THEORETICAL INTERPRETATION OF E-GOVERNMENT IMPLEMENTATION CHALLENGES IN SOUTH AFRICA: A CASE STUDY OF A SELECTED PROVINCIAL GOVERNMENT

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Abstract

This paper discusses factors influencing e-Government initiatives by African Governments to improve services to their citizens, businesses and their constituent. It further discusses, as a socially constructed phenomenon, the degree of readiness of governments to implement e-Government initiatives to improve services. The discussion uses Actor Network Theory (ANT) and in particular the concepts of moments of translation and irreversibility as a lens through which to understand and interpret the social phenomenon. Although a number of e-Government researchers have argued that strong leadership and clear vision is required to implement e-Government initiatives, the view is that Governments have continuously failed to achieve the intended results. E-Government potentials and benefits which are well documented in Information Systems and e-Government research literature have not been realised by governments due to limited capabilities in the administration of the public service. The study applied a deductive approach where semi-structured interviews were used for data collection in a selected Provincial Government in South Africa. The outcome is a general framework to determine the readiness of South Africa government and generally, African governments for e-Government initiatives to achieve the intended results.

Keywords: Government, e-Government, Transformation, Actors, Services

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1. Introduction

E-Government projects are often a result of formal and informal interaction of actors which results in complex relationships and forces that impact on the deployment of those projects. E-Government has and is currently receiving global attention because of its ability to make governments more efficient and effective, thus to transform relations with citizens, businesses, and government departments (Walsham & Sahay 2005). Due to the important role played by e-Government, its implementation calls for strong leadership and clear vision. E-Government contributes towards promotion of development and reduction of poverty while it has potential of strengthening the performance of government administration; by introducing efficiency and effectiveness which comes as a result of, among others, being able to access government services anytime and from anywhere. This is particularly relevant in developing countries where public administration is known to be inefficient, has limited capacity, and with poorly-trained personnel (Schuppan 2009). The bottom line is that e-Government can contribute to solving government

administrative problems and can greatly benefit the developing countries. E-Government is seen as a solution that transforms government services using information and communication technologies (ICT). According to Hunnius & Schuppan (2013) e-Government is more than just implementation of ICT systems, which would merely transform government to online delivery of services but it is a total reorganization of the public sector through the use of ICT. This calls for the rethinking of the way public services are delivered and thereby having a transformational impact. In this transformation the whole model of public management, relationships, and behaviours are altered.

Literature indicates that most e-Government projects in developing countries fail (Heeks, 2003a; Lessa, Negash, & Belachew, 2012; Pillay, 2012; Gunawong & Gao, 2010; Lines, 2005). According to Reich (2007) one out of every three information technology (IT) projects fails because they either miss the targets or fail to deliver the required business functionality. Almarabeh & AbuAli (2010) believe that the underlying potential of e-Government initiatives to achieve the envisaged outcomes is through access to a better understanding of the

challenges faced by governments. Heeks (2001) indicates that the challenges that confront e-Goverment relate to service delivery strategies in the developing countries having been done in a non-integrated manner leading to more money being spent with very little success to create hope for poorer communities and individuals. This has resulted in ICT for development initiatives in developing counties not making governments effective and efficient in service delivery to citizens, businesses, and employees and among government departments themselves. There are other causes of e-Government project challenges that mostly lead to what researchers have identified and described as failure. In the year 2000 the cause for e-Government project failure was identified to be lack of commitment from political leadership and public managers (Bhatnagar, 2000). Aichholzer (2004) identified poor management of long-term sustainability risks as the main cause of e-Government project failure. The e-Government challenges have prevented governments from realizing visible improvements despite the fact that billions are spent on ICT. Heeks & Bailur (2007) estimate an expenditure of US$3 trillion on e-Government projects in the years between 2000 and 2010 with a 60% rate of failure. Since there have not been further studies to test or comment on these claims, this research will attempt to investigate with the case study this rate of failure. This is a large amount of money that could have been used to support other services to benefit the citizens. Heeks (2003) states further that e-Government project failure is caused by the amount of change required to move from a current state to the new envisaged state that he refers to as the design reality gap. The bigger the gaps the greater are the chances of failure. According to Lessa, Negash, & Belachew (2012) these causes of project failure have been identified and little has been done to improve the situation. Heeks (2002) identified readiness as a strategic challenge to e-Government in Africa as a whole. In bringing about the e-Government to reality there are a number of predictors (or factors – Heeks (2002)) that can be used to predict the outcome of e-Government implementation or the implementer's readiness thereof. These might not have been considered as very important by implementers of e-Government. Table 2 describes these predictors or readiness factors.

