

A Review of e-Government Research as a Mature Discipline: Trends, Themes, Philosophies, Methodologies, and Methods

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Abstract: This paper aims to identify themes, trends, research philosophies, methodologies and methods used in E-Government studies. This research uses a novel structure literature review method to capture the evolving research focus in the E-Government literature. It examines all abstracts from the European Conference on E-Government (ECEG) papers from 2007 to 2012 and International Conference on E-Government (ICEG) papers from 2007 to 2010. This paper also compares previous research covering themes and models of E-Government research. The research findings are: 1) case study and potential case study is dominant methods, 2) there are various research philosophy, methodology and methods on e-government field, and 3) e-government is evolving over time and is maturing as a discipline. An analysis also shows lack of works covering development of theory in e-government domain. This paper provides further contribution by using a novel approach for conducting a structured literature review, based on evaluating abstracts and key words, and in a corresponding method to method to validate classification of themes that emerge using focus group discussion sessions.

Keywords: e-government, themes, trends, philosophy, methodology, method, literature review, ICEG, ECEG

1. Introduction

This introductory section provides a brief overview of E-government. It then goes on to previous research, research aims, contributions, implications and structure of this paper.

E-Government is a relatively young discipline and evolving as new technologies emerges. It applied in an increasing number of government activity in many countries. Consequently, one would expect that E-Government research and activity also change and evolve particularly in the main themes, concepts, models, trends, philosophy, methodologies and methods.

There has been a selection of previous works that captures some of the changing and evolving focus of E-Government research activity as follows: Siau and Long (2005) proposed the five stage model using a qualitative meta-synthesis methodology; Irani, Love and Montezami (2007) summarised papers that examined the past, present and future aspects of E-Government; Yildiz (2007) reviewed the limitation of the E-Government literature; Heeks and Bailure (2007) examined view points, philosophies, theories and methods of E-Government based on journals and conference papers; Bertot, Jaeger and McClure (2008) presented various issues about citizen-centred e-government implementation; Wimmer, Codagnone and Janssen (2008) identified 13 themes in the eGovRTD2020 project. Those 13 themes were summarised from regional workshops with experts, governments, ICT, industry, consulting, and academia. The output was an e-government research roadmap; Bolivar, Munoz and Hernandez (2010) also studied the themes and methodologies on E-Government from 321 articles published in Journals from Information Science and Library Science also Public Administration Subjects; Bannister and Connolly (2010) discussed about research topics, trends and types from 544 papers presented on European Conference on E-Government (ECEG) from 2001 to 2009 and others.

This research aims to identify some of this evolving focus of E-Government research activity as well as providing an alternative analysis to complement previous works that examined the changes in E-Government research. We conducted a novel structured literature review to capture and collate together key themes, research philosophies, methodologies and methods of e-Government based on European Conference on E-Government (ECEG) from 2001 to 2012 and International Conference on E-Government (ICEG) from 2007 to 2010.

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Government (ECEG) papers from 2007 to 2012 and International Conference on E-Government (ICEG) papers from 2007 to 2010. Furthermore, 612 papers were analysed focusing on the keywords and paper abstracts.

Hence, this paper make contribution by providing both an update evaluation on e-government research activity and a complementary evaluation to previous works that tried to do the same thing. This paper focuses on evolving themes, trends, philosophy, methodologies and methods used in research within the e-government domain. Those illustrate e-government is a dynamic and becoming mature as a discipline. However, the review results show lack of theory development in this field. This paper also contributes a method for conducting literature review, especially on e-government.

Therefore, this paper has implication for researchers as a reference for conducting research in e-government area, especially to understand research opportunities, identifying themes, core issues, research philosophies and methodologies. The structure of this paper will be Introduction, Research methods, Previous Research, Findings and Analysis, Conclusion, Acknowledgement and References.

This paper is structures as follows. First, we capture introduction, then research methods, previous research, findings and analysis, discussion and finally we draw conclusions.

2. Research Methods

This section describes the methods used in this literature review. Figure 1 below illustrates the flow of research methods and will be explained in more details below:

