Research Philosopy and Methodologies of e-Government : Update From ECEG and ICEG

Muhammad Yusuf, Carl Adams and Kate Dingley
School of Computing, University of Portsmouth, UK
muhammad.yusuf@port.ac.uk
carl.adams@port.ac.uk
kate.dingley@port.ac.uk

Abstract: The aim of this paper is to identify research philosophy, methodologies and methods used in E-Government studies. The E-Government domain is interdisciplinary and consequently is likely to draw upon various research methodologies. It is important to identify methodologies used by researchers and practitioners from around the world because of the many lessons can be learnt from other researchers and practitioners and their methodologies.This paper attempts to examine all of research paper abstracts from the European Conference on E-Government (ECEG) Proceedings from 2007 to 2012 and International Conference on E-Government (ICEG) Proceedings from 2007 to 2010. This enables us to identify and classify a range of research methods and approaches used within the E-Government domain. Furthermore, the results can be categorised into research paradigm, research approach, research methodologies, research methods and way to conclusion. This paper uses graphics to represent the different methodologies and methods used as well as graphics of the top ten methodologies and methods. Comparison and evaluation of the results are made with previous works such as Heeks and Bailure (2007), Pedro and Bolivar (2010), also Bannister and Connoly (2010) and others. The results show the top ten methodologies in ECEG from 2007 to 2012 are (1) Case Study, (2) Not Clear Stated, (3) Survey, (4) Literature Review, (5) Questionnaire, (6) Empirical Approach, (7) Interview, (8) Quantitative and Qualitative, (9) Qualitative, (10) Statistical. Moreover, Top ten methodologies on ICEG from 2007 to 2010 are (1) Case Study, (2) Not Clear Stated, (3) Survey, (4) Questionnaire, (5) Interview, (6) Empirical Approach, (7) Quantitative Empirical, (8) Qualitative, (9) Extensive Review of Literature Review, (10) Qualitative and Quantitative. This examination of results shows that E-Government has a large variety of research philosophies, research methodologies and research methods from the extreme continuum positivist and social constructivist, pure qualitative, pure quantitative to mixed methodologies. It is not surprising that case study is the dominant methodology followed by survey as the dominant method, as this fits well with the notion that E-Government is a multidisciplinary area of research using a variety of research methodologies and methods, E-Government is changing and is becoming more mature as a discipline, but is also becoming more complex and thus harder to analyse and research.

Keywords: e-Government, ICEG, ECEG, research philosophy, research paradigm, research approach, research methodologies, research methods, way to conclusion

1   Introduction

E-Government as a discipline has various research methodology. Some researchers have been conducted research on research phlosophy and methodologes, such as Heeks and Bailure (2007), Pedro and Bolivar (2010), Bannister and Connoly (2010) and others. Heeks and Bailur (2007) examined view points, philosophies, theories and methods of E-Government based on two journals and one conference such as Information Polity from 2002 to 2004 volume 7 to 9, Government Information Quarterly from 2001 to 2005 volumes 18 to 22 and European Conference on E-Government from 2001 to 2005 (Heeks & Bailur, 2007). Pedro and Bolivar also studied about methodologies on E-Government from 321 article published on Journals from Information Science and Library Science also Public Administration Subjects (Bolívar et al., 2010) . Bannister and Connoly discussed about research approaches from 544 papers presented on ECEG from 2001 to 2009 (Bannister & Connoly, 2010)

Hence, this paper is continuing previous researches discussing research philosophies, methodologies and methods in E-Government domain from European Conference on E-Government (ECEG) 2007 to 2012 and International Conference on E-Government (ICEG) 2007 to 2010. The author of ths paper was focusing on abstracts of 612 papers.

This paper aims to show various research philosophy and methodologies in E-Government domain which are change over time. Those changes illustrate that E-Government is a dynamic and more mature as a discipline.

Hopefully, this paper makes contribution to examine research philosophy and methodologies used in E-Government area. It also hopes to contribute to understand E-Government research practicalities by conducting repeatable method of structured literature review. Therefore, this paper is important for E-Government researchers as a refererence to conduct research in E-Government area. In the future, It also important for researchers to understand research opportunity in E-Government area by using research philosophy and methodologies which are still few practices.

