Georgia on My Mind: A Study of the Role of Governance and Cooperation in Online Service Delivery in the Caucasus

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Abstract. Georgia's achievements in public sector modernisation have been lauded, since 2004, for their ability to increase transparency, fight corruption, ease the way of doing business and improve public service delivery to citizens. Information Communication Technology (ICT) played an important role as an enabler of public sector reform. Despite this, research into the Georgian model of governance and inter-governmental cooperation is extremely limited. Similarly, literature reviews have, in recent years, pointed out limitations in the understanding of technology use in public service delivery and, particularly, the role governance, cross-governmental decision making, and cooperation play when introducing ICT solutions and online services to citizens. As part of a larger qualitative, multi-country comparison, this article analyses the Georgian approach to electronic governance (eGovernance). The analysis highlights the influence of politically motivated and driven public sector reforms underpinned by ICT use for better service delivery, transparency and a fight against corruption in the period 2004-2012. Despite early success in relation to ICT infrastructure, standards and roll-out to key enablers, the article finds that the electronic government (eGovernment) eco-system is fragmented and that the use of public and private online service (eService) is limited, despite high internet penetration and usage. The key barrier found is the lack of an effective governance and inter-governmental cooperation model to improve cooperation between government actors (e.g. data collection, quality and reuse, shared infrastructure, systems and service), build on existing infrastructure and enablers to optimize the value-added of earlier investments – particularly in relation to electronic identity management (eID), digital signatures (eSignature) and eServices. Georgia would benefit from a more formalized approach to ICT related programmes and projects by considering an IT-implementation model to effectively manage risk, improve benefit realization and link individual key performance measurements (KPI) to those of the eGovernment strategy and action plan..

Keywords: eGovernance, eGovernment, eService, use, inter-governmental corporation, analysis, Georgia.

1 Introduction

Googling Georgia two things are guaranteed: first, confusion between the European Republic of Georgia or the southern US state of Georgia, and second, the post-Rose Revolution wave of successful public sector improving transparency, fighting corruption and providing a more effective service delivery. The question remains: what has allowed a small, low income country in the Caucasus region to seemingly succeed where others have not and is the answer to the apparent success found in the governance model and level of inter-governmental corporation?

Multiple research disciplines have analysed the public sectors IT and technology use. Academics in public administration (PA) [1-6], information systems (IS) management [2, 3, 7-10], or electronic government and governance (eGovernment and eGovernance) [11-16], have all highlight the failures of the public sector to apply Information Communication Technology (ICT) with real success. Often cited mistakes include blindly digitising current processes [13, 16, 17] and focusing on technology and supply [18-20] rather than value-adding outcome and impact of IT and technology [4, 21, 22] – not only in relation to ICT use in public administration but in particular when it comes to the provision of online services (eService) for citizens [20, 23].

To address multiple models for assessment have been proposed. The so-called stage and maturity models have been a key tool of academics, consultants and international organisations in assessing the relatively success of eGovernment across countries since the 1990s. A major flaw of the models is non-the-less their focus on supply, technology and organisational issues but with a rather limited understanding of public service delivery, especially if enabled by ICT [8, 20, 23, 24]. In addition, multiple authors –including the 2016 review of maturity models, public sector reform, IT governance, eGovernment literature by Meyerhoff Nielsen [23] – finds that current research does not adequately addresses the role of governance and cooperation in ensuring the successful supply and use of online eService's. In fact, front-office service provision and back-office integration are mixed-up in the majority of maturity models. For example, one-stop shop portals do not constitute a form of transaction, but are rather an indicator of the degree with which authorities cooperate and integration in the production and provision of services via a joint portal [20, 23]. While Heeks tries to address this by proposing a two-dimensional matrix model distinguishing between the front- and the back-office [25], the proposed model does not account for eGovernance or take-up [26].

Similarly, none of the analysed maturity models addresses governance directly [23, 26]. Davison [27], Iribarren et. al. [8], Janowski [28], Kalambokis et. al. [29], Shareef et. al. [30] and Waseda [31] models highlight management and coordination issues, such as the existence of chief information officers (CIO). Cooperation, on the other hand, is indirectly addressed in most models. This is expressed in terms of vertical and horizontal integration, the sharing of information and data between public authorities (even the private and third sector), and the existence of one-stop shops [26, 32, 33], but again there is limited focus on the role of governance in proposing a national

vision and strategy, let alone in ensuring the required cooperation between actors or ensuring the realization of the envisioned effects.

To investigate the role of governance and inter-governmental cooperation in the successful supply and citizen use of eService's, this article analyses the Georgian use of ICT in public administration and eGovernment. The aim is two-fold: *to identify the Georgian features and lessons learned in relation to the role of eGovernance and inter-governmental cooperation and to add the Georgian lessons to a future cross-country comparison.*

To address the stated aim, this article starts by outlining the methodology used (section 2). The Georgian experience is presented using the conceptual framework, including background indictors and preconditions (section 3), before the national approach to governance, cooperation model and eGovernment is outlined (section 4) . Key enablers and services supplied and their use (section 5) is presented before observations and conclusions are presented (section 6).

2 Methods

As part of a larger study address the research gaps in relation to eGovernment governance and cross-governmental cooperation identified by Meyerhoff Nielsen [23], a classical exploratory, qualitative, case study methodology framework [34-36] is applied to enable a with-in case analysis.

An adapted version of Krimmer's context, content, process model (CCP model) [28] as used by Meyerhoff Nielsen for the Estonian [37], Faroese [38] and Danish cases [39], a Danish-Japanese [40] plus a Estonian-Georgian comparison [41] is chosen to allow for future cross-country comparison. The conceptual model consists of four macro-dimensions: Background indictors; national governance and cooperation model; national approach to eGovernment; and effect measurements and preconditions. Each dimension explains a key area that influences processes, choices and outcomes in relation to eService supply and take-up. Using the framework for the with-in case analysis to identify the governance mechanisms in play will allow the author to make a cross-case comparison to determine the correlation (i.e., the more of Y, the more X) between a strong cooperative governance model (cause) and the introduction of online services (effect 1) and subsequent citizen use of the online service delivery channel (effect 2).