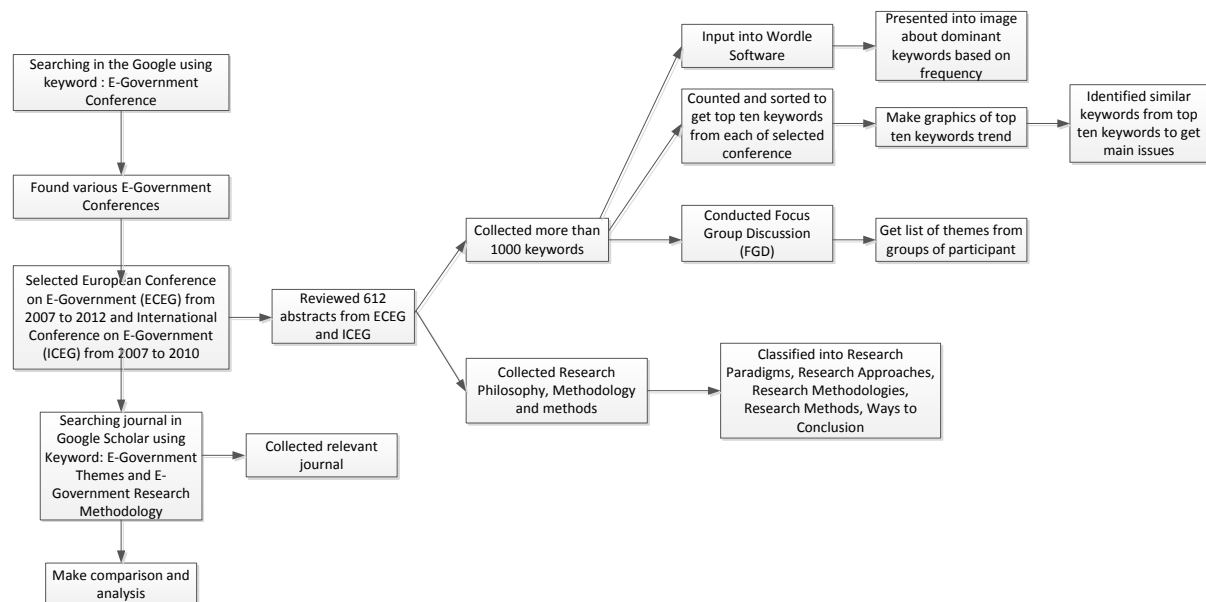


Figure 1: Flow of literature review method

Firstly, we searched e-government conferences in Google Search Engine. Conferences are important as public sources to get to get update about E-Government development and project activities. Therefore, conference provides snapshot about E-Government activities. Then, we found some conferences, such as (Yusuf, Adams and Dingley, 2014):

- ECEG organized by Academic Conferences and Publishing International Limited (ACPI)
- ICEG organized by 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 WASET.

Secondly, we focused on the ECEG and the ICEG. Both conferences are organized by Academic Conferences and Publishing International Limited (ACPI). Those conferences were selected for some reasons: the ECEG was the first conference focus on E-Government in Europe since 2001 and held regularly every year until now (Bannister and Connolly, 2010). Furthermore, the ICEG has been held since 2005 until now. Hence, ECEG is the longest and most established E-Government conference and ICEG is one of the main conferences capturing E-government in the world. Both conferences also represent academic and practitioners perspectives who involved in E-Government activities. The authors of those conferences' papers came from countries around the world and all continents; therefore they represent discussion about E-Government issues around the world (Yusuf, Adams and Dingley, 2014).

Other justifications are both listed in the Thomson Reuters ISI Index to Scientific and Technical Proceedings (ISTP), listed in the Thomson Reuters ISI Index to Scientific and Technical Proceedings (ISTP/ISI Proceedings), listed in the Thomson Reuters ISI Index to Social Sciences & Humanities Proceedings (ISSHP), listed in the Thomson Reuters ISI Index to Social Sciences & Humanities Proceedings (ISSHP/ISI Proceedings) (International Conference on E-Government, 2010) (European Conference on E-Government, 2012). ECEG indexed by the Institution of Engineering and Technology in the UK, Ranked B in the Australian CORE listings, listed in the EBSCO database of Conference Proceedings, Ranked C in the Australian Research Council ERA Conference List and Indexed by Google Books and Google Scholar (European Conference on E-Government, 2012).

Some good papers from ICEG and ECEG will published in the Electronic 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, listed in ProQuest database and indexed by the Institution of Engineering and Technology in the UK (European Conference on E-Government, 2012) Therefore, those indexes above indicate that both conferences have good quality and feasible to be selected.

We focus on ECEG from 2007 to 2012 since this literature review was conducted at 2013. Therefore, ECEG papers on later years are not included. Moreover, the ICEG was not held at 2011 and 2012 (International Conference on E-Government, 2010). Therefore, we only focused on ICEG papers from 2007 to 2010. The papers' abstracts from ICEG 2007 to 2012 were selected for review since some papers have been covered E-Government issues before 2007 and limited papers covered the issues from 2007 to 2012.

Following this, we reviewed 612 abstracts and collected all the keywords and collated them into a list. More than 1000 keywords were collected from all the abstracts of both selected conferences. The keywords represent the core issues in the papers which written by the papers' authors, therefore it provides a robust dataset. Then, the words were entered into Wordle cloud software to help identify the dominant words based on frequency. In the output image, bigger size keywords indicated larger frequency of keywords. (Yusuf & Adams, 2014)

Then, we sorted, counted the keywords and selected the top ten keywords based on the highest numbers. The keyword "E-Government" had the highest number, but it was ignored since this literature review was identified the main issues in E-Government. After that, we created graphics which described trends of keywords every year. Additionally, a diagram was created to show the core issues in E-Government.

Moreover, a Focus Group Discussion (FGD) was conducted in order to get themes based on participants' perspectives about E-Government and their justification. FGD was chosen as commonly used in social

constructivist research and qualitative methodology. In the FGD, participants were divided into 4 groups and asked to classify all the keywords into groups and gave themes for each classification. They then discussed the reasons why they grouped the keywords and wrote the themes. The FGD's participants came from various backgrounds and levels of knowledge about computing technology, public management, politics, government, education, health, finance as they relate to E-Government. They also have expertise, or are conducting research into the following areas (Yusuf & Adams, 2014):

- E-Government from Computer Science & Information Systems
- E-Government from Public Administration
- E-Government from Marketing and Communications
- E-Government from Management Sciences
- E-Government from Library and Information Sciences
- E-Government from Public and Policy Sciences
- E-Government from Accounting, Business and Economics.
- Practitioners on Government (Education/Finance/Health)
- Citizens

Participants also came from International people such as Indonesia, Ghana, Kurdistan of Iraq, China, UK, Libya, etc as well as they have various first language. Some of participants did not use English as their first language. It may influence their perceptions and perspectives about the keywords. Therefore, the participants represents mixed group of people, perspectives and perceptions. As part of the ethics procedure, participants of the FGD wrote and signed consent form before they started the process of FGD.

Then, we analysed the literature review results from both selected conferences and the FGD results. The analysis captured relationship top ten keywords and titles from the FGD

Furthermore, all the abstracts from both selected conferences were reviewed, and then we collected and counted philosophies, methodologies and methods used by the papers authors were. Some papers have clearly stated methodologies and methods presented in the abstracts but some others are not clearly stated. Therefore, unclear methodologies and methods were classified as Not Clear Stated. For instance, the paper's authors only wrote countries where the research done without stated clearly that it is a case study. So that, those papers classified as a case study and potential case study researches. After that, we categorised those into Research Paradigms, Research Approaches, Research Methodologies, Research Methods, Way to conclusion and other. Other category refers to Not Clear Stated (Yusuf, Adams and Dingley, 2014).