Brief structure of this paper will be Introduction, Research methods, Finding and Analysis, Conclusion, Acknowledgement and References

2   Research methods

This paper investigates research philosophy and methodologies based on literature review from abstract of papers from Proceedings of European Conference on E-Government (ECEG) 2007 to 2012 and International Conference on E-Government (ICEG) from 2007 to 2010.   Firstly, the authors of this paper searched conferences about E-Government. The keyword "Conference E-Government" put on Google Searching and found there are some conferences in this area, such as:

- European Conference on E-Government (ECEG) organized by Academic Conferences and Publishing International Limited (ACPI)
- International Conference on E-Government (ICEG) organized by Academic Conferences and Publishing International Limited (ACPI)
- International Conference on E-Government (ICEG) organized by World Academic of Science, Engineering and Technology (WASET)
- GCC E-Government and E-Services Conference organized by Datamatix
- International Conference on E-Business and E-Government (ICEBEG) organized by Social Sciences Research Society (SoSReS).
- International Conference on Theory and Practice of Electronic Governance (ICEGOV) organized by Center for Electronic Governance – United Nations University (UNU), International Institute for Software Technology (IIST).
- International Conference on Information Technology, E-Government and Applications (ICITEA) organized by Institute of Information System and Research Centre (IISRC)
- Conference for E-Democracy and Open Government (CEDEM) organized by Faculty of Business and Globalization – Danube University Krems
- IFIP E-Government Conference (EGOV) organized by IFIP
- International Conference on e-Democracy, e-Government and e-Society (ICDGS) organized by World Academic of Science, Engineering and Technology (WASET)

Secondly, the authors of this paper focused on European Conference on E-Government (ECEG) and International Conference on E-Government (ICEG). Both of these Conferences are organized by Academic Conferences and Publishing International Limited (ACPI). Those conferences chosen because European Conference on E-Government (ECEG) was the first conference focus on E-Government in Europe since 2001 and held regularly every year until now (Bannister & Connoly, 2010). Furthermore, International Conference on E-Government (ICEG) determined because this conference has been held since 2005 until now. Hence, both of conferences are the most established conferences on E-Government area. Those conferences also have authors of papers from countries around the world and all of the continents, therefore it represents discussion about E-Government issues around the world.

In addition, there are some other justification why chose those conferences. European Conference on E-Government (ECEG) proceedings ("European Conference on E-Government", 2013) are indexed in the Thomson Reuters ISI The Web of Science (WOS) Conference Proceedings Citation and the Institution of Engineering and Technology in the UK. The ICEG proceedings are also listed in the Thomson Reuters ISI Index to Scientific and Technical Proceedings (ISTP/ISI Proceedings), the Thomson Reuters ISI Index to Social Sciences & Humanities Proceedings (ISSHP), the Thomson Reuters ISI Index to Social Sciences & Humanities Proceedings (ISSHP/ISI Proceedings) and EBSCO database of Conference Proceedings. Moreover, ICEG proceedings indexed by the Institution of Engineering and Technology in the UK. Some good papers from ICEG and ECEG will published in the Electronc Journal of E-Government (EJEG). The EJEG is Rated level 1 in the Danish Government

bibliometric lists, Indexed by the Institution of Engineering and Technology in the UK, listed in Ulrich's Periodical Directory, the Norwegian Social Science Data Services, the Open Access Journals database, the EBSCO database of electronic Journals and the Cabell Directory of Publishing Opportunities

Based on website of ICEG http://academic-conferences.org/iceg/iceg-home.htm, International Conference on E-Government (ICEG) was not held at 2011 and 2012. Therefore, the authors of this paper only focused on International Conference on E-Government (ICEG) from 2007 to 2010. The authors of this paper reviewed abstracts of papers from Conferences 2007 because there are some papers cover E-Government issues before 2007, but limited papers covered E-Government issues since 2007 to 2012.

Thirdly, the authors of this paper reviewed 612 abstracts and find out methodologies and methods used by authors of conferences papers. Some papers have clearly methodologies and methods presented on the abstracts but some others are not clear stated. Therefore, unclear methodologies and methods classified as Not Clear Stated. For instance, the authors of conference paper only wrote countries where the research done without wrote clearly that it used case study. So that, those papers classified as a case study researches.

Then, next steps are collected terms which relevance to research philosophy, methodolologies and methods and also counted how many papers for the term. For example, how many papers stated case study on the abstract.