Using the framework, this article identifies Georgia's respective strengths and weaknesses in relation to the country's respective governance models and eGovernment experiences since 1991, but with a particular focus on the period since 2010. Georgia has been chosen for two main reasons: it is a rarely studied but potentially interesting case representing a small, low income, centralised country [34, 36, 42]. This allows the author to later compare Georgia to a high-income centralised microstate like the Faroe Islands, a medium-income and centralized country of similar size like Estonia, a more populated, high-income, decentralised country like Denmark and a large, highly decentralized, high-income country such as Japan. Georgia, similarly, offers a chance to look at the role of governance and intergovernmental cooperation in

a different socio-economic context and helps the author isolate the role they play in the supply and take-up of citizen online services.

Primary sources used include relevant academic literature, relevant policy documents, national and international statistical sources e.g. International Telecommunications Union (ITU) [43] and UNDESA's eGovernment Readiness Index [44-46]. The written sources are complimented with a small number of interviews carried out in May 2015 and February 2017.

3 Results

As a result of history and culture, countries operate in different contexts and offer different perspectives and experience when it comes to eGovernment and online service provision for citizens. Similarly, population size, income levels, administrative systems, and complexity vary. It is therefore important to put things in context.

3.1 Socio-economic background

Georgia is, in socio-economic terms, a small but relatively populated country. Georgia is a small economy with a large trade deficit, but good GDP growth following a period of stagnation from 2008 until about 2014. The country is considered a nation state but with strong regional identities. The country, despite immigration, experiences population growth due to increased birth-rates [47, 48]. For details see key statistics in Table 1.

Table 1. Key socio-economic statistics 2016 [47, 48]

Population (January 2016)	3,720,400
Territorial size	69.700 km2
Population density	57.3per km2
Official languages	Georgian, Abkhazian (in Abkhazia)
Ethnic groups	Georgian 86.8%, Azeri 6.3%, Armenian 4.5%, other 2.3% (incl. Russian, Ossetian, Yazidis, Ukrainian, Kist, Greek)
Median age and life expectancy	38 years and 74.4 years
Population growth	-0.05%
Urbanization	53.6%
GDP 2016 (est.)	€13.67 billion
GDP per capita 2016 (est.)	€ 5,025
GDP growth rate 2016 (est.)	3.4%
Unemployment 2016 (est.)	12.1%
Imports 2016 (est.)	€ 6.43 billion
Exports 2016 (est.)	€2.69 billion

4 Internet access and use

For online service delivery to succeed, internet access and a minimum level of digital literacy and competences are essential pre-conditions. As an indicator of digital literacy levels individuals actual use of the internet, online banking and shopping sites are

used (eBanking and eCommerce respectively). To put Georgia in context, Table 2 includes the average for the EUs 28 member states.

Table 2. Individual and household access to, and use of the internet, 2010-2016, selected years (EU28 country average in brackets) [49]

	2010	2013	2016 [50]
Household internet access [51]	27% (70%)	82% (79%)	95% (86%)
Individual with mobile internet [52]	18.80%# (21%*)	42.74%# (24%)	63% (27%)
Individual using the internet (at least once a week)	-- (65%)	45.5%** (72%)	90% (79%)

authors estimation based on 0.70 million and 1.59 million transactions in 2010 and 2013 respectively. *2011 data. **2012 data

While data is available from the International Telecommunications Union (ITU), other and more recent and seemingly reliable (see discussion by Meyerhoff Nielsen [53]) data is available from other sources. Generally, the ITU data shows a more bleak picture of internet access and use in Georgia compared to e.g. the US Aid financed survey of 1,500 Georgians in 2016. While both sources show growth in household internet access, it is particularly impressive the fact that 90% of households in a low-income country like Georgia choose to pay for internet access. Combined with the high level of actual internet use, this confirms that the pre-conditions for introduction online government services and citizens actual use of them exist in Georgia.

5 eGovernment and governance

Georgia has, since the November 2003 Rose Revolution, actively pursued public sector reform. In particular, the period of 2004 to 2014 saw a massive change. Political initiative and a willingness to transform the public sector had wide spread public support and has created a solid ICT and legal foundation. The strategic focus was on transparency, accountability, efficient and effective public service delivery [54-56]. The role of ICT in underpinning the strategic objectives is therefore helpful for understanding the Georgian context and eGovernment outcomes.

5.1 Strategic focus since 1991

The Georgian eGovernment focus can be divided in two main periods: fragmented and uncoordinated use of ICT in the period 2004-2014, followed by attempts to introduce a more formalized approach and coordinated approach from 2014, as outlined in Table 3.

Table 3. eGovernment in Georgia, 2004-2018 [54-57]

2004-2014 ICT use in the public section	While no national eGovernment strategy or action plan in the period was active, individual initiatives in line ministries were implemented. As part of a general drive for public sector reform, increased access to public services, transparency and an anti-corruption drive, ICT use was initially focused on the creation of basic information systems, digitalizing internal information resources, automating information flows, creating data centres, and connecting national authorities with their regional offices.

2014-2018 Digital Georgia – eGovernment strategy and action plan	The first formal eGovernment strategy and action plan was approved in 2014 with the aim of making Georgia's public sector more efficient and effective, offering integrated, secure, and high quality eServices, improve usage and participation, and enabling ICT-driven sustainable economic growth. Strategy focuses on 11 thematic directions (i.e. eService's, eParticipation and Open Government, eHealth, Public Finance Management System, eBusiness, making Georgia a regional ICT-Hub Georgia, infrastructure, cyber security; skills development and e Inclusion) grouped into service areas, future excellence, ICT enablers as well as horizontal measures such as enabling frameworks, governance and awareness. The strategy has success criteria and is underpinned by an action plan with associated KPIs. The eGeorgia strategy is part of the Public Administration Reform Roadmap 2020 [58], which is an "umbrella" framework also including the Open Government Partnership, Anti-corruption, Public Finance Management System Reform, Regional Development, Civil Service Reform and eGovernment directions and action plans.

While the first decade of eGovernment and ICT use was uncoordinated and without a comprehensive "whole-of-government" vision, the use of ICT in the political drive for the transformation of the public administration have reflected similar patterns seen in Europe, the former Soviet Union and beyond (albeit at different pace), that is: infrastructure roll-out, backend systems, launch of key enablers like eID and core registers, increased access to public sector services, digital literacy and, subsequently on governance structures, standards , eService supply and use [40, 44-46, 53, 57, 59-62].