Next step, the results were presented through graphics of research methodologies and research methods of ICEG from 2007 to 2010 and ECEG from 2007 to 2012 as well as the top ten of methodologies and methods of ICEG from 2007 to 2010 and ECEG from 2007 to 2012. This has resulted in aspects such as research paradigms, way to conclusion and other categories not being presented as graphics since the number of those classifications are quite small (Yusuf, Adams and Dingley, 2014).

Finally, we collected some journals on same topic about themes and research methodology on E-Government, made comparison and analysis with those previous journal. Those journals used to validate the results of our literature review based on ECEG from 2007 to 2012 and ICEG from 2007 to 2010.

3. Previous Research

This section examines previous works that focussed on themes of E-Government research activity. Siau and Long (2005) proposed the five stage model of E-Government using a qualitative meta-synthesis approach to integrate different E-Government stage models into a synthesized one. This model provides a synthesized conceptual framework for researchers and practitioners to evaluate e-Government development. Case studies or action research was suggested to understand how to implement E-Government successfully.

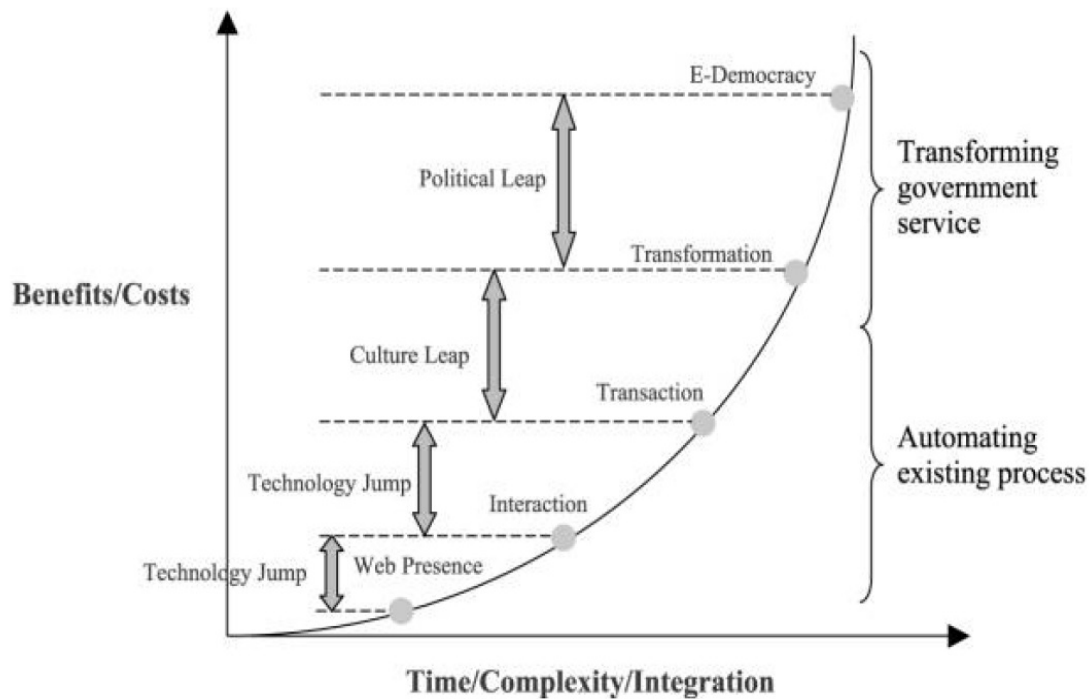


Figure 2: Five-stage model of E-Government (Siau and Long, 2005)

Moreover, Irani, Love and Montezami (2007) summarised some issues of E-Government from various references: looking at remote voting systems, measurement of E-Government functions, E-Government trajectories and the impact of electronic reverse auctions, and their impact on procurement.

Furthermore, Yildiz (2007) argued about the limitations of the E-Government concept including : no standard definition of the concept, the way the term is interpreted by different interest groups and the issue that ambiguous, poorly defined and/or context-dependent rhetoric, contains more hype and promotional efforts than aspects of change to meet the E-Government agenda. Therefore, Yildiz (2007) suggested two points which were classified into topical suggestions, such as: policy processes and the political nature of E-Government as well as methodological suggestions about looking at the topic from output to process.

While Heeks and Bailure (2007) did literature review, they did not find any concepts about research philosophy. Many researchers did not examine a research philosophy regarding E-Government research. Most methods were unclear and had a poor epistemology as well as a mix of deductive or inductive approaches. Additionally, just few papers had clear position as pure positivist, some papers tend towards an unclear positivist approach but there were not papers from social constructivist viewpoint. The analysis showed there was a dominant research philosophy from one philosophic approach. Overall, further studies about research philosophy in E-government are needed to make E-Government stronger as a discipline. They also found knowledge frameworks such as theory-based work, framework-based work, model-based work, schema-based work, concept-based work, category-based work, non framework-based work. The highest numbers of papers were model based-work and the lowest number papers were theory-based work. They summarize various research methods used by E-Government researchers and the results are: No discernible method (20 papers), Hunt and peck (19 papers), Questionnaire (15 papers), Document analysis (14 papers), Interview (14 papers), Web Content evaluation (7 papers), Literature Review (6 papers), Reflection on project experience (6 papers), Observation (3 papers) and others (7 papers). The results describe limited methods used in E-Government research. Those results will be compared with our literature review results. It will be interesting to get update about the changes happened in the E-Government methods (Heeks and Bailure, 2007).