Given the stated problem, the paper sought to identify e-Government practices which may have contributed to the e-Government initiatives meeting or not meeting the intended goals and objectives. It seeks to stimulate a discussion on the importance of e-Government strategy review, how to get value from e-Government initiatives and how to determine success criteria for e-Government initiatives. An attempt was made to explore how these can contribute in addressing the issues associated with e-Government. This led to the main research question

"how can Governments determine their readiness to implement e-Government projects?" This led other sub-questions adapted from Heeks (2002) which due to space cannot be stated. Given the stated problem and the research questions above, the objective of this paper is to determine the readiness of governments to implement e-Government projects as a socially constructed phenomenon. This was done in relation to the e-Government predictors. The assumption was that the absence of the e-Government implementation predictors would result in failed e-Government projects. The concepts of Moments of Translation and irreversibility of Actor Network Theory (ANT) was used as a lens through which to understand and interpret the social phenomenon (e-Government readiness) and thereby establish a general framework that can be used by governments to assess their e-Government readiness as they plan their ICT strategies and implementation. This will also enable the project team to better understand the impediments that prevail during e-Government implementation and initiatives needed to overcome them. Given the above, this paper is structured as (a) A brief overview of Actor Network Theory (ANT) and the concept of moments of translation (MoT) and irreversibility; (b) A summary of the methodology and the case narrative; (c) Reinterpretation of the case study from the perspective of MoT; and (d) Implications as a general framework.

2. THEORETICAL FRAMEWORK

2.1 Overview of Actor Network Theory (ANT)

Twum-Darko (2011, p.30) argues that ANT is used as a lens to provide an understanding and interpretation of not only the process and interactions between actors but also of the meanings that people assign to the form of interactions between actors to align diverse interests. This process of alignment of diverse interests, when effective, results in the creation of a network of actors linked by associations. To facilitate understanding and interpret the meaning people assign to the form of interactions between actors to align diverse interests, this section describes the Moments of Translation and irreversibility concepts of ANT. In the e-Government context the non-human elements could be policies, technology, government services etc. Actors, whether human or non-human, have interests which they pursue. According to Tatnall & Gilding (1999) actors do not define themselves, but are defined by the relations to other actors in the network. Actors initiate action or can be acted upon. In a heterogeneous network all actors are considered equal with no discrimination on either human or non-human actors (Nijland 2004). Despite what Nijland said Stanforth (2006) states that the position of machines in ANT is different to that of humans. They are not possessed of an inherent

momentum that allows them to pass through a neutral social medium (Latour, 1987). Instead they are continuously shaped and reshaped by the interplay of a range of heterogeneous forces within the networks (Stanforth, 2006b). Machines are as much actors in the networks as are the humans. According to Callon & Latour (1981) an actor-network exists when human and non-human actors interact and produce some kind of result. Furthermore, ANT sees the world as a network of related elements with no social order. Such a network is formed through moments of translation.

According to Callon (1986) the four moments of translation are: (i) problematisation – where the key actor makes himself indispensable to others by presenting the problem to them by compelling them to see things his way; (ii) interessement – after successful problematisation, the key actor attempts to lock the others into place by intervening in interactions between other actors and defining the linkages between them; (iii) enrolment – the key actor defines the roles other actors need to play and the way in which they play and (iv) mobilisation – the key actor act as representatives or spokespersons of the rest of the actors. Irreversibility is the final stage of the actor network. Whether inscriptions are followed or avoided depends on the strength inscriptions. The stronger the inscriptions the more irreversible the network becomes (Mpazanje, 2009). The decision to follow or not to follow an inscription is dependent on its strength (Mähring et al., 2004). Irreversibility is the state at which the development of the network has advanced so much that it becomes difficult to revert to the old ways. This is a state where the network is established and strengthened. It may take iterative inscriptions before the actor-network reaches an irreversible state (Mähring et al., 2004). The table below summarises the concepts and definitions of ANT to be applied throughout the paper.