The introduction of the first actual eGovernment strategy and action plan has to date born little fruit. Despite extensive consultation of government stakeholders in 2012-2013, political approval and subsequent incorporation into the Public Administration Reform Roadmap 2020, funding has been limited and delayed [54-56, 63, 64]. A mid-term review consisting of three-days of stakeholder workshops facilitated by a team of international experts aimed to re-ignite the strategy and action plan. The result is a prioritisation of a number of building blocks in 2017-2018, in particular the reinforcement of effective enabling frameworks, such as the governance structure, enforcing eID management, increase back-office digitisation and the provision of more user-friendly eServices and ensure their actual use [54, 57, 64-66].

5.2 Governance model and institutional framework

Georgia is in many ways a small and highly centralized country. The central government institutions are few and provide most public services for citizens. Nine regions exist but have limited public service responsibility. Of the 74 municipalities, only the four main urban centres Batumi, Kutaisi, Telavi and the capital, Tbilisi, have the financial and human resources to provide citizen orientated services in larger numbers. The government and public authorities are actively trying to change this through the Public Service Hall and Community Center concepts – providing back-end systems, access to relevant registers and skills development [54, 57, 64, 67, 68]. Table 4 summarizes the general approach to public service delivery in Georgia.

Table 4. General governance and institutional framework [69-71]

National institutional framework and governance	Mostly centralized, decisions are made and executed on high horizontal level. Multi-level management approach is not implemented yet. eGovernment and ICT related initiatives are concentrated within key public agencies. Local gov-

	ernance with low capacity to deliver eService's and use ICT with interactions with citizens and businesses. The development of local eGovernment infrastructure and provision of eServices to local population is centrally implemented by the Public Service Development Agency within the MoJ.
Decentralisation of government authority	Limited, due to limited or lack of capacity in local governance level.

Like governance in general, Georgia's approach to ICT reflects the country's context, experience and public sector capacities, including decision making processes, the degree of cooperation between authorities and different levels of government, the private sector, civil society, and the research community.

Politically, Georgia has seen three distinct political periods since gaining independence in the wake of the Soviet Union collapse. From 1991 to 2003 the newly independent Georgia was dominated by the former elite, economic contraction and social upheaval, the Rose-Revolution 2003 against rampant corruption and inefficiency lead to a center-right reformist government lead by United National Movement (UNM), economic growth and a professionalization of the public administration. In the aftermath of the 2008 war, economic stagnation and increased dissatisfaction with the UNM government led the newly formed Georgian Dream party to win the 2012 Parliament elections and the 2013 Presidential elections. Since 2012, the economy has been slow to recover and at time showed a fragmented political focus. The post-2012 result has been a relatively small and professional public sector, but also resulted in deterioration of Georgia's positions government and eParticipation international rankings [44-46, 60, 72].

Historically, policies, strategies, action plans and institutionalized processes have often been fragmented or lacking. Focus has been on implementation of overall policy objectives rather than on formal processes, coherence of the overall ICT framework for the public sector or system documentations [54, 63, 73]. Georgian successes has initially been based on the political vision and willingness to reform the public sector, scrap old processes and legislation in favour of ICT systems, a more professional civil service – even firing 60,000 police officers to achieve the political vision of more efficient, effective, transparent and accountable government and service delivery [58, 74].

In relation to the eGovernance model, Georgia initially did not have a formalised structure focusing on ICT use in the public sector. The first attempt to formalise the institutional framework for eGovernment and ICT related intergovernmental cooperation emerged in 2007. The CIO Council was established and chaired by Prime Minister, the deputy chair was the MoJ and secretarial support by DEA – the mandated and regulatory authority for eGovernment. All relevant line-ministries and ICT related agencies were members of the CIO Council, as were key national ICT experts (incl. from the private sector and NGOs – and interestingly also from of US Aid). The CIO Council was responsible for the strategic direction and horizontal coordination, initiation and approving the eGovernment strategy, budgetary support, allocation of inter-agency support if required. The aim was to ensured cooperation and collaboration among key stakeholders. The MoJ constituted the mandated authority for eGovernment issues, with the actual implementation delegated to DEA. Authorities were gen-

erally responsible for ICT initiatives for their respective areas and service portfolios [54, 55, 57].

To increase the efficiency of inter-governmental cooperation in relation to ICT, CIO Council was replaced in 2014 with an eGovernment Unit based in the cabinet office [75]. In practice the change was never effectuated as the Unit had either limited or no staff. The subsequent vacuum has in effect allowed authorities to peruse their own agendas, set their own priorities and hampered the effective coordination of ICT in Georgia. This lack of inter-governmental coordination is a real barrier for enforcement of national standards for e.g. interoperability (IOP), reuse of data, usability requirements in eService's etc. It has also lead to lack of transparency of ICT project plans, objectives, budgets and activities. Ineffective, overlapping and redundant ICT investments is the result of the weakened governance model, as is unclear mandates, responsibilities and general lack of knowledge sharing and low exploitation of available skills [54, 65].

As a result, the 2016 mid-term of the 201-2018 eGovernment strategy have recommended a new governance structure which is summarised in Table 5.

Table 5. eGovernment governance and cooperation actors and responsibilities [54, 65, 75, 76].

