E-Government Systems Design and Implementation in Developed and Developing Countries: Results from a Qualitative Analysis

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Abstract. Developing countries continue to rely on solutions and research from developed countries as they strive for more successful e-government endeavours. Different authors argue that the transfer of solutions and expertise among developed and developing countries is not a straightforward task and the context of countries is a significant influencing factor. This paper investigates and compares e-government design and implementation approaches in developed and developing countries. Along the qualitative analysis, differences and similarities in the approaches are highlighted, and recommendations are brought forward. The paper adds value to current e-government developments, particularly in developing countries, by eliciting approaches applied in developed countries and their impacts to more successful e-government implementation.

Keywords: E-government design and implementation · Developed countries · Developing countries · Qualitative analysis

1   Introduction

The last United Nations (UN) e-government survey reveals that governments in developing countries have recognisably advanced in the area [14]. The contribution of mobile phones and technologies is highly acknowledged in such advancements, particularly in the provision and adoption of online public services by governments and citizens [9, 14]. To support developing countries in keeping pace with the innovations and developments of e-government and in realising more successful e-government implementation, the sharing and transfer of expertise, experiences, design approaches and solutions among developed and developing countries is crucial. However, a direct transfer of solutions is cautioned in literature because a country's context is not necessarily reflected in system designs [5]. Also, contextual factors of countries such as culture, infrastructure, economic growth and ICT capabilities ought to be considered when transferring solutions [2]. Sæbø points out that knowledge of e-government in developing countries, is "mainly based on research in developed countries" [12].

Following these arguments, this paper has two objectives to bridging the gap between developed and developing countries: (1) to investigate and compare e-government design

and implementation approaches in developed and developing countries along differ-ences, similarities and their impacts; and (2) to bring forward recommendations for more successful implementation of e-government endeavours in developing countries based on findings of (1). The term 'e-government approaches' is used throughout the paper in a general manner to incorporate methods of analysis, design, implementation and evalu-ation as well as overall frameworks (for distinct purposes such as strategic, legal, man-agement, architecture, interoperability, technological development or evaluation) that are employed by governments to support better achievement of the envisaged objectives. The primary focus of study is the national level, and the research is guided by a strategic framework for e-government implementation as put forward in [7]. Practitioners of e-government - particularly of developing countries – can benefit from the insights and lessons of the qualitative analysis and from the recommendations put forward to suc-cessfully implement e-government.

The remainder of the paper is as follows: Sect. 2 presents the research design and methods used, followed by the analysis and comparison of approaches of e-government design and implementation employed in different countries (Sect. 3). Recommenda-tions derived from the data analysis are synthesised in Sect. 4. In Sect. 5, we conclude with suggestions for future research.

2   Research Design

Comparing approaches of e-government design and implementation in developed and developing countries is grounded in qualitative research. This is because the objectives are not particularly geared towards generalisation and representativeness of samples in empirical research, which are among the key features of quantitative approaches [4, 10]. A qualitative approach is also selected because of its relatively smaller sample in which the researcher acquires a comprehensive overview of different contexts to draw conclusions rather than statistical measures of results ([10], p. 259). Based on the objectives, interviews and desk research were selected as research methods. The design of the interviews and the systematic analysis of literature through desk research were guided by the framework for strategic design of e-government suggested in [7]. The framework helped to identify the areas of investigation deemed important to e-government design and implementation at national level.

The strategic framework for designing e-government in [7] compares nine e-government approaches identified in literature and proposes five core activities of e-government implementation to better achieve the overall objectives: (1) developing a vision, (2) developing a strategy, (3) introducing programmes for implementing the strategy, (4) running concrete projects, and (5) evaluating the achievements of projects towards strategy and vision. The framework emphasises a clear relationship and feed-back loop among the activities so policy makers are able to evaluate the achievement of objectives of each activity by the subsequent activity. Further literature review revealed the significance of e-government sustainability [1, 3, 6] as a key principle of strategic design of e-government. Accordingly, the principle is investigated in this paper, too.

The interview protocol consisted of 30 questions (mix of open and closed), which were grouped into six parts (A – F) grounded on the strategic framework for designing

e-government. Part A consisted of demographic questions. Part B collected information about the existence of a vision and strategy in a country. Part C investigated the presence of programmes (see [7] for a definition of 'programmes') that support the implementation of the strategy. The purpose of part D was to find out what approaches countries employed for successfully implementing e-government projects. This part investigated aspects such as criteria for selection of projects, interoperability and development methods. Part E investigated evaluation and sustainability approaches. Part F inquired recommendations for successful implementation of e-government.

