http://www.epractice.eu/community/egovmonet.

2. Introduction

In this paper we will summarise the main properties of the measurement methods as described in the questionnaires completed by partners of the eGoMoNet project dealing with user-satisfaction measurement methods.

The remainder of this paper is organised as follows: The next section gives a brief overview of the questionnaire and the group of respondents. The subsequent section explores the results of the survey. Finally, the paper concludes with the a discussion on the main findings.

3. Questionnaire and sample overview

The eGovMoNet questionnaire is intended to support the description of eGovernment measurement methods to share the current practices and the experience deploying them. Using this questionnaire, the features in common and the differences among the methods may be identified, to support steps towards converging practices in a collaborative process. The questionnaire[2] was prepared through successive work group discussions.

The eGovMoNet partners filled the questionnaire to describe eGovernment user-satisfaction measurement methods as used in their respective countries. The respondents are in general practitioners from the field of eGov measurements, involved in measurement development or advanced users of measurement results. Further details on the surveyed measurement methods is available in the appendix.

4. Survey results

This section explores the results of the eGovernment measurement methods covered by the eGovMoNet user-satisfaction measurement methods survey. The following subsection describe the general properties of the measurement methods, the intended use of their results, their deployment properties and their maintenance.

4.1. General properties of measurement methods

The majority of the respondents claim that their measurement methods are capable of giving the same results if two independent measurements of the same measurement object were conducted (Repeatability of measurement results). Moreover, most of the methods results are size independent which implies that the measurement methods cope with measuring different sizes of eGovernment applications (Independence of size). It is also possible to compare the measurement results over time for most of the methods to identify trends (Stability of measurement results over time). Additionally most of the methods include indications of their results accuracy (Accuracy).

Apparently most of the surveyed methods have good general properties, however, only a minority of the methods refers to established standards such as those developed by WAI/W3C (Degree of standardisation), which by no means helps in decreasing the heterogeneity in measurement practices. All results of general properties of surveyed methods are shown in chart 1.

2 The questionnaire is available at: http://epractice.eu/community/egovmonet/view_resources/templatetodescribemeasurementmethodologyv12. Please contact the authors for further details on the filled questionnaires.

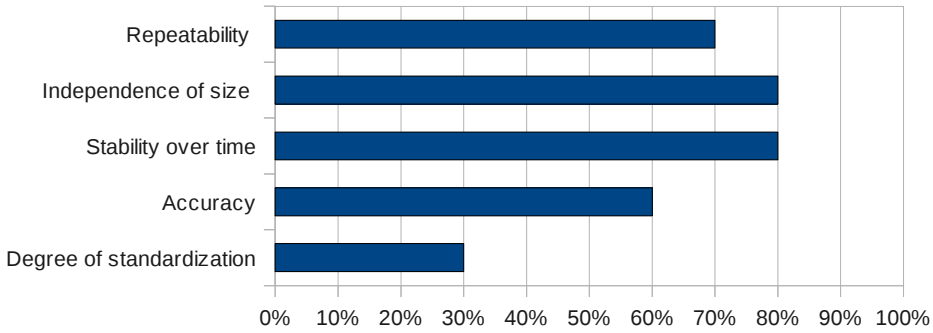

Chart 1: General properties of surveyed measurement methods

4.2. Intended use of measurement results

Nearly all surveyed methods were designed to promote targeted changes on the implementation level. The majority of them promote targeted changes on the organisational procedures level. Only targeted changes on the policy level come with lower score among the surveyed methods. Chart 2 shows the results on this level.

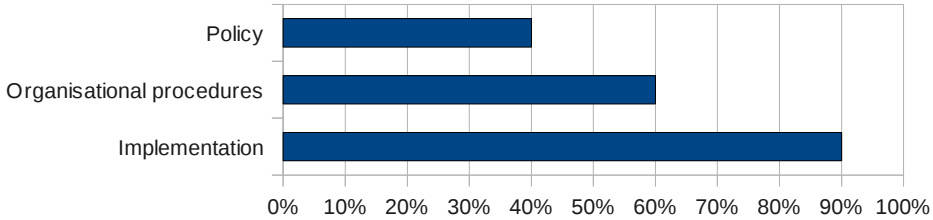

Chart 2: Targeted changes levels of surveyed measurement methods

Moreover, chart 3 shows that 60% of surveyed measurement methods are intend to support strategic decision in general. Half of these decisions are to select projects to invest in.