Responsible authority for eGovernment strategy	The eGovernment Development Unit (eGDU) within the Department of Political Analysis (DPA) of the Administration of Government (i.e. the cabinet office) is responsible for strategic planning, planning, horizontal and vertical coordination eGovernment. When drafting strategies, stakeholders are consulted through both informal meetings, public hearings and debates. Georgia tends to use international experts or international organizations (e.g. EU, OECD, UN) for expert opinions on the draft strategy documents. On both strategic and operational levels, the Legal Entity of Public Law in the MoJs DEA is a key supporting authority for the cabinet office and leads and organizes the strategy drafting and consultative process. In practice, the DEA is the liaison body for public and private organization, collects input, organizes stakeholder meetings, workshops with external partners (including international organizations and foreign experts), draft position papers and preparing briefs.
Responsible authority for action plan	On the strategic and operational levels, the DEA is responsible for the oversight, coordination and monitoring of all eGovernment initiatives in the national action plan. The DEA provides the status updates and associated recommendations to the eGDU and the cabinet office, while the cabinet office has the final say in any decisions, including in cases of diverting opinions, disagreements or a lack of compliance with the eGovernment strategy and action plan objectives. The DEA is supported by thematic work groups of line ministries and stakeholder forums. The thematic work groups are formed to coordinate individual action plan initiatives and meet almost monthly.
Responsible authority for initiating and coordinating new eGovernment strategies and action plans	The DEA is responsible and mandated to initiate and coordinate eGovernment strategies and action plans with active involvement of all stakeholders. The DEA is guided by the cabinet office and eGDU vision and input from relevant authorities.
Chairperson organization	The Prime Minister chairs both the cabinet and the eGDU.
Hosting organization and secretariat Member organizations	eGDU is part of the cabinet office but supported by the mandated MoJ and the specialized agency DEA. Members of the eGDU are the DPA (housing the eGDU), DEA, ministry and agency CIOs, different eGovernment Legal Entities of Public Law, the National Regulatory Authority, the Georgian IT Innovation Center, NGOs and other civil society watchdogs like Transparency International and sometimes donor organizations (US AID, UNDP, EU, etc.).
National governance and cooperation model	The national coordination and collaboration mechanism is not fully implemented and therefore not reinforced. Many aspects of eGDU and DEA are currently duplicated.
Process of eGovernment strategy and action plan development and approval (from idea to approval by government)	Centralized, initiated and coordinated by the DEA, but hybrid as MoJ/DEA is responsible to the cabinet office and DPA which provides the vision and strategic direction, and to which issues can also be escalated. eGovernment strategies are initiated and drafted by the DEA, based on the direction given by the DPA, and in consultation with relevant stakeholders. Prior to finalization, the DPA

	ensures that strategy, action plan and their success criteria and KPIs reflects a "whole-of-government" approach, that all relevant stakeholders were consulted and is aligned with the general national strategic development framework, vision and strategic objectives. The DPA may solicit additional external experts or organizations (domestic and international) for input and adjust the DEA provided draft. The aim is to ensure ownership domestically, limit resistance to the strategic direction and initiatives as well as align the eGovernment strategy with international best practice and development in EU member states. The DPA is responsible for submitting the final strategy and action plan to the cabinet office for government approval and executing the strategy through decree.
eGovernment strategy legality	Yes, the eGovernment strategy is an integral part of Public Administration Strategy and Roadmap of Georgia which is approved by Prime Minister decree and is thus legally enforceable.
Action plan (i.e. is the strategy underpinned by an action plan)	The process and responsibilities are the same as for the eGovernment strategy.
Action plan legally binding	Yes, as part of the eGovenrnment strategy, the action plan is legally enforceable.

As outlined in Table 5, the Georgian eGovernment model has a high level of complexity. It can nonetheless be boiled down to three layers: the strategic level, the operational level, and the daily implementation level.

At the strategic level, the eGDU ensures that all governance processes, strategic visions and long-term decisions are in line with the political agenda of the country and, at the same time, that high political will is properly translated into executive action plans. All horizontal eGovernment and ICT projects, new initiatives and new authorities are discussed, evaluated and approved by strategic level. The eGDU carries out its work based on input from the MoJs specialised agency DEA, which is the mandated body for ICT and eGovernment.

At the operational level, the execution and management of the eGovernment decisions made at strategic level is carried out by the mandated body DEA. The DEA provides support to the strategic level in the planning and implementation of the strategic priorities, monitors eGovernment activities and implements a number of key initiatives as well – in short, the DEA ensures the strategic alignment and coordination of eGovernment activities in the short, medium and long term.

Daily implementation has always been decentralized to responsible line-ministries and authorities, but from 2016 onwards a co-ordination mechanism in the form of thematic work groups has been introduced. Each thematic work group is responsible for the implementation of their respective action plan initiatives and report to DEA on progress, risks and for potential conflict resolution. The DEA, in turn, presents regular management overviews to the eGDU and the cabinet office, including the escalation of issues to be solved at cabinet level. The model is illustrated in Figure 1 and further summarised in Table 6 below – where the strategic and tactical level is merged to allow for easier comparison with other case studies.

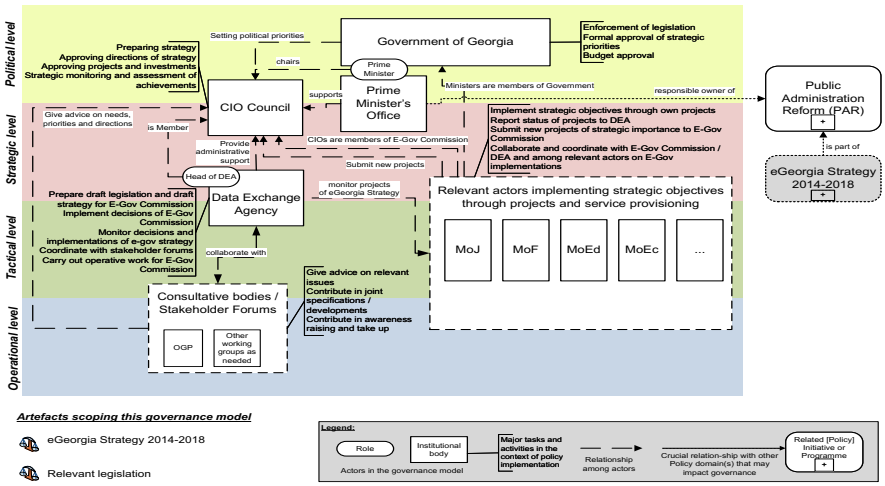

Figure 1. eGovernance and coordination model [65]

Table 6. eGovernance and coordination model implemented in 2016-2017 [54, 65, 75, 76]

	Co-ordination of the implementation of strategy	Wider co-ordination of the development of information society
Vision		Administration of the Government of Georgia Civil society organizations
Strategy	Administration of the Government of Georgia DEA	
Implementation of action plans	DEA	DEA, Communication Regulatory Body
Daily implementation and everyday work	Individual Ministries and responsible field agencies Thematic work groups /networks	

6 Key enablers, citizen eServices, their use and impact

Having confirmed that the required infrastructure and digital literacy exist (section 3), outlined the strategic eGovernment focus over time and described the governance and cooperation model (section 4), what has Georgia achieved in terms of the roll-out (supply) of key enablers and citizen eservices and impact (i.e. demand and use)?