Moreover, Bertot, Jaeger and McClure (2008) summarised area of citizen centred E-Government Research from various papers into some points:

- Needs, Abilities and Expectations
- Literacy
- Community Engagement and Partnerships

- Usability, Functionality, and Accessibility

Wimmer, Codagnone and Janssen (2008) identified 13 themes in eGovRTD2020 project which is funded by European Commission. The 13 research themes are interrelated to each other and the multidisciplinary field. Those themes are:

- Trust in E-Government
- Semantic and cultural interoperability of public services
- Information quality
- Assessing the value of government ICT investment
- eParticipation, citizen engagement and democratic processes
- Mission-oriented goals and performance management
- Cyber infrastructures for e-Government
- Ontologies and intelligent information and knowledge management
- Governance of public-private-civic sector relationships
- Government's role in the virtual world
- Crossing borders and the need for governance capabilities
- E-Government in the context of socio-demographic change
- Data privacy and personal identity

Bolivar, Munoz and Hernandez (2010) did literature review and found different research themes in E-Government, such as:

- Technological innovation and modernization in public administration management,
- E-Government programme/project evaluation and policy analysis,
- E- Participation and digital democracy,
- E-Services,
- Accountability, transparency and dissemination of information,
- Behaviour of citizens in relation to the applications of E-Government,
- E-Government and personnel/human resources,
- legislative architecture,
- intergovernmental relations,
- digital divide and resistance barriers to E-Government,
- Organizational theory and behaviour.

They also found methodologies used in E-Government as varied as:

- action Research,
- case studies,
- content analysis,
- comparative analysis,
- critical incident technique,
- chi-Square method,
- ethnographic studies,
- evaluation research,
- factorial analysis,
- feasibility studies,

- hermeneutic exploration,
- holistic approach,
- heuristic approach,
- informetric studies,
- life history method,
- longitudinal design,
- marketing technique,
- non-empirical,
- normative approach,
- regression analysis,
- scene evaluation,
- social network analysis,
- Structural equation model.

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 (Bolívar, Muñoz and Hernández, 2010).

Bannister and Connolly (2010) reviewed and found the following topics, such as: National, Evaluation, E-Democracy, Local Government, Interoperability, E-Voting, E-Participation, Identity, E-Procurement, and Website. The most popular topic is National evaluation which described the state of E-Government or some aspect of E-Government in specific countries. Furthermore, the types of each topic are varied; therefore there is not clear trend. They also found various types of papers include conceptual, investigative, case, theoretical, methodological and technical approaches. The dominant type is case studies. Additionally, they classified papers into type and sub type, and then found these results: Concept/Concept, Investigative/Analytic, Case/Concept, Case/Descriptive, Case/Discussion, and Theoretical/Theoretical which Concept/Concept is the most dominant type and sub type. The study showed that investigative and numerical research papers increased, while conceptual research decreased. Also, they found E-Government research tends toward analytical and investigative research.

4. Findings and Analysis

This section captures literature review findings and analysis regarding those results. We will explain more details below.

5. Themes in E-Government

Based on our literature review of abstracts of ECEG from 2007 to 2012 and ICEG from 2007 to 2010, some themes emerge as explained more details below:

Figure 3 and 4 below describe the keywords which were processed through Wordle software. In the figure below, there are some dominant keywords which are public, management, eGovernment, Government, information, and others which demonstrated that these words were used frequently in the ECEG from 2007 to 2012. Therefore, those dominant keywords show that authors of papers in the ECEG 2014 using those keywords in many papers. (Yusuf & Adams, 2014). Additionally, the figure below shows that some keywords such as E-Government, Public, Information, Digital, Government, and others are also dominant in papers of ICEG from 2007 to 2010. (Yusuf & Adams, 2014)



Figure 3: Keywords of ECEG from 2007 to 2012 presented by Wordle (Yusuf & Adams, 2014)



Figure 4: Keywords of ICEG from 2007 to 2010 presented by Wordle(Yusuf & Adams, 2014)

The issue with E-Government is that it encompasses many different aspects and papers cover these diverse issues, creating a wide variety of relevant keywords.

Furthermore, the authors classified the top ten keywords based on frequency. Figure 4 and 5 below illustrate the top ten keywords which emerged from both selected conferences papers. In the ICEG papers from 2007 to 2010, the top ten keywords are E-Democracy, E-Governance, E-Commerce, E-Participation, Governance, and E-Government implementation, Public Sector, E-Voting, Public Policy and Transparency.

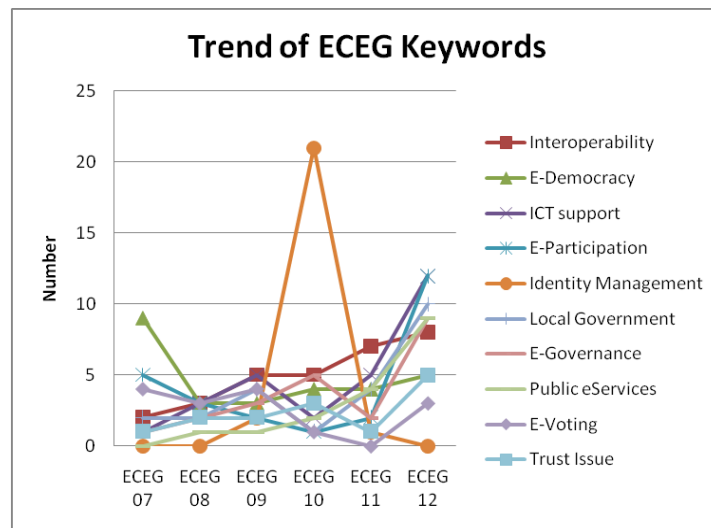


Figure 5: Top ten keywords of ECEG from 2007 to 2012 (Yusuf & Adams, 2014)