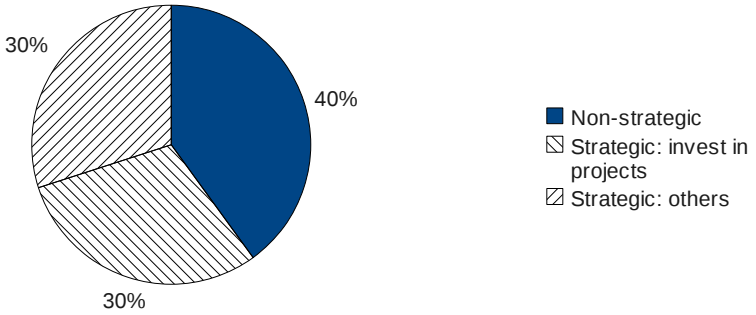

Chart 3: Is the measurement intended to support strategic decisions?

4.2.1. Intended users of the measurement results

While policy makers, website owners and developers are the highest intended users of the surveyed measurement methods' results, software vendors are mostly not intended to use measurement results. In spite of the fact that software vendors are key players when it comes features and quality of the provided service, for example the accessibility level of eGovernment websites (DIFI 2009).

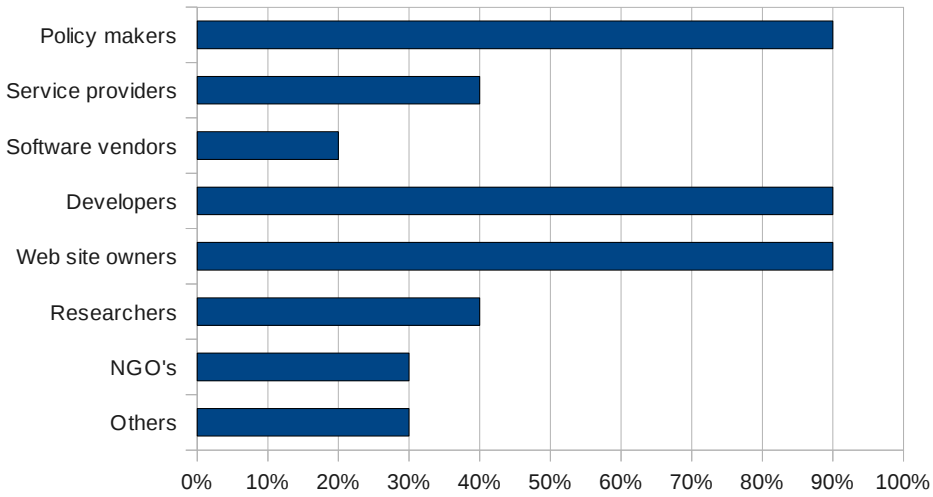

Chart 4: Intended users of the measurement results

4.2.2. Reasons for measurements

In addition to user satisfaction measurement, the surveyed measurement methods have other aims. All the methods aims at assessing and evaluating the current situation. Benchlearning, strategic or operational objectives and measure impact of policies come in the second rank.