The interviews were conducted in person (at the IFIP EGOV conference in 2013) and via VoIP technologies to reach experts beyond the conference in developed and developing countries in the time span of end 2013 - mid 2014. The experts were selected from the pool of contacts of the authors – one per country, with a balance among developed and developing countries. The interviews took 40–60 min to allow in-depth interrogation. The transcribed interviews were sent to the interviewees for accuracy and additional comments. The authors ensured that the responses were recorded and verified to ensure accuracy and reliability of the findings as is suggested by Riege [11]. Data obtained from the interviews was analysed qualitatively to search for patterns, similarities and differences in the approaches.

Desk research was conducted in parallel to the interviews to triangulate and validate data collected from the interviews. The authors sought official documentations such as e-government strategies, interoperability frameworks and architectures and evaluation frameworks, and evaluated the suitability of documents with the interviewees so to address drawbacks of desk research such as access restrictions or lack of control over data quality (see [8, 13] for more details).

3   Analysis of e-Government Approaches in Developed and Developing Countries

3.1   Sample Selection and Demographic Information of Experts

The authors aimed at interviewing at minimum one person per country and at investigating a reasonable set of countries. A good balance of interviews from developed vs. developing counties was aimed at, with a minimum of five interviews per country group. However, the selection of countries was challenging because the interview required participants who are knowledgeable of e-government endeavours in their countries at the national level and that the interviewees bring 40–60 min of their time. These aspects presented a significant geographical constraint to approach the 'right and willing' participants. The candidates were selected from the pool of contacts in the e-government networks they are involved.

In total, 20 experts from developed and 21 from developing countries were approached. The developed countries are Australia, Austria, Czech Republic, Canada, United States of America, Denmark, Sweden, Malta, Saudi Arabia, United Kingdom, Germany, Netherlands, Russia, Singapore, South Korea, Japan, Finland, Greece, Norway and Poland. Eleven experts agreed to be and were interviewed.

The developing countries are Tunisia, Turkey, Sri Lanka, China, India, Kazakhstan, Mexico, Georgia, Lebanon, Jordan, Afghanistan, Brazil, Kenya, Egypt, Uganda, South Africa, Nigeria, Gabon, Ghana, Malawi and Rwanda. Seven experts agreed to be and were interviewed. Table 1 presents the demographic information of the interviewees.

Table 1. Interviewees' demographic information (part A of questionnaire)

	Country (country code)	Domain of work	Research discipline/ thematic background	Years of experience
	Developed countries			
1.	Austria (AT)	Public sector	E-Government	>15
2.	Canada (CA)	Public sector	E-Government	18
3.	Denmark (DK)	Public Sector	E-Government	10
4.	Germany (DE)	Academia and public sector	Information systems	10
5.	Malta (MT)	Public sector	Computer science	20
6.	The Netherlands (NL)	Academia	E-Government	12
7.	Russia (RU)	Academia	E-Government	5
8.	Saudi Arabia (SA)	Academia and public sector	E-Government	6
9.	Sweden (SE)	Public sector	E-Government	5
10.	Switzerland (CH)	Academia and public sector	E-Government, Computer science	5
11.	United Kingdom (UK)	Public sector	E-Government, E-Participation	13
	Developing countries			
1.	Egypt (EG)	Public sector	E-Government	12
2.	Georgia (GE)	Public sector	Jurisprudence and E-Government	5
3.	Lebanon (LB)	Academia and public Sector	Computer science	7
4.	Malawi (MW)	Academia	Information systems	5
5.	Mexico (MX)	Academia	Public administration	12
6.	Nigeria (NG)	Public sector	E-Government	6
7.	Tunisia (TN)	Public sector	Public administration	5

3.2   Analysis of Results Along the Interview Protocol, Parts B - E

The results are presented along the five activities suggested in the strategic framework for e-government of [7], with the addition of sustainability (along evaluation). The italic entries with *Q:* correspond to the interview questions.