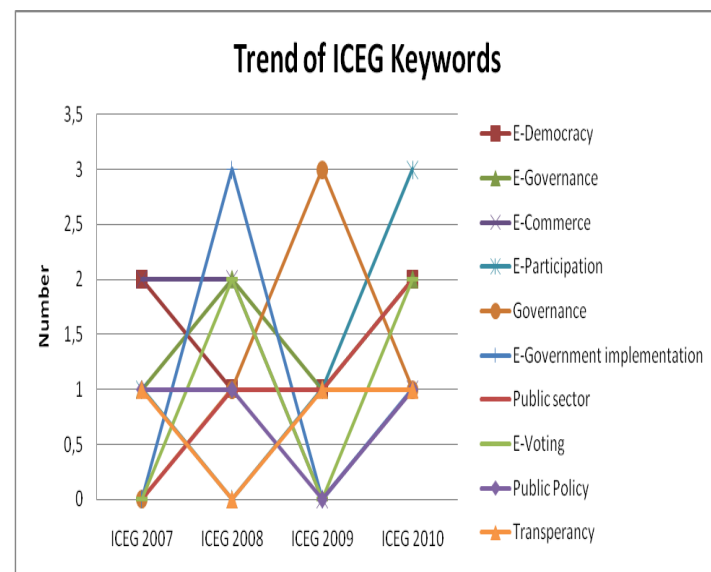


Figure 6: Top ten keywords based on ICEG from 2007 to 2010 (Yusuf & Adams, 2014)

Also, the emerged top ten keywords from the ECEG 2007 to 2012 are Interoperability, E-Democracy, ICT Support, E-Participation, Identity Management, Local Government, E-Governance, Public eServices, E-Voting and Trust Issue. The trend of those keywords varies as shown in the figure 5 and 6 above. (Yusuf & Adams, 2014)

There are 4 keywords which are the same in the top ten keywords of both conferences, as follows: E-Democracy, E-Participation, E-Voting and E-Governance. However, the rest of the keywords are different, such as : Local Government, Public Sector, Public Policy, Interoperability, ICT Support, E-Government implementation, Transparency, Public eServices, Governance, Trust Issues, E-Commerce and Identity Management. Therefore, the authors assumed that those four keywords are the core issues in E-Government Activity as described in the diagram below (Yusuf & Adams, 2014).

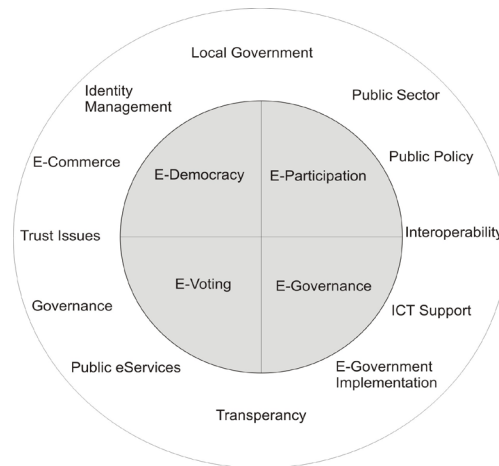


Figure 7: Main Issues on E-Government Research based on ICEG 2007 to 2010 and ECEG 2007 to 2012 (Yusuf & Adams, 2014)

We also conducted FGD to validate the keyword's classification. The participants were divided into 4 groups and they wrote various themes as shown in the table 1 below.

Table 1: List of Title based on Group Subject of FGD (Yusuf & Adams, 2014)

Group A	Group B	Group C	Group D
Citizen	Countries	E-Government	Regional
Security	Finance	Policy	Actors
Countries	People Usability Accessibility	Democracy	E-Services
Standards and Policies	E-Government	Tools-Technology	Management
E-Government Transactions	Abbreviations	Tools-Design	Research
E-Government Activities	Ambiguous	Tools-Research	Information
Legal	Health	Tools-Practice	Technology-Usability
Technology	Bug wards	Structure-Information Needs	Technology-Security
Taxation	IT Service Related	Culture	Technology
Government Services	Future	Public Management	Legal
E-Government Portal	Research Methods + Themes	Concepts	Education
Management	Management	Communication	Economics Finance
Election	Issues		E-Governance
Characteristics of E- Government	Public		Politics
			Unclassified
			Jargon

The diagram in the figure 7 above shows the result from the quantitative process and table 1 above is the result from qualitative process. E-Governance is the only similar word from both classification, however some other titles are related to the issue in the diagram, such as Democracy and Politics related to E-Democracy, Citizen related to E-Participation, Public Management related to Public Services and Public Sector, Technology related to ICT Supports. Therefore, the various titles in the FGD table are fundamentally same with numerous keywords. Those things are interrelated each others. Both classification results also indicated that E-Government issues consist of technological issues and non-technological issues.

6. Research Methodologies and Methods on E-Government

In this section, we present a classification of research philosophy and methodologies in the E-Government area. The collected data will be classified into research paradigms, research approaches, research methodologies, research methods, demonstrate conclusion and others. Table 2 and 3 below illustrate methodologies and methods of the ECEG papers from 2007 to 2012 and the ICEG papers from 2007 to 2010.

Table 2: Methodologies and Methods from ECEG 2007 to 2012 (Yusuf, Adams and Dingley, 2014)

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 and potential 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
	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 correlation 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 3: Methodologies and methods from ICEG 2007 to 2010 (Yusuf, Adams and Dingley, 2014)

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 and potential case study	94
	Usability Research	1
	Complex Thinking Theory	1
	Comparative Approach	1
Research Methods	Questionnaire	7
	Survey	13
	Extensive review of literature review	4
	Government Documents	2
	Research Reports	1
	Observation	1
	Browsing	1
	Comprehensive Content Analysis	1
	Desk Research	1
	Interview	7
	In-Depth Interviews	1
	Intensive review of literature review	4
	Telephone Interview	1
	Dialogues/circles	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
	Correlation Research	1
Way to conclusion	Inductive	1
Others	Not Clear Stated	36

Table 2 and 3 above shows that research paradigms on the E-Government domain are interpretative and critical realist. Research approaches include qualitative, quantitative and mixed methods. In those

conferences, the quantitative approach was stated as quantitative, quantitative empirical or empirical quantitative as well as mixed method stated as Qualitative-Quantitative and Qualitative-Quantitative empirical. Both tables above also demonstrate that case study and potential case study approaches as well as survey are dominant methods. Some of the papers authors did not states clearly that they used case study, but they only wrote place or country where their research was done. Therefore, those papers are categorised as case study and potential case study research papers. A lot of authors did not state what methodologies or methods which they used; hence those grouped as Not Clear Stated.