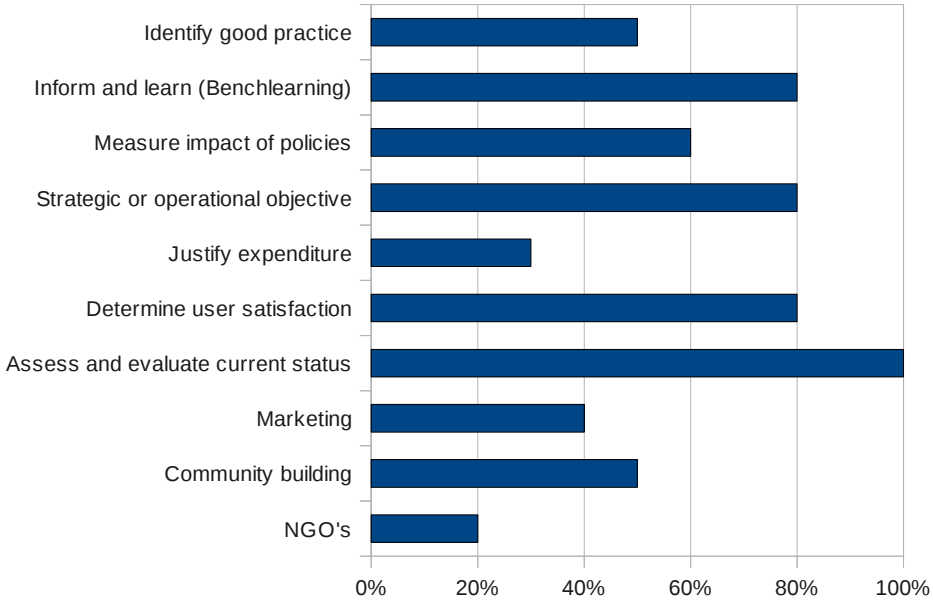

Chart 5: Reasons for measurements

Continuous improvement is the most frequent reason behind assessment and evaluation of current situation of measured objects for most of the methods. On the other hand, despite its importance, identifying bottlenecks is not frequent as shown in chart 6.

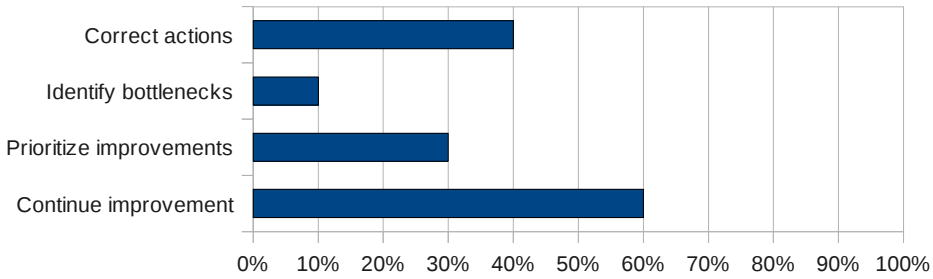

Chart 6: Reasons to assess and evaluate the current situation

4.3. Deployment properties of measurement methods

4.3.1. Who carries out measurement?

Independence of measurement subject

For neutrality some measurement methods require independence between those who carry out measurement and the measurement subject (DETR 2000). 60% of the surveyed measurement methods are carried out by merely third parties. Other combinations includes third parties, measuring and measured organisations. Chart 7 presents the results of who carries out the measurement question in the survey questionnaire.

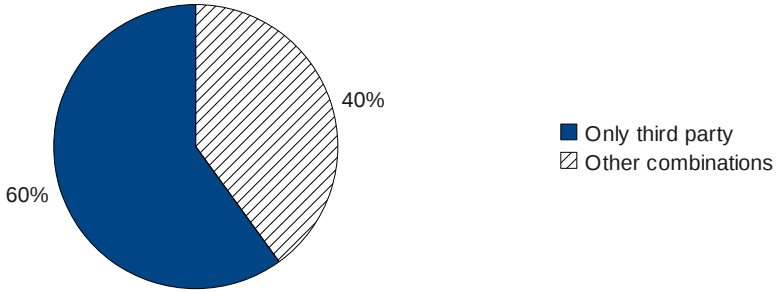

Chart 7: Who carries out the measurement?

Training requirements for evaluators

40% of the surveyed measurement methods don't require training evaluators, and none of the methods requires the evaluators to possess any kind of certificates to carry out the evaluation process as apparent in chart 8.