Part B: Vision and Strategy Formulation
Q: Is there an e-government vision and strategy at the national level?
   10 out of 11 experts of developed countries and 6 out of 7 experts from developing countries confirmed the existence of a vision and strategy at the national level. In CA, the Digital Canada 150 was published in April 2014, which was after the interview, i.e. today, all 11 developed countries where we conducted interviews have a vision and strategy in place at national level. However, the respondent of CA stated that lacking a strategy at the national level led to the absence of a standardised approach and to non-exploitation of synergies across the country to implement e-government projects, which also led to high costs. The respondent argued further that solutions are not

interoperable due to the lack of a centralised approach. Furthermore, the respondent stated that "*this situation is worse to handle in a federal country because there is no standardised direction in coordinating vertical and horizontal level investments of the government*".

The formulation of a vision and strategy at the national level in NG is an on-going process. General guidelines for e-government implementation exist in ministries, departments and agencies. The respondent stated that the absence of the strategy results in a lack of a standardised approach across the country to implement e-government projects, presence of dismantled programs and projects with objectives that are not necessarily aligned, waste of resources and redundancy of solutions.

Q: Is the implementation of the strategy obligatory, optional but recommended or optional and not recommended to other government levels?

In developed countries, the implementation of the strategies is obligatory in MT, SA, DK and RU and optional but recommended in AT, CH, SE and DE. The implementation in NL and UK includes obligatory and optional but recommended facets depending on aspects addressed by the strategy. Respondents from CH, DE and NL revealed that the high level of autonomy in lower levels of the government contribute to the implementation of the strategies being not entirely obligatory. Respondents from AT, CH and DE also mentioned that the non-obligation is due to the federal structure of the governments. The respondent from AT explained that internal discussions, collaboration and common agreements among the federal government and lower levels of the government improve consistent and coordinated implementation of e-government.

In developing countries, the implementation of the strategy is obligatory in LB and GE, and optional but recommended in TN, MW and EG. The respondent from GE stated that the strategy has a legal force; therefore all government organisations are highly obliged to implement the objectives specified therein. The implementation of the strategy in MX includes obligatory and optional but recommended facets depending on aspects addressed in the strategy. The overall approach of implementing the strategies in TN and EG have been disrupted by political revolutions. For example, the respondent from EG commented that "*after the revolution, the national focus shifted from development aspects, particularly e-government implementation, to the turbulences and security. Therefore at the moment, ministries are not as obligated to implement the strategy as before*".

Q: What impacts does the answer in the previous question have to e-government systems design at national level?

All respondents, regardless if obligatory or optional but recommended, reported that the presence of an e-government strategy at the national level helps to enhance adoption, to ensure political support at the national level and to provide a national framework for implementation of strategic objectives. Table 2 sums up the impacts reported by experts on obligatory and optional but recommended facets of implementing the e-government strategy. As can be noted, the obligatory strategy has more positive impacts on implementing e-government than optional but recommended ones. In AT, where the strategy is optional but recommended, the presence of collaboration, internal discussions and common agreements among different levels of the government strengthen the implementation of effective, efficient and interoperable e-government solutions.

Table 2. Impacts of obligatory vs. optional but recommended e-government strategies

Impacts if obligatory strategy	Impacts if optional but recommended strategy
Cost savings due to a centralised structure of planning and implementing e-government;	Provision of more opportunities for bottom up initiatives that are not necessarily identified by the centralised strategy;
Comprehensive and consistent provision of public services across the country;	Lack of coordination in achieving the objectives of the strategy;
Enhanced assurance that the implementations are directed towards achieving the goals and objectives of the strategy;	Lack of standardised approach towards implementing e-government;
A unified approach towards implementing e-government;	Low cooperation among public sectors at different levels of government particularly in federal countries;
Enhanced coordination and collaboration in achieving the objectives of the strategy	Lack of clear alignment between strategy and projects implemented at different levels of government

Q: How do you ensure the alignment of the objectives of the strategy to the vision?
In 9 out of 10 developed countries and in 4 out of 6 developing countries, mechanisms are in place for ensuring that the objectives of the strategy are aligned to the vision. The following mechanisms were mentioned (with respective country indications):

- The same organisation is responsible to formulate both a vision and a strategy – AT, UK, CH, SE, NL, DE, SA, MT, DK, MX, MW, LB, GE
- Re-evaluation and feedback of how the strategy impacts and realises the vision – AT
- Constant negotiations and communications involving representatives of the government at different levels and use of alignment scenarios – NL

No specific mechanisms exist in RU, TN and EG.