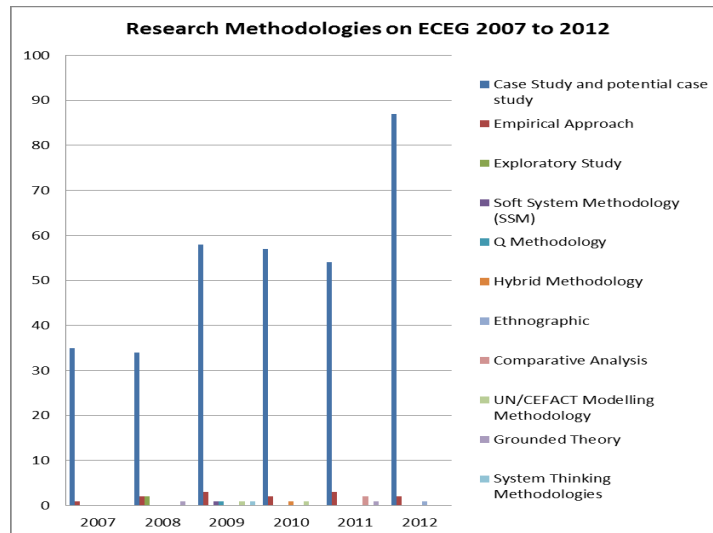


Figure 8: Trend of Research Methodologies on ECEG from 2007 to 2012 (Yusuf, Adams and Dingley, 2014)

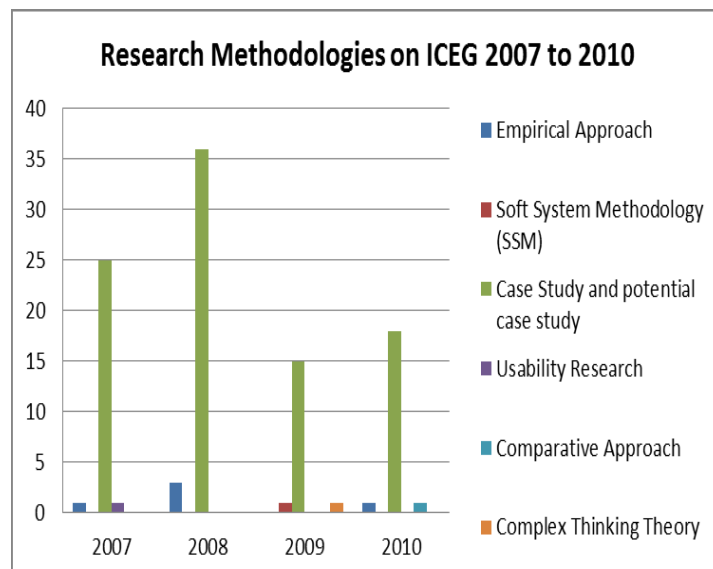


Figure 9: Trend of Research Methodologies on ICEG 2007 to 2010 (Yusuf, Adams and Dingley, 2014)

Figure 8 and 9 above illustrates research methodologies used from the ECEG 2007 from 2012 and the ICEG 2007 to 2010. The Y axis refers to number of papers and the X axis refers to the year of the conference. The 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 that the case study and potential case study is the most popular of research methodology.

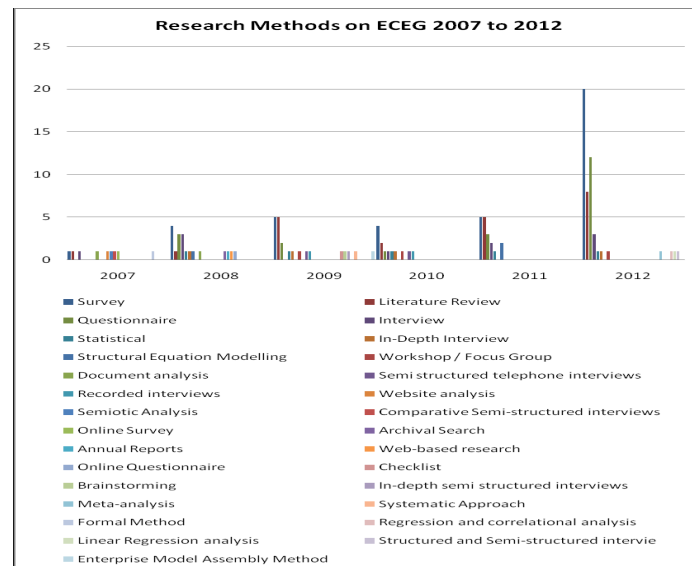


Figure 10: Trend of Research Methods on ECEG from 2007 to 2012 (Yusuf, Adams and Dingley, 2014)