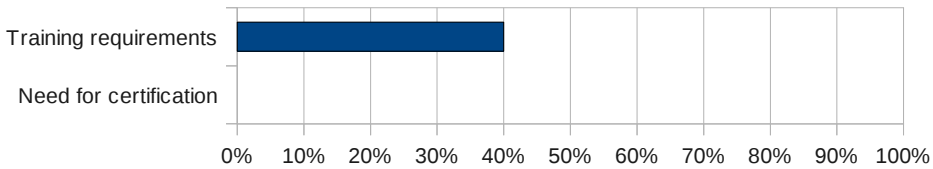

Chart 8: Training requirements for evaluators

4.3.2. How is measurement carried out?

40% of surveyed methods are carried out merely using manual methods, the rest are carried out using combinations of automatic and manual methods as shown in chart 9. The manual methods in general consist of experts opinions and users feedback. Chart 10 shows that 30% of the methods use merely users feedback, while the rest uses a combination of experts opinions and users feedback.

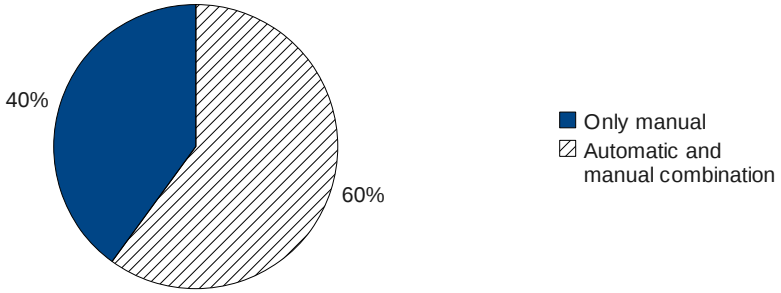

Chart 9: How are the measurement methods carried out?

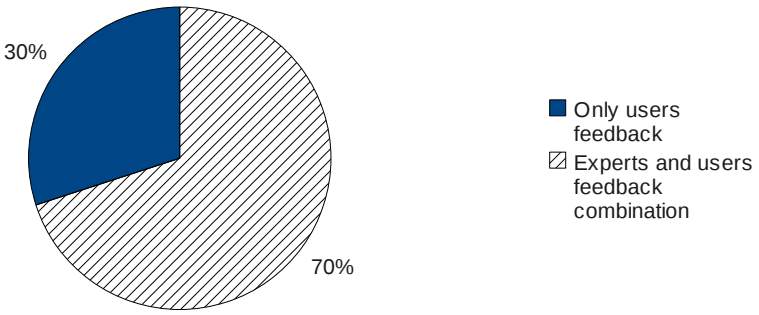

Chart 10: Manual methods

On-line methods to collect opinions and feedbacks like web questionnaires, computer aided web interviewing, crawler technologies are slightly more common than off-line methods like phone calls, computer assisted telephone interviewing, and face to face interviews or focus groups.

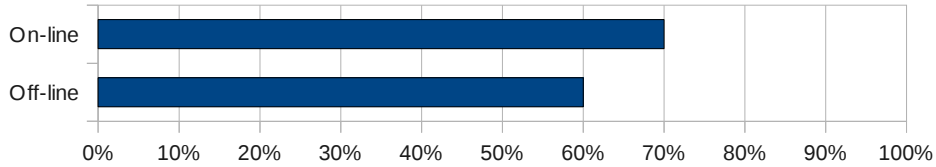

Chart 11: Methods of collecting users and non-users opinions

Manual sampling are more popular than automatic sampling as shown in chart 12.