Table 1. Definition of some central concepts of ANT

Concepts	Definitions
Actor	Any element which bends space around itself makes other elements dependent upon it and translates their will into the language of its own [Callon and Latour, 1981].
Actor-Network	Heterogeneous network of aligned interests [Callon and Latour, 1981]
Problematization	The first moment of translation during which a focal actor defines identities and interests of other actors which are consistent with its own interests, and establishes itself as an obligatory passage point (OPP), thus rendering itself indispensable [Callon, 1986].
Obligatory Passage Point	A situation which has to occur for all of the actors to be able to achieve their interests, as defined by the focal actor [Callon, 1986].
Interessement	A process of convincing actors to accept the definition of the focal actor [Callon, 1986].
Enrolment	A situation when actors accept roles defined for them by the focal actor [Callon, 1986].
Mobilization	A situation where actors choose to become legitimate spokespersons of the groups they claim to represent [Callon, 1991].
Inscription	A process of creation of technical artefacts which would ensure the protection of certain interests [Latour, 1992].
Irreversibility	Degree to which it is subsequently impossible to return to a point where alternative possibilities exist [Walsham, 1997]

Source: Sidorova and Sarker (2000, p.1663)

The trend that emerged from the literature is that there is a strong relationship between the level of e-Government readiness and the success (or even the improvement) of the implementation of e-Government projects. This implies that the higher the level of readiness the more sustainable the network of aligned interest is. The level of readiness is seen as a contributing factor towards the irreversibility of the actor network. From the conceptual framework in Figure 1 below, it can be deduced that e-Government implementations with higher levels of readiness will enable networks of aligned interests to be sustainable. This means that the higher the e-Government readiness, the more successful the implementation will be.

Table 2. Actors and level of orientation

| Readiness Factor	Description	ANT
Process Infrastructure	Management systems, data standards, records and work processes	Obligatory Passage Point
Legal Infrastructure	Laws (policies) and regulations	Problematization
Institutional Infrastructure	To act as a focus for awareness and to act as a means	Interessement

Readiness Factor	Description	ANT
	for facilitation of e-Government	
Human Infrastructure	Attitudes, knowledge and skills required to initiate, implement and sustain e-Government initiatives	Mobilization
Leadership and Strategic Thinking	Leaders with vision who make it happen, senior officials who feel willing or able to champion e-Government	Enrolment
Technological Infrastructure	Telecommunications infrastructure	Irreversibility

Source: adapted from Heeks, 2002

The Table 2 seeks to deepen the understanding of pre-conditions that come to play during e-Government implementation. There is close alignment between Table 2 and the research questions given above. The conceptual framework (Figure 1), which was later refined, was used to tease out the research questions and also used to determine factors that contributed to the strengthening of the network of aligned interests. Data collection instrument was drawn using the conceptual framework as a guide. Figure 1 was used to explain what emerges from the relationships between the actors in the actor network and the degree of the irreversibility of the aligned interest towards the project implementation success. It was certain that as the actors' aligned interest in the network went through the moments of translation (Figure 1), the stronger the alignment of interests in the e-Government project initiative, the higher the level of e-Government readiness and the greater the implementation success due to the irreversibility state of the aligned interests of the actors.

Figure 1. The Actor Network Conceptualized
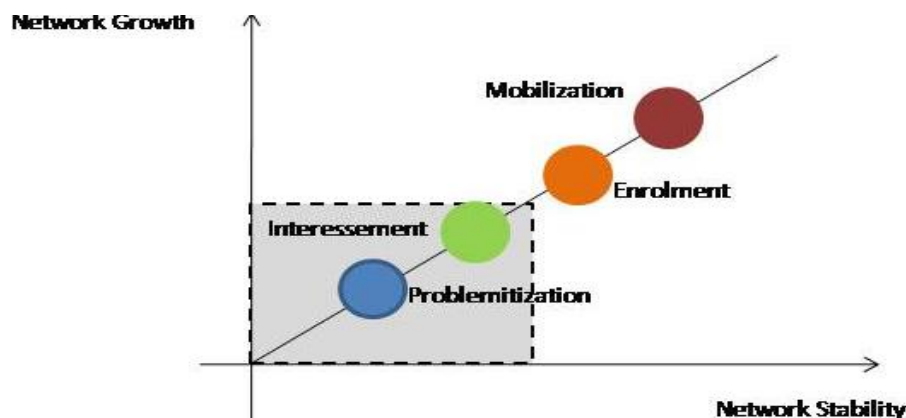
Source: Twum-Darko, 2011, p. 196-199