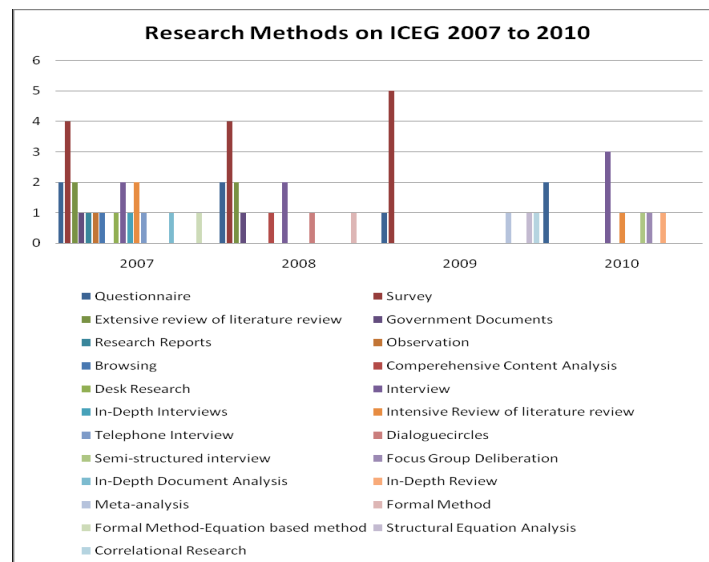


Figure 11: Trend of Research Methods on ICEG from 2007 to 2010 (Yusuf, Adams and Dingley, 2014)

Figure 10 and 11 above illustrate ranges of research methods used from the ECEG 2007 to 2012 and ICEG from 2007 to 2010. The Y axis refers to the number of papers and the X axis refers to the year of the conference. There are many methods used in E-Government paper from Desk research to empirical research as well as quantitative to qualitative. Survey appears to be the dominant method in ECEG 2012 and ICEG 2007 to 2009.

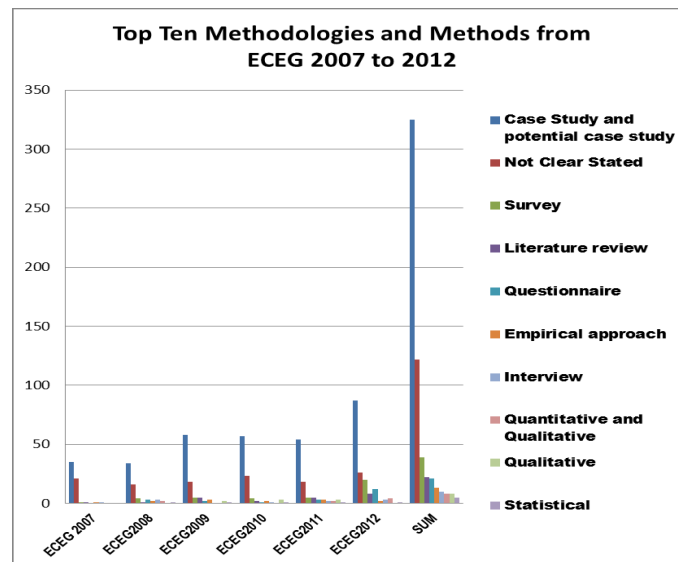


Figure 12: Top Ten Methodologies and methods of ECEG from 2007 to 2012 (Yusuf, Adams and Dingley, 2014)

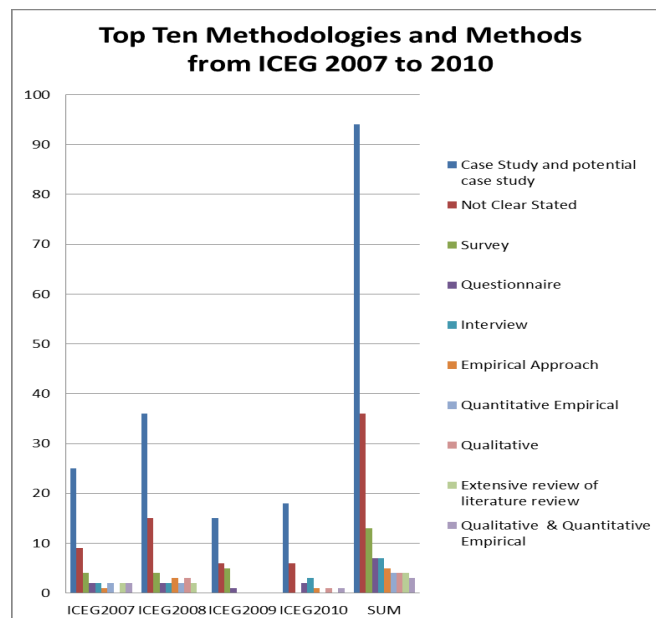


Figure 13: Top Ten Methodologies and Methods of ICEG from 2007 to 2012 (Yusuf, Adams and Dingley, 2014)

Figure 12 and 13 above illustrate the top ten methodologies and methods used by the authors of papers in ECEG from 2007 to 2012 and ICEG from 2007 to 2010. There are similar trends, such as case study and potential case study are the most popular and are the most frequently method used in each year. The second most frequently method is Not Clear stated. Both figures also point out various methods such as survey, Questionnaire, Interview, Empirical Approach and Literature review or an Extensive Literature Review.

7. Discussion

This section provides discussion based on findings above. There are some important points from the previous researches and our focussed literature review which will be discussed below.

First, the research of Bolivar, Munoz and Hernandez (2010), Bannister and Connolly (2010) as well as our focussed literature review have same result that case study research is the dominant method. There are some reasons that case study is the most popular research methodology. In this paper, we combine case study and potential case study. First, case study captures richness and depth understanding about E-Government practicalities in particular context, environment, country and place. Each context has own challenges. It happens because of numerous complex factors, such as social, politics, economics, legal, culture and other which influenced E-Government implementation in various context. Therefore, generalisation for different

context may not be suitable for E-Government implementations and rich case study research may not be generalizable. Second, case studies also have very specific focus, not applicable elsewhere, such as:

- Why particular E-Government technologies successfully implemented in particular context but failed in other contexts?
- What kinds of factors influencing successful or failure of E-Government implementation in a particular context?
- In addition, there are some interesting discussion points as following:
- Do we need more case study research since many case studies have been done?
- Should we start collating together the body of work embedded with these case studies, identify characteristics for building general models which applies to a new context?
- How to collate together many previous case studies research and get the general model based on different characteristics and contexts?
- How to apply the general model into a new context?
- Would the underlying philosophical standing of the previous research be changed or compromised if they were collated together?
- What is the suitable philosophical standing for collating together existing case studies?