Fourthly, the collected terms identified and categorised into Research Paradigms, Research Approaches, Research Methodologies, Research Methods, Way to conlusion and other. Other category refers to Not Clear Stated. Then, the results presented into graphic of research approaches, research methodologies and research methods of ICEG from 2007 to 2010 and ECEG from 2007 to 2012 as well as top ten of methodologies and methods of ICEG from 2007 to 2010 and ECEG from 2007 to 2012. In other hand, research paradigm, way to conslusion and other categories are not presented into graphics since the number of those classifications are quite small.

3   Findings and analysis

In this section, the authors of this paper present classification of research hilosophy and methodologies in E-Government area. The collected data will be classified into research paradigms, research approaces, research methodologies, research methods, way to conclusion and others. Table 1 below illustrates methodologies and methods from European Conference on E-Government (ECEG) 2007 to 2012.

Table 1: Methodologies and methods from ECEG 2007 to 2012

CATEGORIES	ITEMS	NUMBER
Research Paradigms	Critical Realist	1
	Interpretive	1
Research Approaches	Quantitative and Qualitative	8
	Quantitative	3
	Empirical Quantitative	1
	Qualitative	8
Research Methodologies	Case Study	325
	Empirical Approach	13
	Exploratory Study	2
	Soft system methodology	1
	Q Methodology	1
	Hybrid Methodology	1
	Ethnographic	1
	Comparative Analysis	2
	UN/CEFACT Modelling Methodology	2
	System Thinking Methodologies	1

Muhammad Yusuf, Carl Adams and Kate Dingley

CATEGORIES	ITEMS	NUMBER
	Grounded Theory	2
Research Methods	Survey	39
	Literature Review	22
	Questionnaire	21
	Interview	10
	Statistical	5
	In-Depth Interview	4
	Structural Equation Modelling	3
	Workshop / Focus Group	3
	Document analysis	2
	Semi structured telephone interviews	2
	Recorded interviews	2
	Website analysis	1
	Semiotic Analysis	1
	Comparative Semi-structured interviews	1
	Online Survey	1
	Archival Search	1
	Annual Reports	1
	Web-based research	1
	Online Questionnaire	1
	Checklist	1
	Brainstorming	1
	In-depth semi structured interviews	1
	Meta-analysis	1
	Systematic Approach	1
	Formal Method	1
	Regression and correlational analysis	1
	Linear Regression analysis	1
	Structured and Semi-structured interview	1
	Enterprise Model Assembly Method	1
Way to Conclusion	Inductive study	1
Others	Not Clear Stated	151

Table 2: Methodologies and methods from ICEG 2007 to 2010

CATEGORIES	ITEMS	NUMBER
Research Paradigms	Interpretative	1
Research Approaches	Quantitative Empirical	4
	Qualitative	4
	Qualitative and Quantitative Empirical	3
Research Methodologies	Empirical Approach	5
	Soft System Methodology (SSM)	1
	Case Study	94
	Usability Research	1
	Complex Thinking Theory	1

CATEGORIES	ITEMS	NUMBER
	Comparative Approach	1
	Questionnaire	7
	Survey	13
	Extensive review of literature review	4
	Government Documents	2
	Research Reports	1
	Observation	1
	Browsing	1
	Comperehensive Content Analysis	1
	Desk Research	1
	Interview	7
	In-Depth Interviews	1
Research Methods	Intensive review of literature review	4
	Telephone Interview	1
	Dialoguecircles	1
	Semi-structured interview	1
	Focus Group Deliberation	1
	In-Depth Document Analysis	1
	In-Depth Review	1
	Meta-analysis	1
	Formal Method	1
	Formal Method-Equation based method	1
	Structural Equation Analysis	1
	Correlational Research	1
Way to conclusion	Inductive	1
Others	Not Clear Stated	36

Table 1 and 2 above present that research paradigms on E-Government domain are Interpretative and Critical Realist. There are various research approaches include Qualitative, Quantitative and Mixed method. In those conferences, Quantitative approach stated as Quantitative, Quantitative Empirical or Empirical Quantitative as well as mixed method stated as Qualitative- Quantitative and Qualitative-Quantitative Empirical. Both of tables above also describe that case study is a dominant methodology as well as survey as a dominant method. Some of papers authors did not states clearly that they used case study, but they only wrote place or country where their research done. Therefore, those papers are categorised as a case study research paper. A lot of authors did not stated what methodologies or methods which they used, hence those grouped as Not Clear Stated.