2.2 The Case Study

2.2.1 Background of the Government X

The Government X is one of the Provincial Governments of South Africa and has a population of 5 287 863 which accounts for 14% of the total South African population on 129 370 km² of land. The people speak Afrikaans, isiXhosa and English as the main languages. It has the mandate to increase economic empowerment for all the people of the Province, reduce poverty through promoting opportunities for citizens, promote local economic development, efficient and effective infrastructure development and maintenance, sustainable human settlements, improve individual and household capacity to respond to opportunity, improve efficiency and effectiveness in health, education, well-being and safety, sustainable resource use through greater spatial integration, effective public and non-motorized transport, responsive and effective governance. It is clear from the mandate that e-Government has a major role to play. The strategy of the Government X is to a large extent informed by the lessons learnt from past service delivery challenges. The key strategic objective "Building the best run regional government in the world" is seen as the foundation for creating an efficient, transparent, responsive and corrupt-free government that delivers cost-effective services to its citizens. This Government X adopts a transversal management system in order to achieve systems integration in their service delivery programmes. Their strategic objectives cut across traditional line functions. Three e-Government projects were investigated and these were:

1. Department of the Premier (Project 1): This department provides legal and corporate services to and co-ordinates some of the provincial affairs for the Premier, Director-General and other departments in

the Government X. From the Department of the Premier a project which focused on developing a portal which would provide the citizens with online access to government information.

2. Department of Health (Project 2): The department of health has a comprehensive package of health services to the people of the province. Among others, they offer emergency health services, mental and women's health services, baby and child and rehabilitation services. The project is an online bursary applications solution to integrate hospital and patient records across the province and for purposes of subsidy allocation and deployment of health care resources.

3. Department of Education (Project 3): The Provincial Government's Department of Education is responsible for public schooling in the province from grade one to twelve. They provide specialized education services and subsidize and support grade R education. This department further provide further education and training (FET) and adult basic education and training (ABET). The project is to integrate educator recruitment system that seeks to streamline and redistribute educators across the province for strategic decisions and interventions where necessary.

2.2.2 Methodology

The methodology is a multiple case study of 3 projects using interpretive paradigm as a philosophical assumption; implying that reality is socially constructed. The underlying objective of this approach is to understand and interpret the social phenomenon, i.e., the e-Government readiness of Governments for successful implementation of e-Government projects. The type of primary data collection instrument used was interviews and all interviews were recorded and later transcribed and coded. Project documentation, Government X ICT strategy, Annual Performance Report, official minutes from legislature, public notices, Newspaper articles were used as secondary data. The following were interviewed:

Table 3. Unit of Analysis

Project type	Management			Team Leaders (TL)	Analysts (BA)	Developer (Dv)	Users	Total
	Senior (SR)	Middle (MM)	Content (CM)					
Project 1	1	1	1	2	1	2	1	9
Project 2	2	1	1	1	1	-	1	7
Project 3	1	2	1	2	1	1	1	9
Total	4	4	3	5	3	3	3	25

In terms of ethical consideration in collecting data, permission was granted by Government X to carry out interviews from all participants on the e-Government project implementation that form the actor network. Special permission was also granted by senior management in order to gain access to all documents that were required for content analysis as secondary data collection. Consent was also sought from all interviewees without any coercion to go through the interviewing process. The interviewees were reassured of the purpose, confidentiality and anonymity at the start of each interview. Meaning of contents of the interviews was explained and identities of interviewees were made confidential. The interview schedule went through a standard approval process by the Ethics Committee which scrutinised all the research questions, interview questions, guidelines etc.