Part C: Programmes Supporting the Implementation of Vision and Strategy
Q: Are there any programmes that support implementation of the strategy?

In 7 out 11 developed countries (AT, NL, SE, SA, MT, DK and RU) and in 4 out of 7 developing countries (TN, LB, EG and GE), respective programmes to implement the e-government vision and strategy are in place.
Q: What is the impact(s) of the presence or absence of the programmes?

Table 3 indicates the impact of the presence or absence of programmes at the national level. Respondents from DE and CA, both federal countries, stressed on the resulting different approaches towards achieving the objectives of the strategy and lack of coordination as the most observed and significant impacts.

Table 3. Results regarding impacts of presence or absence of programmes

Impacts of presence of programmes	Impacts of absence of programmes
Holistic management of projects that they don't exist in silos;	Different approaches towards achieving objectives of the strategy;
Provide an end-to-end of projects to strategy and vision particularly in large scale implementations of the strategy;	Lack of clear alignment of projects to the objectives of the strategy;
Ensure coordination across the country in implementing the strategy;	Uneven distribution of e-government progress, particularly in federal governments;
Create transparency and shared understanding of the development efforts;	Lack of coordination in implementing the projects at national level
Benefits and value are the foci of programmes unlike projects which are often measured by objectives, deliverables and milestones;	
Concrete definition of measures and actions for implementing the strategy including setting of priority themes	

Q: How do you ensure the alignment of the programmes to the strategy?

8 developed countries and 3 developing countries have mechanisms in place for ensuring the alignment. The following mechanisms were named – with country indication:

- The same organisation is responsible for formulating the strategy and for defining the programmes – AT, DK, SE, MT, SA, LB, GE
- Constant communication among stakeholders involved in planning and implementing the programmes – AT, NL
- Top down approach of formulating the programmes by formulating the programmes from the objectives of the strategy – MT, RU
- Demonstrating alignment of programmes to the strategy by indicators – SE, EG

Part D: Implementation Through Projects
Q: How do you ensure the alignment of the projects to the programs?

All developed countries and 3 developing countries mention mechanisms for ensuring the alignment as follows (with respective country-indication):

- Assessment and evaluation of projects by experts based on their business cases to ensure that they are aligned to the programmes – AT, NL, DK, SE, RU, EG
- Presence of the same organisation/committee that formulated the strategy, identified the programmes and selected the projects – SE, AT, DK, MT, SA, LB, GE
- Collaborative meetings and discussions when selecting projects and transparency in implementation of projects – AT
- Presence of an e-government commission, which is responsible for cross-agency cooperation and coordination – GE

Q: Is there an e-government interoperability framework at the national level?

An interoperability framework exists in 9 out of 11 developed countries, except in CA and CH. Among the developing countries, an interoperability framework is in place only in NG (it is currently under review). However, all respondents in developing countries indicated that the development of the framework is on-going. Respondents from LB, MX, EG and GE reported that there are interoperability standards but they are developed in an ad hoc manner and are not institutionalised.

Q: Which challenges have you identified on organisational, legal, semantic and technical interoperability? What possible solutions exist to address these challenges?

A total of 13 challenges – 3 legal, 5 organisational, 2 semantic and 3 technical – were identified by the respondents with proposed solutions (except, CA and SA, where the expert did not provide answers to the question). Due to space limitation, only summaries and not the individual answers are reported here. The presence of legacy systems was identified as a technical challenge in developing countries and not in developed countries. All other challenges were mentioned by respondents from both groups. Respondents argued that legal and organisational challenges are more prominent than semantic and technical challenges because the latter are mostly resolved by high availability of advanced technologies to support semantic and technical interoperability. Legal and organisational interoperability challenges are e.g. grounded in different and long-term social circumstances and organisational structures and the long time required to change legislation compared to advancements made in e-government and innovative ICT. Respondents emphasised that the development of an interoperability framework that addresses the challenges is vital to ensure interoperable e-government solutions. Also, such a framework needs continuous improvement. Adding to this, the respondent from GE stated: "*given the significance of an interoperability framework in implementing e-government, we currently develop the framework with legal obligations attached to it*".

Q: Is there a project development method at the national level? Is the method obligatory, optional but recommended or optional and not recommended to other government levels? What are its objectives?