Figure 1 and 2 illustrates Research methodolodies used from European Conference on E-Government (ECEG) 2007 from 2012 and International Conference on E-Government (ICEG) 2007 to 2010. Y axis refers to number of paper and X axis refers to year of conference. Those figures above describe various methodologies in E-Government domain such as Case study, Empirical Approach, Soft system methodology (SSM), Usability Research, Comparative Approach, Exploratory Study, Q Methodology and Hybrid Methodology. Both graphics illustrate case study is the most popular of research methodology.

Figure 3 and 4 illustrate varieties of research methods used from European Conference on E-Government (ECEG) 2007 to 2012. Y axis refers to number of paper and X axis refers to year of conference. There are many varieties of methods used on E-Government paper from Desk research to empirical research as well as quantitative to qualitative. Clearly, survey is a dominant method in ECEG 2012 and ICEG 2007 to 2009.

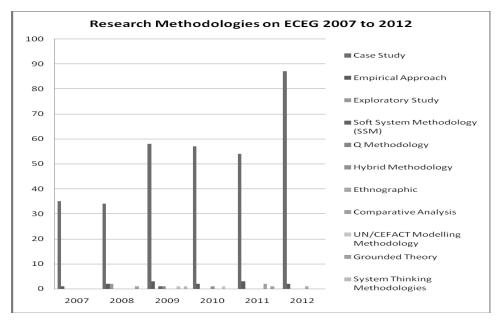*Muhammad Yusuf, Carl Adams and Kate Dingley*

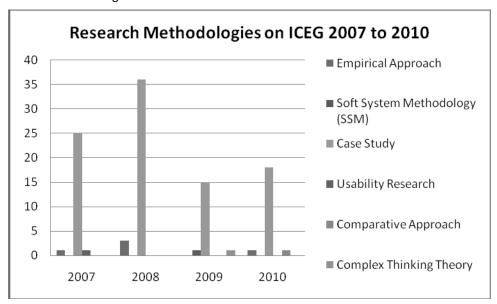**Figure 1:** Research methodologies on ECEG from 2007 to 2012

Figure 2: Trend of research methodologies on ICEG 2007 to 2010

Figure 5 and 6 illustrates top ten methodologies and methods used by the authors of papers in ECEG from 2007 to 2012 and ICEG from 2007 to 2010. Both of Conferences has similar trends such as case Study is the most popular and always be the highest number of method in every year conference. The second highest number method is Not Clear stated. Both figures also point out that E-Government research also conducted through various methods such as survey, Questionnaire, Interview, Empirical Approach and Literature review or Extensive Literature Review.

In summary, E-Government research can be done from both sides of two extreme continuum include positivist and social constructionist paradigm, also the middle position of both. Positivist paradigm paradigm is one of the extreme paradigm which needs key factors in E-Government, for instance, the technology and the culture existence and assumes that gathering of data is independent from the researcher's interest. Positivist researchers will work to build knowledge from the relation and generalisation of laws. On the other extreme paradigm is social constructionist which researchers set up assumptions that object's acceptance such as technology depends on individual perceptions and how they have value of technology. Hence, it will be subjective based on the researchers' perceptions, values and meanings. The consequences are likely the knowledge will be constructed by individual interactions between each other as well as the data and the gathering of the data process. All of those processes cannot be independent from researcher's interest and

construction. In addition, the middle position between the positivist and the social constructionist is a compromise between both paradigms (Heeks & Bailur, 2007)
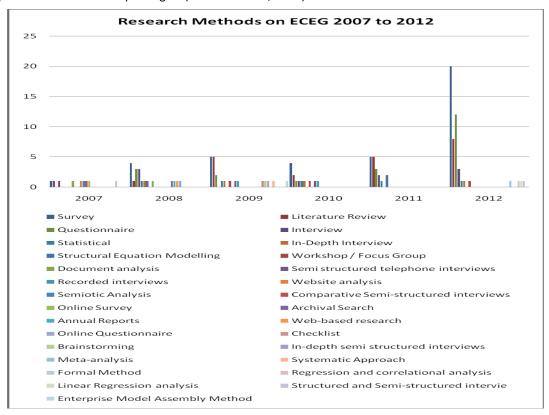