3. Results and Discussion

The analysis followed the process recommended by Devlin (2006) as:

• The responses were condensed into a table, arranged by question using an excel spreadsheet. Each interview question was typed into a separate line and each response was labelled according to the project code and respondent code. The coding table also shows the coding of all projects and respondents accordingly. The coding process, involved reading the responses one by one and line by line, highlighting relevant words, phrases or sentences. The list constituted a set of organized, raw data, known as the data set.

• After browsing through the transcripts which were organized in a spreadsheet, the researcher then noted any first impressions and trends the data may have revealed. When categories were developed inductively, explanations, grounded in the data, were developed. As suggested by Berg (2007), the use of excerpts to document the interpretation made by the researcher, were used.

• Responses which could not be linked to a specific question but were relevant to the research were coded and categorised.

• In analysing the data, reference is consistently made to both the literature and the theoretical framework.

(a) Problematization as a legal infrastructure

E-Government projects begin by defining project objectives and the selection of actors (Gunawong & Gao 2010). The same has been with the 3 projects in this study. As already alluded to in

this paper, problematization is where the focal actor defines the nature of the problem forcing the other actors to accept a way forward. The ANT as an underpinning theory has been used in this study to show how actors in a network of aligned interests interact to produce e-Government systems that will alleviate problems associated with service delivery. The focal actors have identified their interests by framing the problem. In the case of project 1 the interest of the focal actor was the need for citizen to have access to information relating to services offered by Government X. This interest was in line with the mandate and strategy of Government X already discussed. One senior manager said:

"The problem was that citizens did not really know what services the Government offered. They did not have access to information. Actually my focus is on giving information access to the public via the online and needed to improve communication"

In the case of projects 2 and 3 the common problem was that of having to deal with paper based applications. It became a problem to handle and even track these applications using manual systems. Basically the departments could not handle the amount of work associated with the handling of applications and were compelled to come up with solutions. One of the senior managers said:

"So, first two vacancies were horrendous for me when I started in this department because we received 17 000 manual applications per vacancy lists which the team had to work through and capture on the database. So it took us two to three weeks to confirm how many applications we received. We used to close at four o' clock in the afternoon. We had long queues so people would be trying to run around to apply on time or post them. The teachers are at school till three o' clock so they had an hour to apply."

The Content Manager and the Business Analyst said:

"It was important to actually understand the kind of information which could be published, by law or as a policy."

(b) Obligatory Passage Point (OPP) as a process infrastructure

With regards to the project 1, some Departments of Government X were against it. They did not see the need to have their websites redesigned – if not broken don't fix it. The opportunity was that there was not a standardized way of presenting Government information to the public via the websites even if those websites worked well. There was still a need to redesign those websites. To arrive at a point where there was no resistance, focal actors had to establish the OPP. According to (Callon 1986), the focal actor sets-up an OPP in order to align the interests of different actors. In the case of project 1, there was a mandate that all Government X Departments had to have their websites redesigned to

reflect the rebranding of the Government X and the design was to be undertaken by the Department of the Premier of the province. The rebranding was linked to the key strategic objective of the Government X; i.e., "Building the best run regional government in the world." This forced all Departments to comply and become part of the project hence they were compelled to cooperate with the Department of the Premier in making arrangements for centralized portal. By accepting to align interest, actors were, in essence, also accepting that there would be changes to processes (i.e., process infrastructure) to accommodate the interests of the focal actor. In the case of Project 3 they had to reengineer their processes to be able to work under the new conditions. A number of managers said:

We had to change the processes as well to change from paper to online application. Phase two was the School Governing Body (SGB) process they had to access the online short listing or print them out.

(c) Interessement as an institutional infrastructure

A successful problematization leads to the next stage of the development of the ANT, interessement where the focal actor locks the other actors into place by imposing self and defining the linkages between the others (Gunawong & Ping n.d.). The aim of the focal actor at this stage is to stabilise the other actors. In the context of e-Government the realignment of interests was to accept the e-Government initiative as necessary to address already discussed in problematization. E-Government is a way of improving government processes, connecting citizens, and building interactions with and within civil society (Heeks, 2001). Activities leading to this outcome are not only engaged when the e-Government system is ready for use. It is imperative to get buy-in from the stakeholders from the beginning of the project. Senior managers were used to introduce the project vision to the rest of the stakeholders. Most of the stakeholders were represented in project meetings where the project objectives were communicated and vision chanted. A middle manager said:

Project meetings were held for all stakeholders because of the benefits of the project to them and the aim was to make this project an official one. Project teams such as developers, analyst, system controller, managers and directors working on the system were also invited. Management also needed to be there in order for us to know which input was needed.