6 out of 11 developed countries have a project development method in place, which is obligatory in DK, AT, MT and SA and optional but recommended in SE and UK. None of the experts of developing countries reported the existence of a project development method at the national level. Table 4 presents the methods and their objectives mentioned by experts (except by the expert of MT who could not provide details due to confidentiality reasons).

Q: What is the impact of the absence of a project development method at the national level?

Respondents from the countries that have no project development method at the national level pointed out that the impacts of this absence include among others a high fragmentation and heterogeneous solutions, a higher number of solutions that are not interoperable, a duplication of efforts and waste of money, a lack of learning from the projects' results by organisations, a lack of coordination in the development processes and in the use of required infrastructure, an increased uncertainty in the outcomes of the projects, and a lack of proper documentation in place.

Table 4. Summary of project development methods and objectives in use

Country: Method	Objectives
DK: Common government IT project model	Contribute to a better and more uniform planning, management and implementation of IT projects
SE: Method Development Coalition	Provide a common framework to ensure quality, meet common expectations and demands on development
UK: Agile method	Ability to better meet user needs;
	Improve quality and visibility of the method;
	Reduce cost to market
SA: YESSER software development life cycle	Assure predictability of work activities and achieving approximately the same deliverables with the same resources;
	Increase productivity and the probability that the deliverables produced will be the desired deliverables;
	Increase awareness of the required standards;
	Improve schedule and budget predictability;
	Increase quality and customers satisfaction
DE: V-Modell XT	Minimise project risks;
	Improve and guarantee quality;
	Reduce total cost over the entire project and system life cycle;
	Improve communication between stakeholders

Q: Is there an architecture repository at the national level? What are its objectives? What is the level of reusability of the artefacts?

Architecture repositories exist in 7 out of 11 developed countries (not in UK, RU and CA), while none of the developing countries have architecture repositories in place. However, the respondent from LB stated that there is a high emphasis of sharing and reuse of resources across the public sector.

The objectives of the repositories are to provide a reference point for project developments and architectural works, to provide consistency of the artefacts for reuse in new projects, to achieve synergies and sharing of artefacts, to promote reusability, to improve interoperability, to reduce costs by reducing duplication of artefacts and to improve quality in projects by providing quality assured artefacts.

The artefacts are extensively reused in NL and DK, reused in SA, DE, SE and AT, and rather not reused in MT (scale: extensively reused, reused, rather not reused, not reused). The respondent in MT stated that the repository is rather not reused because reuse is not institutionalised. The establishment of the repository in the UK is an on-going process. The UK respondent also stated that resource sharing is among the core technology codes of practice that "*must be demonstrated for the project to proceed*". The sharing and re-use of ICT components and solutions across government is also emphasised in UK's Government Digital Service (GDS) design manual.[1]

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[1] See: https://www.gov.uk/service-manual/technology/code-of-practice.html#the-technology-code-of-practice (last access: 2015/03/15).

Part E1: Evaluation *Q: Is there an evaluation framework at the national level? Is the framework obligatory, optional but recommended or optional and not recommended?*

At national level, 7 out of 11 developed countries apply evaluation frameworks (except in CA, SE and MT), which are obligatory for all except in AT where the framework is optional but recommended. 2 out of 7 developing countries have evaluation frameworks at the national level – LB (obligatory) and MW (optional but recommended).

Respondents from countries that lack evaluation frameworks at the national level reported impacts such as the lack of a possibility to determine whether the projects have achieved the objectives of the strategy or programmes, decentralised approaches to evaluation across the government, uncertainty whether the project outcomes are the desirable ones depending on time and financial investments, lack of possibility to measure the quality of the projects at the national level and low sustainability of the projects.

Q: Does the framework assess the alignment of the projects' objectives with the objectives of strategy and programmes?

Only in 2 countries, AT and SA, the evaluation frameworks include assessment of the alignment of project objectives with the objectives of both the strategy and programmes. The framework in CH and MW assesses the alignment of project objectives with strategic objectives since there are no programmes in CH and MW.

Part E2: Sustainability *Q: How important do you perceive sustainability to be addressed along project development? How is e-government sustainability ensured at the national level?*

All respondents considered e-government sustainability as a significant factor to be addressed in all e-government projects. A total of 24 sustainability factors were mentioned by respondents from country experts (see Table 5), except from CA, GE, LB and MX. The respondent from DE commented that the use of standards to ensure interoperability is particularly important in federal governments. Further to the sustainability factors identified, respondents were asked to recommend additional factors if the ones that are already in place are insufficient.