Due to the fragmented eco-system for ICT and public sector services online, it is not easy to get a full picture. Key enablers, such as electronic identities (eIDs), digital signatures (eSignatures), core government registries (e.g. cadastral, property, population, business, vehicle registries), most national authorities have websites with information, a national Government Gateway is in place for data distribution and re-use, as is the www.opendata.ge portal, the statistical services www.geostat.ge and a national one-stop-portal www.my.gov.ge [56, 63, 77].

That said, the impact and value-added of the individual initiatives are hard to assess. The GovernmentGateway has seen a steady increase in the number of public and

private authorities integrate to the centralized service bus – almost 70% from 23 organizations in 2014, 26 in 2015, to 39 in 2016 – but the value of annual transactions have fallen 20% from approximately 55 million in 2015 to circa 44 million in 2016 [78]. The number of datasets available on the open data portal have increased 82.5% from 263 datasets in 2015 and 480 in 2016 [78]. By comparison, www.my.gov.ge only has 56 eServices available and the number of users is low, as highlighted in Table 7, and most users looked for information rather than transactional eServices. For instance, in 2016, 35% looked for information related to legal acts and public hearings, 18% looked for tax relation information, 17% visited the property registry, 16% looked for information related to border crossings, and 14% searched the vehicle registry for data [78].

Table 7. my.gov.ge use 2012-2016, selected years [78]

	2012	2013	2014	2015	2016
Registered users			7,740	4,650	40,026
Number of services	1,319	21,082	52,343	46,652	69,665
Repeat use per user*	--	--	6,76	10,03	1,74
% of population*	--	--	0,21	0,12	1,08

*Author's estimation.

The existence of eID/eSignature, digital post box solutions and a few select number of citizen service areas are confirmed in Table 8. What is harder to assess is the actual volume of public service delivery online – or degree of digitization (i.e. % of service delivery volume online). Where available the degree of digitization is included in Table 8.

Table 8. Individual use of the internet 2014-2016, selected years

	eService availability	Degree of digitization (i.e. % of service delivery volume online)		
		2010	2013	2016
eID/eSignature [50]	Yes		48.3% (2015)	62,7 %
Digital post [78]	Yes		584 (2015)	1,869
Tax declaration [50, 79]	Yes	c. 35%	96%	96%
Register for school	No			
Register for university	No			
Apply for student grant	No			
Change of address	No			
Housing subsidy	No			
Apply for pension	No			
Report vermin (FixMyStreet) [80]	Yes		400 reports	51 reports
Report theft	No			

*Author's estimation based on 2015 volume of 1,800,000.

**Author's estimation based on volume in 2010 of 678,770 electronic declarations, in 2013 of 2,526,004, in 2015 of 2,784,186 and in 2016 of 2,627,850.

Available data shows a mixed picture. A relatively large number of Georgians have an eID/eSignature enabled ID card and almost all tax returns are submitted online. There is only limited use of FixMyStreet type solutions. By contrast to the successful introduction online tax forms and the enabling eID and eSignature most high-volume/high-frequency service areas such as social benefits, registering a new ad-

dress, daycare, schools, universities are not available as eServices despite the existence of the required registries, good quality data and the document and data exchange infrastructure. Similarly, both citizens and authorities seem unaware of the potential efficiency of integrating services on the national portal or sending messages digitally via the joint-governmental digital post infrastructure provided by www.my.gov.ge.

Considering the limited data availability for eService use, statistics for the proportion of citizens use of online banking (eBanking), shop online (eCommerce) and their level of online interaction with public authorities is a useful substitute. Unfortunately, data is only available for 2016 and presented in Table 9.

Table 9. Citizens use of eBanking, eCommerce and interaction with public authorities online (at least once per year) 2010-2016, selected years (EU28 country average in brackets) [49, 50]

	2010	2013	2016*
Online banking	-- (36%)	-- (42%)	21% (49%)
Online commerce	-- (40%)	-- (47%)	14.6% (55%)
Interacted with government online	-- (41%)	-- (41%)	-- (48%)
Obtained info. from a gov. website	-- (37%)	-- (37%)	28.7% (42%)
Downloaded a form (for submission)	-- (26%)	-- (25%)	9% (29%)
Submitted a complete form (eService)	-- (21%)	-- (21%)	9.3% (28%)

*Georgian data is comparable to EuroStat data as it follows the same data collection methodology, although collected by US Aid funded national survey "Georgia Good Governance Initiative: E-Readiness Study in Georgia".

Despite the fragmented online service offers (depending on the service areas), the data in Table 9 highlights that the Georgians do use both private and public sector eServices, albeit at a far lower level than their general use of the internet – and most likely consisting of social media and online entertainment. While general internet access and use is higher than the EU28 average (see Table 2), Georgian use of eBanking, eCommerce and eGovernment services are all substantially lower (see Table 9). An interesting "Georgian dilemma" as actual use and households propensity to purchase internet for home use is on par with the most wired countries in the world, including other successful eGovernment service providers like Denmark, the Netherlands, and Estonia [39, 40, 49, 53].

7 Observations and conclusions

Backoffice ICT use in Georgia has been a success, as has the introduction of key enablers, relevant registers and standards. Similarly, a number of high-volume, high-frequency online services are available. The areas of open data, data reuse in government and eParticipation can be improved, but show some initial promise - particularly in relation to the open data portal. Georgia faces a number of recurrent challenges, including: limited budget availability; a shortage or underutilization of qualified staff; expensive infrastructure; a lack of some key national standards; data compatibility; and security issues [64]. These challenges are amplified by the vacuum left by an inefficient or missing governance structures to ensure cross-governmental cooperation

and joint-development, and has led to a fragmented ICT framework [55, 63, 65, 66, 72].

While Georgians household propensity to purchase internet access and citizens general use of the internet is higher than the EU28 average (see Table 2), the use of banking, commerce and government online service offers is by comparison all substantially lower (see Tables 2, 7-9). Despite the success in rolling-out the required internet infrastructure, the limited use of government eServices points to the influence of two inter-connected factors:

- While key enablers like eID and eSignatures are already rolled-out and available through the national ID card, actual use is limited. Online services need to be used to add value to the user and provide the envisaged return on investment, but this requires a coordinated and joint-governmental approach to usability and channel strategies, which are still lacking. Georgian authorities therefore need to increase their corporation to ensure that the national my.gov.ge portal contains all government eServices, no matter the responsible authority, that single-sign-on is implemented and that there is a common look-and-feel across different service delivery areas.
- The lack of eID/eSignature use, limited public awareness of online service offers and the value of using them, a lack for channel strategies and promotion of public sector eService – maybe even a lack of trust in online transactions involving payment and personal data. The limited public awareness and lack of channel strategies seem to be influenced by issues related to governance and inter-governmental cooperation.