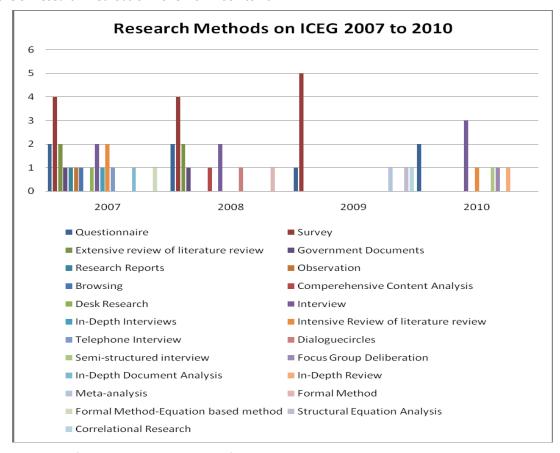**Figure 3:** Research methods on ECEG from 2007 to 2012

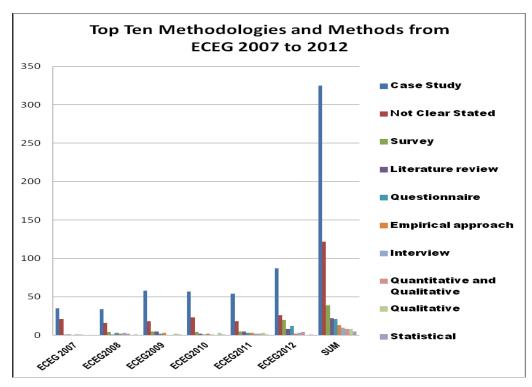**Figure 4:** Trend of research methods on ICEG from 2007 to 2010

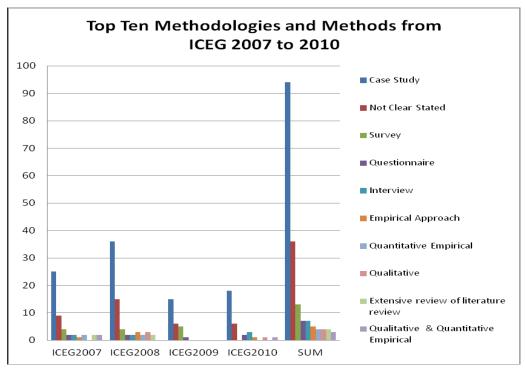**Figure 5:** Top ten methodologies and methods of ECEG from 2007 to 2012

Figure 6: Top ten methodologies and methods of ICEG from 2007 to 2012

While Heeks and Bailure (2007) analysed the papers, they did not find any concepts about research philosophy. Many researchers did not examine a base research philosophy regarding E-Government research. Most methods used were unclear and had a poor epistemology as well as deductive or inductive approaches. Furthermore, just few papers has clearly position as pure positive, some of papers has unclear positivist and no papers of social constructivist. So, there was a dominant research philosophy from one philosophy. Overall, further studies about research philosophy in E-Government are needed to make E-Government stronger as a discipline (Heeks & Bailur, 2007). This focussed literature review pointed out that there are changes and findings about research philosophy of E-Government since Heeks and Bailur published their paper. Case study was dominant and it represented social constructionist rather than positivist. In addtition, survey was

dominant besides various methods such as Questionnaire, extensive literature review, research reports, observation, interview, focus group deliberation, telephone interview, etc. It also found that conferences authors only used inductive approach in their papers. Therefofore, these findings are different and contrast with Heeks and Bailure results. It gives general insight that E-Government has varieties of research philosophy since authors of conferences papers presented about that, even though it needs further investigation, were they managed systematically and interrelated from research paradigms to research methods ? or just put some methods without considered a base methodology, approach, paradigm of methods chosen ?

In another paper, Pedro and Bolivar (2010) found empirical research methods are more dominant rather than non-empirical. The dominant quantitative methods consist of regression analysis, followed by structural equation modelling and evaluation research. The graphic of qualitative and quantitative trends showed qualitative methodology become decreased and quantitative methodology increased from 2000 to 2009. These results are similar with the focussed literature review of European Conference on E-Government (ECEG) and International Conference on E-Government (ICEG). The case study is always the dominant approach, as well as an empirical approach. In ICEG and ECEG, some authors used a mixed approach of qualitative and quantitative besides pure qualitative or pure quantitative or quantitative empirical without trend of qualitative, trend of quantitative and trend of qualitative-quantitative based on ICEG and ECEG, hence it cannot be compared to the trend at the moment.

Bannister and Connolly (2010) pointed out conceptual and case by case approaches as investigation paper are dominant but number of theoretical paper was very small. Comparing to the mixed ICEG and ECEG, it has same result which case study papers are dominant, in other hand there was not investigation about conceptual papers on mixed ICEG and ECEG, therefore it cannot be compared as well.