4   Recommendations

The results of the analysis of e-government implementation approaches in developed and developing countries reveal findings consistent with the literature and with international surveys: developing countries still lag significantly behind developed countries. We argue that developing countries can learn from experiences of developed countries for more successful e-government endeavours by applying a strategic framework for designing e-government as proposed in [7], and along this, by employing a set of measures to improve quality, efficiency, collaboration and success.

Recommendations for successful e-government implementation were put forward by the respondents in part F of the interview protocol. They are summarised in Table 6 and include political, economic, socio-cultural, technological and legal aspects as well

Table 5. E-government sustainability factors named by respondents

Sustainability factors	In place in (country)	Recommended in (country)
Government commitment to e-government implementation	UK, DK, SA, DE, GE	
Sufficient and continuous funding of e-government initiatives	UK, DE, CH, MT, GE	TN, EG, MW, LB
Continuous control and maintenance of solutions	CH, SA, NL, DE	TN, LB
Use of standards to ensure quality and interoperability	DE, UK, MT, RU	MW, NG, TN, GE, MX, EG, LB
Promote transparency in implementation and evaluation of projects	NL, AT	
Support the implementation of e-government with a legal framework	AT, DE, RU, GE	MX, NG, LB
Centralisation and coordination of e-government implementation at the national level through a centralised organisation	SA, GE	TN
Close linkage of e-government strategies with national development goals and policies in sectors such as health and education	DK, MX	UK
Yearly assessment of projects regarding outcome, prioritisation and sustainability by relevant stakeholders	AT	
Use of robust business cases	DK	
Use of robust guidelines for contracts, developments and implementation procedures of the projects	DK	
Development of reusable solutions	SE	
Ensure relationship and link between the strategy, programmes and projects, and also among different projects	NL	
Track usage of e-services and feedback of users	MT	
Ensure political support and commitment regardless the change in political leadership	DK	NL
Collect, use and disseminate knowledge on e-government implementation across the public sector	SE	
Ensure sufficient ICT infrastructure	RU	
Establish support from experts with a long-term perspective of e-government solutions		SE, EG, LB
Presence of a centralised evaluation framework		NG, MW, EG
Ensure sufficient ICT capacity in public sectors		GE, EG, MW
Ensure coalition and cooperation among ministries		DE, EG
Exercise accountability measures when projects are outsourced to private sectors		UK
Integrate knowledge between researchers and practitioners in public sectors		MT
Citizens' desire for the government to provide e-services		MX

as management aspects of implementing e-government. These recommendations provide a rich addition to current literature of e-government success factors.

Based on the insights from literature and data analysis, the following e-government design and implementation approaches have positive impacts on success e-government implementation and are therefore highly recommended for a transfer to developing countries:

Table 6. Recommendations for successful e-government implementation

Recommendations for successful e-government implementation	Country
Developed and developing countries	
Study and reflect the level of trust of citizens and their willingness in using e-government services when designing e-government strategies	UK, NL, RU, MX
Increase the understanding of the importance of coordination and collaboration in vertical and horizontal government relations in implementing e-government projects. Advantages of this must be made clear	SE, DE, SA, EG, MW, NG, LB, GE
Design e-government strategies whilst reflecting on the local settings of a country – PESTEL factors	NL, RU, UK, MX, EG, LB, TN, MW
Use user-friendly technologies and multi-channel delivery of services to cater the needs of all citizens including online and offline provision of services. Leverage on the opportunities brought by the widespread mobile market	NL, DK, MW, MX, TN
Establish a legal framework to support the implementation of e-government projects and increase an emphasis on data security and protection procedures	UK, EG, GE, MW
Ensure political support and commitment regardless the changes in political system to ensure e-government sustainability	NL, EG, MX, TN
Developed countries	
Use design thinking approaches and engage users in designing and providing e-services. Personalise services to users' conditions, skills and needs to increase the uptake of e-services by the users	UK, NL, CA, DE, RU, AT
Apply stakeholder management methods to ensure inclusion of dynamic groups of stakeholders in designing and implementing e-government solutions	CH, CA, MT
Change the government's role as a sole provider of e-services by encouraging other proprietors and societies to utilise open data and e-participation initiatives to provide public services	UK, CA
Assess the public value generated by the projects	UK, CA
Embed the use of ICT in the overall social welfare. Do not only migrate towards e-services but also use ICT to improve the quality of services provided via non-electronic media	UK
Policy and implementation are too far apart from each other therefore ensure advanced agreements among organisations to improve the implementation of cross-organisational projects	NL
Implementation of projects which are easier to manage and sustain	NL
Top management support in organisations	NL
Do not underestimate the importance of personal interactions e.g. in areas such as education and health. Personal	DK