While distributed responsibility is a common feature in most countries, Georgia currently does not have a fully functioning mechanise to ensure cooperation and compliance with the national eGovernment vision, established mandates and standards. Similarly, there is currently no actual mechanism to ensure adequate funding of ICT projects, bind to together fragmented initiatives or to ensure compliance with established mandates, standards etc. This points to the importance of cooperation between authorities and the level of integration between entities in the provision and production of services, as proposed by authors such as Heeks [5, 25], Lee & Kwak [32] Chen & Mingins [81]. The Georgian case therefore provides additional evidence in support of the positive role inter-governmental cooperation plays in the introduction and take-up of eService. In the Georgian context, the vacuum left by an un- or understaffed eGDU, and an unclear mandate for the DEA to take on this responsibility, is partly to blame for the current stagnation in relation to eGovernment and online service use.

The eGovernance model currently being implemented may be complicated on paper but could in theory be a solution – although it is worth simplifying it. In fact, many aspects of the eGDU and the DEA seem to be duplicated, which results in misunderstanding amongst stakeholders, resistance to comply with mandatory requirements specified in the joint-governmental policies and strategies – not least the eGovernment strategy and action plan. While strategic initiatives are in the process of improving local government capacities and their user of ICT, municipalities are remark-

ably absence in past, present and future eGovernment governance and inter-governmental cooperation models which are still largely planned vertically with national line ministries and agencies.

Similarly, the less than optimal use of joint infrastructures like the www.mygov.ge portal and eID/eSignature are examples of how benefit realization and value creation of ICT investments is not maximized due to authorities incompliance or limited support for key strategic objectives. Thus, the Georgian case highlights the importance of good management and coordination of government eGovernment activities in support of authors such as Davison [27], Iribarren et. al. [8], Janowski [28], Kalambokis et. al. [29], Shareef et. al. [30], Waseda [31] and organizations such as the OECD [82].

In conclusion, *the Georgian case adds support to the initial question asked i.e. that there is a positive relationship between a strong cooperative eGovernance model (cause) and the introduction of online services (effect 1) and subsequent citizen use of the online service delivery channel (effect 2).* The Georgian experience highlights the importance of a formal governance model for ICT use. A governance model with clear and recognized mandates to ensure that decisions are made, conflicts are resolved, and the strategic visions, objectives and outcomes are achieved. While the existence of a national CIO (like the eGDU) or specialized government entity for eGovernment (like the DEA) does not guarantee success, the current vacuum in Georgia is a clear example of what often happens when a mechanism to ensure compliance with a strategic vision, decision making and conflict resolution is missing. The positive impact of informal and personal networks and the role of individuals in driving a vision, ensuring coordination and inter-governmental cooperation can play also emerge in the Georgia case, but with limited results. While having at least a partial mandate, the DEA staff has not been able to fully convince line ministries of the need for cooperation rather than launching overlapping or conflicting initiatives. While initially successful, the Georgian approach to eGovernance and inter-governmental cooperation would benefit from a streamlining of potentially overlapping mandates and the formalisation of informal networks. This will help minimize the risk of failure if consensus cannot be reached and if personal and institutional capacities or contacts do not exist (or fail).

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References

1. Bannister, F. and R. Connolly, Transformation and Public Sector Values, in tGov 11. 2011, Brunel University: London.
2. Brown, C.V. and S.L. Magill, Alignment of the IS functions with the enterprise: toward a model of antecedents. MIS quarterly, 1994: p. 371-403.
3. Brown, A.E. and G.G. Grant, Framing the frameworks: A review of IT governance research. Communications of the Association for Information Systems, 2005. 15(1): p. 38.
4. Cordella, A. and C.M. Bonina, A public value perspective for ICT enabled public sector reforms: A theoretical reflection. Government information quarterly, 2012. 29(4): p. 512-520.
5. Heeks, R., Implementing and managing eGovernment: an international text. 2005: Sage.
6. Pollitt, C. and G. Bouckaert, Public Management Reform: A comparative analysis-new public management, governance, and the Neo-Weberian state. 2011: Oxford University Press.
7. Klischewski, R. and H.J. Scholl, Information quality as capstone in negotiating e-government integration, interoperation and information sharing. Electronic Government, an International Journal, 2008. 5(2): p. 203-225.
8. Iribarren, M., et al., Capability maturity framework for eGovernment: A multi-dimensional model and assessing tool, in Electronic Government. 2008, Springer. p. 136-147.
9. Ross, J.W., P. Weill, and D. Robertson, Enterprise architecture as strategy: Creating a foundation for business execution. 2006: Harvard Business Press.
10. Poeppelbuss, J., et al., Maturity models in information systems research: literature search and analysis. Communications of the Association for Information Systems, 2011. 29(27): p. 505-532.
11. Heeks, R. and S. Bailur, Analyzing e-government research: Perspectives, philosophies, theories, methods, and practice. Government Information Quarterly, 2007. 24(2): p. 243-265.
12. Huijboom, N., et al., Public Services 2.0: the impact of social computing on public services, in Institute for Prospective Technological Studies, Joint Research Centre, European Commission. Luxembourg: Office for Official Publications of the European Communities. 2009: Luxembourg.
13. Traunmüller, R. and M.A. Wimmer, E-government at a decisive moment: sketching a roadmap to excellence, in Electronic Government. 2003, Springer. p. 1-14.
14. Millard, J.C., Luca; Galasso, Giovanna; Riedl, Reinhard; Neuroni, Alessia C. ; Walser, Konrad; Sami Hamida, Andreas; Huijboom, Noor; Meyerhoff Nielsen, Morten; Leitner, Christine; and R.S. Fehlmann, European eGovernment 2005-2007: Taking stock of good practice and progress towards implementation of the i2010 eGovernment Action Plan. 2007. p. 80.
15. Christine Leitner, J.-M.E., François Heinderyckx, Klaus Lenk, Morten Meyerhoff Nielsen, Roland Traunmüller, eGovernment in Europe: The State of Affairs. 2003. p. 66.
16. Bannister, F., Dismantling the silos: extracting new value from IT investments in public administration. Information Systems Journal, 2001. 11(1): p. 65-84.
17. de Bri, F. and F. Bannister, Whole-of-government: The continuing problem of eliminating silos. Proceedings of the 10th European Conference on eGovernment, National Centre for Taxation Studies and University of Limerick, Ireland, 2010: p. 122-133.
18. Janssen, M., Y. Charalabidis, and A. Zuiderwijk, Benefits, adoption barriers and myths of open data and open government. Information Systems Management, 2012. 29(4): p. 258-268.