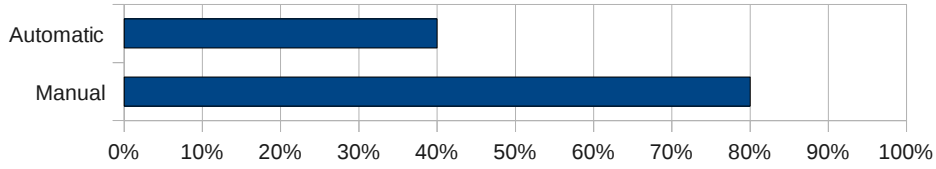

Chart 12: Sampling method

4.3.3. When to measure?

In general measurements could be conducted in one of three times through a project life:

1. 'Ex-ante', where ideas to be implemented before starting implementation are the focus (Land 1982; Sorrentino 2010)
2. 'Ex-post', where project outcomes are the focus (Land 1982; Sorrentino 2010)
3. 'In between'

Chart 13 shows that 'ex-post' measurements are far more popular among the surveyed methods, which is logic for user-satisfaction measurements. However, more 'ex-ante' and 'in between' measurements are expected to save money, time and effort by avoiding implementing services that users are not interested in and by implementing services in ways that will satisfy the users.

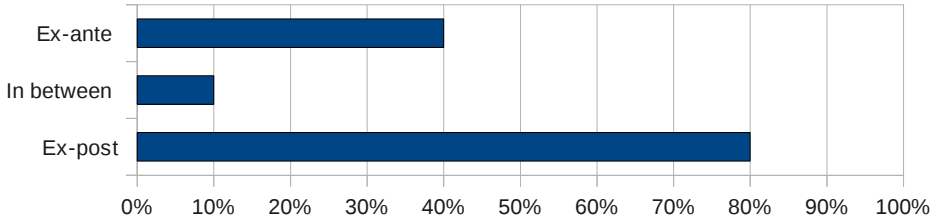

Chart 13: Measurement timing

40% of the surveyed measurement methods are not periodic (or not known) at all, once or less per year periodicity are more common among the rest; leaving only 20% of the surveyed methods to have periodicity of more than once per year. Clearly, higher measurement periodicity can track changes in users needs in better way.

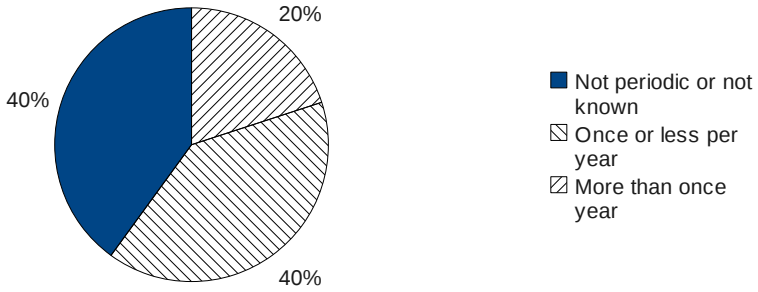

Chart 14: Measurement periodicity

4.3.4. Results from the measurement methods

Resulting score or indicators

60% of the surveyed methods result in combinations of qualitative and quantitative indicators, while qualitative scores are more common among the reminder.

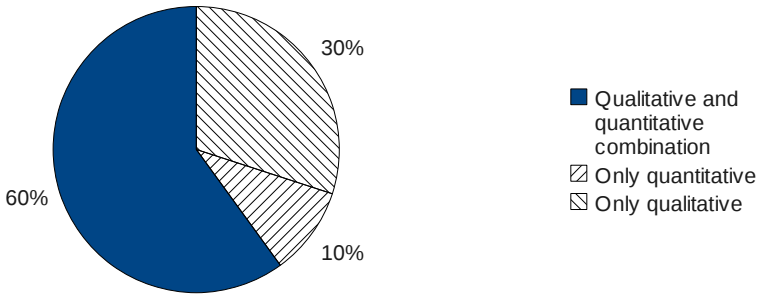

Chart 15: Resulting score or indicators

Measurement result reporting

Chart 16 shows the properties of result reports of the surveyed measurement methods. Nearly all surveyed methods have their results available to external bodies (Availability of results). Transparency of measurements (Transparency) is among the highest ranked results as well.

Possibility of recomputing score by a third party (Repeatability by a third party) and having different reports to address different stakeholders (Multi-view) – although still having good results – are the lowest ranked properties of measurement reporting.