As Almarabeh (2010) states, e-Government is about how government organises its administration, rules, regulations and frameworks set to carry out service delivery and co-ordinate, communicate and integrate processes. Given this view about e-Government, it is important to ensure that there is

awareness of what is happening before it actually happens. One Senior Manager said:

There was some communication, and consultation with stakeholders. There were pamphlets distributed at train stations and the project was made to be a big thing in the Province. There was radio and newspaper marketing that was done. There were also roadshows that were aimed at creating even more awareness about how things were changing.

So the project meetings were part of the standing meetings of the Government X and were a key performance indicator for all managers.

(d) Enrolment as a leadership and strategic thinking

This stage of the network ensures that the actors are assigned to specific roles and responsibilities so that their inclusion in the network is justified. It is important for actors to understand the significance of their role in the network of aligned interests. Inscription serves to strengthen the enrolment of the actors and to ensure that the actors do not betray the focal actor. Several factors were considered to impact the respondent's decisions to take part in the e-Government projects. These served to define the collective responsibility of the human actor in the e-Government network of aligned interests. Applying the notion of collective cognitive responsibility (Scardamalia, 2002), it became a group effort with all the members and not just centered on the leader. Most managers indicated:

We were playing our roles which we were employed for and coming up with the ideas. I went as far as training the person although it wasn't my job. It was fulfilling knowing I was part of something that would benefit the citizen. We were always encouraged by what we wanted to achieve with the website. We always had the citizen in mind. There was a sense of pride of knowing that we were doing something that will benefit someone out there in the Western Cape. This was encouraging. The project was part of our deliverables which we had to achieve. There were frequent updates on the progress of the project given to stakeholders. They constantly reminded of the benefits of the project.

Self-efficacy which can be seen as one's belief in their ability to complete a task (Bandura, 1994), came out strongly in the project team. The following statement highlights what one manager said:

Yes, the roles were clear. It was a new thing that the government was doing. In some areas of work there are very clear roles because people were doing this for a while. In this project, there were a number of new and innovative things like it was not like a job description could be downloaded from the internet and understood by everybody. Job descriptions for some roles did not exist and had to be defined. There was willingness to learn in the roles because it was quite new that we were doing. People really believed in themselves.

Furthermore, enrollment in a network of aligned interests is one of the ways showing that there is development in the network stability towards irreversibility. Stakeholder buy-in was critical as at this stage even though it had some challenges. A number of managers interviewed said:

I think the big picture wasn't understood yet and change management was done well enough. There was a lot of enthusiasm because we could realize the visible outcome of the project. There were few who thought it was extra work and those who thought it was just becoming a burden to them because they did not see the big picture. I would say citizens did buy-in because of the growth in numbers and the interaction.

(e) Mobilization as a human and technology infrastructure

Mobilization was seen as irreversibility and as the final stage of the creation of the e-Government network of aligned interests. It is the desired state to achieve stability of the network and for human actors it is the social factors that strengthen the network of aligned interests so that it does not change in response to changing circumstances. Most senior managers commented as follows:

We now have a lot more sophistication in our relationship with our clients. We are now able to manage relationship very well. The content is maintained extremely well now. Our governance around the portal is very strong. We got the right services grouped together to implement e-Government. Information is readily available for our clients.

Over all it was successful. Overall it was successful, there were glitches here and there but that was all dealt with in post migration. All of those things were looked into in post evaluation and those issues were identified after the migration took place. I would say that that it was a success; this system was adopted to be a transversal system. All the government departments and bursaries systems are now able to use it. It was successful and good learning area for us.