19. Lips, M., E-government is dead: Long live public administration 2.0. Information Polity, 2012. 17(3): p. 239-250.
20. Meyerhoff Nielsen, M., Supply and use of citizen eServices: An analysis of selected national experiences in relation to existing governance and cooperation models. NISPAcee Journal of Public Administration and Policy, 2015. 23.
21. Bannister, F., The curse of the benchmark: an assessment of the validity and value of e-government comparisons. International Review of Administrative Sciences, 2007. 73(2): p. 171-188.
22. Andersen, K.V. and H.Z. Henriksen, E-government maturity models: Extension of the Layne and Lee model. Government information quarterly, 2006. 23(2): p. 236-248.
23. Meyerhoff Nielsen, M., The Role of Governance, Cooperation, and eService Use in Current eGovernment Stage Models. 2016: Hawaii.
24. Pöppelbuß, J. and M. Röglinger. What makes a useful maturity model? a framework of general design principles for maturity models and its demonstration in business process management. in ECIS. 2011.
25. Heeks, R., A better eGovernment maturity model, in iGovernment Briefing. 2015, University of Manchester: Manchester.
26. Meyerhoff Nielsen, M., Governance failure in light of Government 3.0: Foundations for building next generation eGovernment maturity models, in Government 3.0 - Next Generation Government Technology Infrastructure and Services - Opportunities, Enabling Technologies, Challenges and Roadmaps, A.M. Ojo, Jeremy, Editor. FORTHCOMING 2017, PAIT - Public Administration and Information Technology,.
27. Davison, R.M., C. Wagner, and L.C. Ma, From government to e-government: a transition model. Information Technology & People, 2005. 18(3): p. 280-299.
28. Janowski, T., Digital government evolution: From transformation to contextualization. Government Information Quarterly, 2015. 32(3): p. 221-236.
29. Kalampokis, E., E. Tambouris, and K. Tarabanis, Open government data: a stage model, in Electronic government. 2011, Springer. p. 235-246.
30. Shareef, M.A., et al., e-Government Adoption Model (GAM): Differing service maturity levels. Government Information Quarterly, 2011. 28(1): p. 17-35.
31. Obi, T., WASEDA - IAC Internationl e-Government Index. 2015, Waseda University and IAC International Agency of CIO Tokiyo.
32. Lee, G. and Y.H. Kwak, An open government maturity model for social media-based public engagement. Government Information Quarterly, 2012. 29(4): p. 492-503.
33. Chen, J.Y., Y.; Mingins, C. . A Three-Dimensional Model for E-Government Development with Cases in China's Regional E-Government Practice and Experience. in ICMeCG, 2011 Fifth International Conference on Management of e-Commerce and e-Government. 2011. Wuhan: The Institute of Electrical and Electronics Engineers Inc.
34. Benbasat, I., D.K. Goldstein, and M. Mead, The case research strategy in studies of information systems. MIS quarterly, 1987: p. 369-386.
35. Rohlfing, I., Case Studies and Causal Inference: an integrative framework. 2012: Palgrave Macmillan.
36. Yin, R.K., Case study research: Design and methods. 2013: Sage publications.
37. Meyerhoff Nielsen, M., eGovernance and Online Service Delivery in Estonia, in 18th International Digital Government Research Conference on Digital Government Research, DG.O 2017. 2017 FORTHCOMING: New York.
38. Nielsen, M.M. Digitising a small island state: A lesson in Faroese. in Proceedings of the 9th International Conference on Theory and Practice of Electronic Governance. 2016. ACM.

39. Meyerhoff Nielsen, M. Governance and Online Service Delivery: The Danish Case. in 15th IFIP Electronic Government (EGOV) and 8th Electronic Participation (ePart) Conference 2016. 2016. Guimarães: IOS Press.
40. Meyerhoff Nielsen, M., eGovernment and Governance: The Danish-Japanese timelines and models compared. CeDEM Asia 2012, 2016: p. 53-66.
41. Meyerhoff Nielsen, M., Citizen use of government eServices: Comparing use, governance and cooperation models in Estonia and Georgia, in 25th NISPAcee Annual Conference - Innovation Governance in the Public Sector. 2017, NISPA: Kazan.
42. Collier, D. and J. Mahoney, Insights and pitfalls: Selection bias in qualitative research. World Politics, 1996. 49(01): p. 56-91.
43. ITU - Internet Telecommunications Union. Worlds Telecommunication / ICT Indicators Database. 2014; Available from: http://www.itu.int/en/ITU-D/Statistics/Pages/publications/wtid.aspx.
44. UNDESA - United Nations Department of Economic and Social Affairs, E-Government Survey 2010: Leveraging e-government at a time of financial and economic crisis. 2010, United Nations: New York.
45. UNDESA - United Nations Department of Economic and Social Affairs, E-Government Survey 2012: E-Government for the people. 2012, United Nations: New York.
46. UNDESA -United Nations Department of Economic and Social Affairs, E-Government Survey 2014: E-Government for the future we want. 2014, United Nations: New York.
47. CIA - Central Intelligence Agency. The World Factbook. 2015 1 July 2014 [cited 2015 1 October]; Available from: https://www.cia.gov/library/publications/the-world-factbook/rankorder/2119rank.html.
48. GeoStat - National Statistics Office of Georgia. Key indicators. 2016 [cited 2017 13 February 2017]; Available from: http://www.geostat.ge/index.php?action=0&lang=eng
49. Eurostat. Information society household survey. 2016 [cited 2016 29 June 2016]; Available from: http://ec.europa.eu/eurostat/web/information-society/data/database.
50. US Aid, Georgia Good Governance Initiative: E-Readiness Study in Georgia (Nationwide Survey) 2017, US Aid,: Burlington.
51. Caucasus Research Resource Center. Webhome. 2016 [cited 2017 13 February 2017]; Available from: http://caucasusbarometer.org/ge/cb2013ge/WEBHOME/.
52. Georgian National Communications Commission. 2015 წლის საქმიანობის ანგარიში 2016 [cited 2017 13 February 2017]; Available from: https://www.gncc.ge/uploads/other/1/1976.pdf.
53. Nielsen, M.M., E-governance and stage models: analysis of identified models and selected Eurasian experiences in digitising citizen service delivery. IJEG - International Journal of Electronic Government,, 2016. 12(2): p. 107-141.
54. Interview 1 - Key staff at DEA - Data Exchange Agency, Governance and online service delivery and use in Georgia, M. Meyerhoff Nielsen, Editor. 2017, N/A: N/A.
55. Interview 2015 - Key staff at DEA - Data Exchange Agency, Group interview with key staff at DEA - Data Exchange Agency, M. Meyerhoff Nielsen, Editor. 2015, N/A: N/A.
56. Goderdzishvili, N. and T. Gvenetadze. Georgia's successful journey to e-government. in Proceedings of the 8th International Conference on Theory and Practice of Electronic Governance. 2014. ACM.
57. Krabina, B.L., Po-Wen Liu; Meyerhoff Nielsen, Nielsen; Millard, Jeremy; Reichstädter, Peter; Wimmer, Mario, A Digital Georgia: e-Georgia strategy and action plan 2014-2018, DEA - Data Exchange Agency, Editor. 2014, Government of Georgia: Tblisi.
58. Government Planning and Innovation Unit, Public Administration Reform Roadmap 2020, Government Planning and Innovation Unit, Editor. 2015, Government of Georgia: Tblisi.