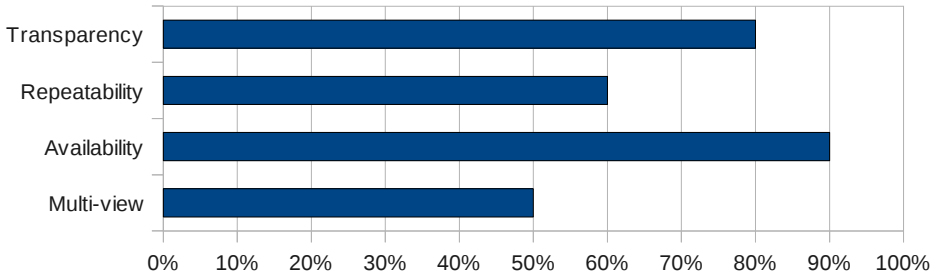

Chart 16: Properties of measurement results report

4.4. Maintenance of measurement methods

As shown in chart 17, only with one possible exception (UWEM) the surveyed measurement methods do not have an open process nor an open method document license like for example, Creative commons share alike. UWEM is not placed in the hands of a formal development organisation. However, there has been several open hearings on the methodology, and extended invitations for interested parties to participate in the development.

Only half of the surveyed methods have organisations responsible for maintenance process, however, 30% of the methods are regularly updated. Furthermore, only 20% of the methods have a change management process to collect comments e.g. from those using the method or those responsible for subjects being measured.

In a fast changing field like eGovernment, measurement methods need to be regularly updated. A working understanding of what is measured and how the measurement is carried out may be essential to make efficient use of the results. However, the results show that measurement methods are generally not regularly updated nor maintained in a transparent way.

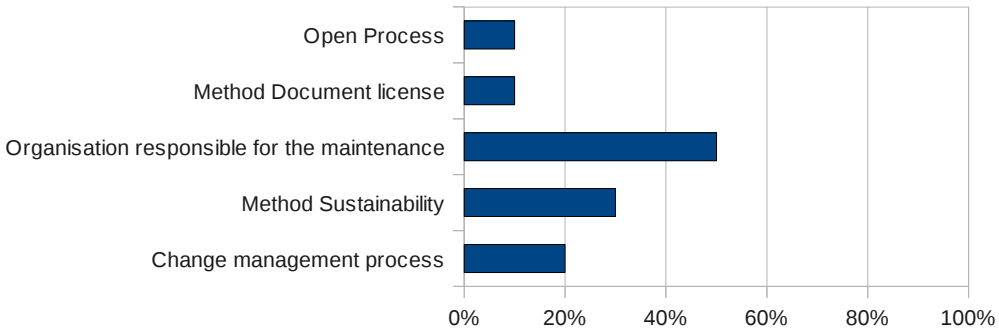

Chart 17: Maintenance of measurement methods

5. Concluding discussion

5.1. Main findings

In the following we list the main findings from the analysis of the eGovMoNet survey results.

- The surveyed methods have not been standardised through any of the national or international standardisation organisations. Standardisation efforts could contribute to harmonisation of measurement practices.
- Although there are established relevant standards, e.g. concerning usability or accessibility, the measurement methods rarely refer to them. A reference to existing standards even for parts of the methodology can be a step towards harmonisation.
- Software vendors are mostly not included in the intended group of users of the measurement results. Software vendors generally develop most of the technical context of eGov services. Efficient feedback from measurements may enable them to produce better online services.
- Assessment and evaluation of the current situation of measured objects to identify bottlenecks is not carried out frequently. Periodic and comparable measurements are key to enable exploration of trends.
- 'Ex-post' measurements are far more popular among the surveyed methods. 'Ex-ante' and 'in between' measurements are expected to be more efficient to identify services that users are interested in, and good ways to implement them, to save public spending, and time both for government agencies and from citizens.
- The surveyed measurement methods are generally not regularly updated or maintained in a transparent way. A rapidly developing field like eGovernment will require a also the measurements to be regularly updated to remain relevant. A transparent process can be helpful to enable wider participation and acceptance.
- Only with one exception the surveyed measurement methods do not have an open process nor an open document license like for example, the Creative commons share alike license. The Unified Web Evaluation Methodology (UWEM) has an open license. However the development process is not placed in the hands of standards organisation therefore the development process may be open but not formally accountable like the those for standards organisations.