Second, the research of Heeks and Bailure (2007), Bolivar, Munoz and Hernandez (2010) and our literature review shows that there is a diversity of philosophy, methodology and methods in the E-Government field. E-Government is interdisciplinary where every discipline has its own philosophical standing, methodology, and methods. Each methodology and method has advantages as well as limitations. Those diversities make significant contribution and enrichment to develop E-Government as a mature discipline. Also, there are some dominant methodologies and methods, but it does not mean the other methodologies and methods are less important and useless.

Third, our literature reviews and other works, such as Siau and Long (2005), Irani, Love and Montezami (2007), Yildiz (2007), Heeks and Bailure (2008), Bertot, Jaeger and McClure (2008) Wimmer et al (2008), Bannister and Connolly (2010) themes and research methodology describe how E-Government evolving as discipline.

Fourth, Heeks and Bailure (2007), Bannister and Connolly (2010) and our focussed literature review identified there is a lack of theory development in E-Government area. However, variety of different theories can be used in researching E-Government (Heeks & Bailure, 2007). Therefore, Researches on developing, testing and applying theory are needed to develop E-Government as a discipline. Theory of E-Government can be taken from other related disciplines such as Politics, Sociology, Computing, Information System, Public Management, Economics and others, or mixed the theories from those interdisciplinary.

Fifth, there are a large number of E-Government references which are dispersed in the books, journal, conference papers, databases, etc; therefore good repeatable methods are needed to do reviews of those many references. Previously, Webster and Watson (2002) recommended some steps to do a literature review as follows:

- Start by choosing leading journals in the topic area
- Go backward by reviewing citations for the articles to decide which article should be chosen
- Go forward by using Web of Science to identify articles citing the key articles identified in the previous step.

Webster and Watson (2002) also explained that there are two approaches to do literature reviews, which are include Concept-Centric and Author Centric. Concept Matrix means literature review based on the concept and found some authors. In contrast, Author centric means literature review based on author and found some concepts per author. Then, it is necessary to compile the result using Concept-Matrix and adding unit analysis into the Concept-matrix. For example, DeLone and McLean (1992) include a set of tables summarizing the literature on IS by level of analysis, type of study and success measures.

Thus, the structured literature review method in this paper can be an option of method, especially in E-Government references. There are strong points from the methods as following:

- Based on one of the most established conferences on E-Government (ECEG) and a good conference on E-Government (ICEG) where the participants came from around the world, multi languages, and multi cultures.
- Based on some good journals in same topic about concept, themes, research philosophy and methodology, therefore the result of those journals validated the focussed literature review result from ECEG and ICEG.
- FGD used to validate the results of themes classification and get further analysis about the themes.
- This literature review combines quantitative process and qualitative process.

This literature review method also has limitations as follows:

- Based on the abstracts (not full papers) since the authors wanted to know the trends, themes and research methodologies.
- The journals were only selected from Google Scholar engine. There are other good databases, such as web of knowledge, web of science, EBSCO, Taylor & Francis Online, and other publisher sites.
- This literature review method did not examine papers from other E-Government conferences from other company, for instance: ICEGOV. Therefore, the authors could not generalise the result for all references of E-Government. The results are only based on the selected conferences, journals and time period. Different choice of conference may have different result.
- This literature review did not capture all ECEG and ICEG proceedings, such as ECEG before 2007, ECEG 2013 and ECEG 2014 and ICEG before 2007.

Indeed, there are changes in themes, research philosophies and methodologies over time and it illustrates that E-Government is a dynamic domain and evolving to be mature as discipline.

8. Conclusions

In this section, we have conclusions from our research as explained below. In Summary, this research shows some points such as case study and potential case study research is dominant, diversity on research philosophy, methodology and methods in E-Government domain, also E-Government is evolving over time and becoming mature as discipline.

Theory development in E-Government is needed by adding and combining existing theories from other disciplines such as Politics, Sociology, Computing, Information System, Economics, Public Management and others.

Our structured literature review based on selected conferences shows that top ten keywords in ICEG papers from 2007 to 2010 are: (1) E-Democracy, (2) E-Governance, (3) E-Commerce, (4) E-Participation, (5) Governance, (6) E-Government implementation, (7) Public Sector, (8) E-Voting, (9) Public Policy, (10) Transparency. Top ten keywords of ECEG papers from 2007 to 2012 are: (1) Interoperability, (2) E-Democracy, (3) ICT Support, (4) E-Participation, (5) Local government, (6) E-Governance, (7) Identity Management, (8) Public eServices, (9) E-Voting, (10) Trust Issue. Furthermore, the top ten methodologies from 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 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.

There are various research paradigm, research approach, research methodologies, research methods and ways to reach conclusions used by researchers from the ECEG 2007 to 2012 and the ICEG 2007 to 2010. The research paradigms include Interpretative and critical realist approaches. This paper also shows qualitative, pure quantitative and mixed method as research approaches. Overall, case study and potential case study as well as survey are the dominant methods used by E-Government researchers.

This paper also has contribution and novelties by providing the structured literature review method. It also provides an example for 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.

The summary above illustrate that there are changes in E-Government domain including research philosophy and methodologies. E-Government has also grown and matured as a discipline since researchers used various research philosophies and methodologies in this domain,

In the future, it seems interesting to do research on theory development in E-Government since it is still very limited, especially in the specific areas, such as E-Participation, E-Voting, E-Democracy, E-Governance, and others.

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