59. JoinUP, eGovernment in Estonia, February 2016, Edition 18.0. 2016, EC - European Commission: Brussels.
60. UNDESA - United Nations Department of Economic and Social Affairs, E-Government Survey 2008: From e-government to connected government. 2008, United Nations: New York.
61. Heeks, R., Understanding and measuring eGovernment: international benchmarking studies. UNDESA workshop,"E-Participation and E-Government: Understanding the Present and Creating the Future", Budapest, Hungary, 2006: p. 27-28.
62. Meyerhoff Nielsen, M. and K. Bagarukayo, The role of governance in the supply and take-up of government eServices: The case of Kenya, Uganda, Rwanda and South Africa, in Catalyzing Development through ICT Adaption: The Developing World Experience, H.L. Kaur, Ewa; Marszk Adam, Editor. Forthcoming, Springer: New York City.
63. Gvenetadze, I., Georgian e-Government Model in the Reform of Public Administration, D.-D.E. Agency, Editor. 2017, DEA - Data Exchange Agency: Tblisi.
64. Gvenetadze, I., Georgia's Successful Journey to E-Government, D.-D.E. Agency, Editor. 2016, CU4EU.
65. Millard, J.W., Maria; Reichstädters, Peter, Update on e-Georgia Strategy 2014-2018: Implementation and Prioritization roadmap 2017-2018 (INTERNAL DOCUMENT), DEA - Data Exchange Agency, Editor. 2017, Government of Georgia: Tblisi.
66. Turashvili, T. Georgia in UN E-Government Survey - Results and Recommendations. 2016 [cited 2017 11 February 2017]; Available from: https://idfi.ge/en/georgia-in-the-un-e-governance-research-review-of-findings-and-recommendations.
67. Public Service Development Agency. Community Centre. 2017 [cited 2017 13 February 2017]; Available from: http://www.centri.gov.ge/en/about-us/history.
68. საქართველოს მთავრობის დეცენტრალიზაციისა და თვითმმართველობის განვითარების სტრატეგიის ძირითადი პრინციპები 2013-2014 წლებისთვის, in 223. 2013, Legislative Herald of Georgia,: Georgia.
69. საქართველოს კონსტიტუცია, in 768. 1995, Legislative Harald of Georgia,: Georgia.
70. Resolution 188 (2004) on Local and Regional Democracy in Georgia, in 188. 2004, Council of Europe: Georgia.
71. Public Relations Service. Introducing e-governance in local self governments. 2017 [cited 2017 15 February 2017]; Available from: http://sda.gov.ge/?page_id=7492&lang=en.
72. IDIF - Institute for Development of Freedom of Information, E-Governance and E-Transparency - International Tendencies and Georgia. 2016, IDIF - Institute for Development of Freedom of Information,: Tblisi.
73. Administration of Government, პოლიტიკის დაგეგმვის სისტემის რეფორმის სრატეგია, A.o. Government, Editor. 2015, Government of Georgia: Tblisi.
74. Administration of Government, Social-economic Development Strategy of Georgia: GEORGIA 2020, Administration of Government, Editor. 2014, Government of Georgia,: Tblisi.
75. Administration of Government, Organigram of Georgian Government, Administration of Government, Editor. 2014, Government of Georgia: Tblisi.
76. On the Creation of the Legal Entity of Public Law (LEPL) – Data Exchange Agency, in 1536-RS. 2009, Legislative Herald of Georgia: Georgia.
77. Obi, T., WASEDA - IAC International e-Government Index, G.S.o.A.-P.S. Toshio Obi Laboratory, Editor. 2016, Waseda University: Tokyo.

78. DEA - Data Exchange Agency, Various use statistics for key infrastructure, M. Meyerhoff Nielsen, Editor. 2017, DEA - Data Exchange Agency: Tbilsi.
79. Revenue Service, Annual report of Revenue Service of Georgia, 2010, R. Service, Editor. 2016, Ministry of Finance: Tblisi.
80. Transparency International. Fix my street, Georgia. 2017 [cited 2017 15 February 2017]; Available from: https://www.chemikucha.ge/en/.
81. Chen, J.Y., Y.; Mingins, C. , A Three-Dimensional Model for E-Government Development with Cases in China's Regional E-Government Practice and Experience. ICMeCG, 2011 Fifth International Conference on Management of e-Commerce and e-Government, 2011: p. 113-120.
82. OECD, Recommendation of the Council on Digital Government Strategies 15 July 2014 - C(2014)88. 2014, OECD: Paris.