Table 6. (*Continued*)

Recommendations for successful e-government implementation	Country
Developed and developing countries	
interactions should not be minimised but use ICT to improve the quality of those services	
Ensure obligated adoption of important aspects in e-government implementation for example interoperability standards and principles, evaluation methods and reusability of solutions	SA
Developing countries	
Use measures to ensure interoperability at all levels	GE, MW, LB, MX, EG, TN, NG
Formulate a centralised entity to coordinate, enforce and monitor e-government implementations	EG, LB, NG
Ensure human capacity in developing, implementing and maintaining e-government services and also for the side of users by providing continuous training	MW, NG, LB
Ensure accountability of public managers to the public and the parliament in the development and implementation of ICT solutions	TN

- *Define success factors for e-government that are customised to the country's circumstances.* Developing countries can benefit a lot by specifying success factors for their e-government strategies, programmes and projects, which are customised to their local circumstances in which they operate, and involving political, economic, socio-cultural, technological and legal conditions.
- *Mechanisms to ensure alignment between e-government strategies, programmes and projects.* Ensuring this alignment is significant to ensure that the objectives are achieved and consequently to evidence that resources are spent well. A total of 7 alignment mechanisms were identified mostly from developed countries.
- *Presence of government-wide interoperability frameworks.* Initiatives are already on-going in all developing countries investigated. However, developing countries need to ensure that their framework addresses the country's specific interoperability challenges and that continuous improvements of the national framework are ensured.
- *Presence of architecture repositories to avoid reinventing the wheel and to improve quality of design artefacts.* As architecture repositories promote reusability, improve quality of design artefacts and prevent redundant investments, developing countries can benefit from this opportunity of sharing and reusing.
- *Presence of evaluation frameworks at national level* to ensure that not only the objectives of the projects are achieved, but also contributions to the strategic objectives and the vision are made. Evaluation frameworks are particularly important for developing countries where funds are very limited. Also, transparency in evaluation and implementation of projects (sustainability factor) is important and recommended.

- *Implementation of project development methods at national level*. While no such methods are implemented so far in developing countries investigated, they can learn from developed countries particularly the objectives of methods, stages supported and adoption approaches across government. Only 6 out 18 countries studied implement such a method at national level. Interestingly, research on successful e-government project development methods and their impacts to the overall success in e-government implementation is scarce.
- *Include sustainability at strategy, programme and project levels*. Most of the 24 sustainability factors put forward are settled in developed countries while respondents from developing countries could only recommend them (as these are not yet applied in their countries). For example, a significant sustainability factor is a close linkage between e-government strategies and national development goals which is already applied in MX and DK and recommended in UK.
- *Learn from others and reuse concepts and solutions.* Experiences from developed countries can be a valuable and useful asset for developing countries to transferring concepts and solutions among developed and developing countries. Yet, capabilities of transferring and sustaining solutions from other countries have to be available, too.

5   Conclusion

This paper presented a qualitative analysis of e-government approaches in developed and developing countries based on a strategic framework for e-government design [7] to scope the areas of investigation: formulation of vision and strategy at the national level, selection of programmes, selection and implementation of projects, evaluation and sustainability. While literature cautions that the transfer of concepts and solutions is not a straightforward task and that the understanding of differences in the countries' contexts is important, this paper investigated the approaches of e-government development from 18 countries – 11 from developed and 7 from developing countries. Based on the analysis, recommendations were put forward for more successful e-government implementation in developing countries.

The findings highlight differences in the advancement of e-government implementation between developed and developing countries and, most importantly, the impacts of such advancements to successful implementation of e-government. The differences in implementing the approaches provided a rich ground in understanding the impacts of their presence/absence and for deriving recommendations to transfer best practices to developing countries.

Further research is required to assess the application of the recommended approaches in a particular country grounded with a good understanding of the context of the country, as recommended in the paper. Additionally, the studied approaches in this research call for richer investigations; for example, the contents and application of evaluation frameworks and project development methods at the national level demand for more details of understanding to operationalise transfer.

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