5.2. Future work

To improve the overview of the methodologies in use, the number of respondents and countries represented can be extended for a new iteration of the survey. The user-satisfaction survey was completed by 9 responses representing 7 countries.

Also the list of surveyed methodologies can be extended to be more complete. Related work on customer satisfaction, and some commercial tools for eGov measurement would be interesting to include. Also other approaches to observe how the methods work in practice can be considered. For example a series of comparisons of measurement results compiled by independent experts to determine practical repeatability, and accuracy.

The eGovMon survey has largely been completed by respondents who are measurement practitioners, or involved in the methodology development. To get a more complete view of some of the aspects such as the usefulness of the measurement results, we would also suggest to prepare a supplementary survey on these issues targeted to the intended users of the measurement results.

Finally, an area where a revised survey approach may help is the cost- benefits analysis for from the eGov measurement. We would like to explore how this can be mapped to efficiency and impact of the measurement on the measured eGov system.

6. References

DETR. 2000. *Best Value and Audit Commission Performance Indicators for 2000/2001* Volume I - User Satisfaction Performance Indicators: Guidance on Methods of Data Collection. April. http://www.communities.gov.uk/documents/localgovernment/doc/145998.doc. (accessed 2010-11-08).

DIFI. 2009. *Ekspertvurderinger innen universell utforming*. Report prepared by Netlife Research for Difi. http://www.universell-utforming.miljo.no/file_upload/difi_uu_rapport.pdf, (accessed 2010-11-08).

DIFI, 2010, *Universell utforming Samfunnsmessige konsekvenser ved innføring av pliktige standarder for web*, Report prepared by Standards Norway for Difi, http://www.standard.no/Global/PDF/Universell%20utforming/Samfunnsmessige-konsekvenser-endelig%20samlet.pdf, (accessed 2010-11-08).

Land, Kenneth C. 1982. Review: Ex Ante and Ex Post Assessment of the Social Consequences of Public Projects and Policies. *Contemporary Sociology* 11, no. 5 (September): 512-514. http://www.jstor.org/stable/2068390, (accessed 2010-11-08).

Sorrentino, M. 2010. The Challenges of e-government Evaluation. In *Information Systems: People, Organizations, Institutions, and Technologies*, ed. Alessandro D'Atri and Domenico Saccà. Heidelberg: Physica-Verlag HD. http://www.springerlink.com/content/pu4l30n7v47nl515/.

Snaprud, M., A. Velazquez, J. Jarke, 2010, *eGovMoNet progress and preliminary results*, Eastern European eGov Days 2010 , eeeGov, Prague 2010.

7. Appendix

The following table presents the background information of the surveyed measurement methods:

Method name	*Responsible organisation*	*Country*
Fed-eView/Citizen	Belgian government the Federal Public Service ICT (FEDICT)	Belgium
UWEM[3]	Katholieke Universiteit Leuven	Belgium
Agios Stefanos Municipality	Agios Stefanos Municipality	Greece
Mystery User Methodology	Observatory for the Greek Information Society	Greece
Regione Emilia-Romagna	Regione Emilia-Romagna	Italy
Slovakia	n.a.	Slovakia
Slovenia	• Ministry of Public Administration • Institute for Informatization of Administration at Faculty of Administration, University of Ljubljana • eCenter at Faculty of Organizational Sciences, University of Maribor	Slovenia
Technosite	Observatorio de Infoaccesibilidad de Discapnet (Disc@pnet InfoAccessibility Observatory)	Spain
Business Link	Business Link	UK
Directgov	Directgov	UK

3 Information about UWEM is based on a questionnaire filled by the Katholieke Universiteit Leuven, from the eGoMoNet survey on impact measurement methods, supplemented by information from the team at the University of Agder