In summary, the comparison between the conclusions of Heeks and Bailur, Pedro and Bolivar and Bannister and Connolly plus the focussed literature review shows that E-Government research uses varieties research philosophies, methodologies and methods from the extreme continuum positivist and social constructivist or pure qualitative and pure quantitative to mixed and compromise of both. E-Government is more mature as a discipline. Indeed, there are changes in research philosophy and methodologies over time and it illustrates that E-Government is a dynamic domain.

4   Conclusion

The paper hopes to make contribution by providing a structured literature review capturing philosophy, methodologis and methods from research in the two main conferences in the E-Government area. It also hopes to contribute to understand E-Government research practicalities by conducting repeatable method of structured literature review.

As the E-Government discipline matures, it is useful to examine the main themes that have emerged, such as the main research methodologies used and topics of interest. This will help to inform future researchers on the tried and tested methods open to them as well as research innovation.

The structured literature review also provide an example guidance to other researchers, particularly early researchers, on options for conducting repeatable literature review methods capturing input from large numbers of reference material from around the world.

There are various research paradigm, research approach, research methodologies, research methods and way to conclusion used by researchers from European Government on E-Government (ECEG) 2007 to 2012 and International Conference on E-Government (ICEG) 2007 to 2010. The research paradigms includes Interpretative and critical realist. This pape also shows various research approaches consist of qualitative, pure quantitative and mixed method as research approaceas. Overall, case study and survey are dominant methods used by E-Government researchers.

Furthermore, the top ten methodologies from European Government on E-Government (ECEG) 2007 to 2012 are (1) Case Study, (2) Not Clear Stated, (3) Survey, (4) Literature Review, (5) Questionnaire, (6) Empirical Approach, (7) Interview, (8) Quantitative and Qualitative, (9) Qualitative, (10) Statistical. Moreover, top ten methodologies from International Conference on E-Government (ICEG) 2007 to 2012 are (1) Case Study, (2)

Not Clear Stated, (3) Survey, (4) Questionnaire, (5) Interview, (6) Empirical Approach, (7) Quantitative Empirical, (8) Qualitative, (9) Extensive Review of Literature Review, (10) Qualitative and Quantitative Empirical.

The results above illustrate that there are changes in E-Government domain includes research philosophy and methodologies. E-Government also growth and more mature as a disciplne since researchers used various research philosphy and methodologies in this domain,

In the future, it seems interesting to conduct E-Government research using positivist paradigm, non-case study, non-survey, deductive and more discusssion about ontology, epistemology and axiology to strengthen E-Government domain.

Acknowledgements

References

Bannister, F., & Connoly, R. (2010). Researching eGovernment: A Review of ECEG in its Tenth Year. Paper presented at the 10th European Conference on E-Government (ECEG), University of Limerick, Ireland.

Bolívar, R., Pedro, M., Muñoz, A., Laura; López Hernández, & M, A. (2010). Trends of e-Government research: contextualization and research opportunities. The International journal of digital accounting research, 10(16), 6.

Borgmann, A. (1995). Does Philosophy Matter. Technology in Society, 17(3), 295-309.

Burrell, G., & Morgan, G. (1979). Sociological Paradigms and Organisational Analysis- Elements of the Sociology of Corporate Life. England: Ashgate Publishing Limited.

Gascó, M. (2012). Proceedings of 12th European Conference on E-Government

Heeks, R., & Bailur, S. (2007). Analyzing e-Government research: Perspectives, philosophies, theories, methods, and practice. Government Information Quarterly, 24(2), 243-265.

Holden, M. T., & Lynch, P. (2004). Choosing the appropriate methodology: understanding research philosophy. The marketing review, 4(4), 397-409.

Lavin, M. (2009). Proceedings of 5th International Conference on E-Government.

Maja Klun, M. D. a. T. J. (2011). Proceedings of 11th European Conference on E-Government.

O'Donnell, D. (2010). Proceedings of the 10th European Conference on E-Government.

Remenyi, D. (2007). Proceedings of 7th European Conference on E-Government.

Remenyi, D. (2008). Proceedings of 8th European Conference on E-Government.

Remenyi, D. (2009). Proceedings of 9th European Conference on E-Government

Remenyi, D. (2007). Proceedings of 3rd International Conference on E-Government.

Remenyi, D. (2008). Proceedings of 4th International Conference on E-Government.

Ruhode, E. (2010). Proceedings of 6th International Conference on E-Government.