The handover of the project to the Department of the Premier and all departments was an indication of not return to the old ways of doing things. Some of the Managers commented as:

There was a big launch function. The CIO spent a lot on the fancy dinner where there were speeches etc. This was for the internal staff. We also demonstrated to the schools, the department of health, head of departments (HODs), the management of the department up to the director of human recourses. We launched it with all the directors and chief director to make them aware of it. As well as on our application form and website it is on there. Also when the students signed the bursary contracts they had to capture their details online they also experienced it themselves.

4. Recommendations

Like any Government whose main mandate is to deliver basic services to the public, the e-Government initiatives are to enable Governments to improve service delivery, integrate and manage relationships with the citizens. Therefore, the readiness of any developing country or Government to successfully implement e-Government initiatives can be studied using the concepts of moments of translation (MoT) and irreversibility of ANT. MoT therefore can be used as a lens through which to understand and interpret the readiness of Governments to successfully implement e-Government projects to improve services to its citizens. MoT and Irreversibility used to create a general framework, further demonstrates over time and space the degree of readiness (see Figure 3) for successful implementation of e-Government projects. The outcome of the study recommends the following:

(a) Legal and Process infrastructure

It became evident that the changes that were brought about by the *e-Government* projects required development of new policies or revision of existing ones. Apparently this is an exercise that needs to be done quite early in the project as policies are a form of agreements on how things are done. There should be no gap between what the policy says should be happening and the e-Government project plan (Trusler, 2003). These gaps in policy are considered as inhibitors of success in e-Government implementation. Policies are an important component in determining performance. The study also showed that actors understood policy as a component of e-Government which had to be addressed at early stages of the planning of the initiative hence it came up at problematization stage of the development of the network. Furthermore, policies were seen as tools that were used to get actors to a common ground and understanding of the project. This was the case with the projects 1 and 3. The study also showed that the ultimatum that came from the Department of the Premier to redesign the websites to create a centralised portal for all Departments across the Provincial Government was the strength for the aligned interests. In view of e-Government projects, the project must be linked to a key strategic objective of the Government and should be the basis for rebranding the Government's service delivery strategies. The latter initiates changes to align processes. This is the formalization of the OPP – a means by which the focal actor is able to integrate and manage relationships with actors into one vision. Given Figure 2 and 3 below, it is clear that acceptance of the focal actor's interest must be irreversible and therefore all stages of MoT must be followed, iteratively, to complete problematization before interessement until reaching irreversibility.

(b) Institutional Infrastructure

The main objective of interessement is to develop acceptance of changes that the e-Government projects will bring i.e., awareness as a means to facilitate change for e-Government which serves as a glue that holds all other components of the e-Government project together - the establishment of a new institutional infrastructure. The awareness and the buy-in for the e-Government initiative was driven from the rebranding of the Government service delivery strategy using the phrase "Building the best run regional government in the world" to align diverse interests. Table 2 and 3 also illustrate the need to go through all the stages of MoT iteratively, before the next major stage (i.e., enrolment) of MoT to ensure all diverse interests are aligned to the focal actor's interest of building the best run regional government in the world.

Figure 2. Readiness at each stage of MoT
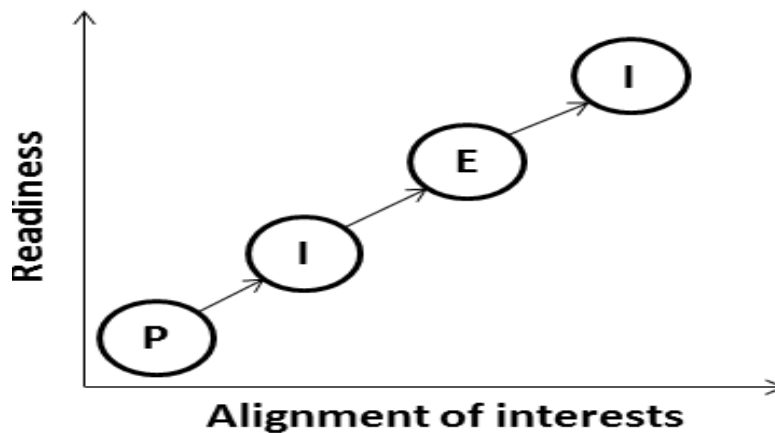
Figure 3. Degree of readiness for successful e-Government Projects
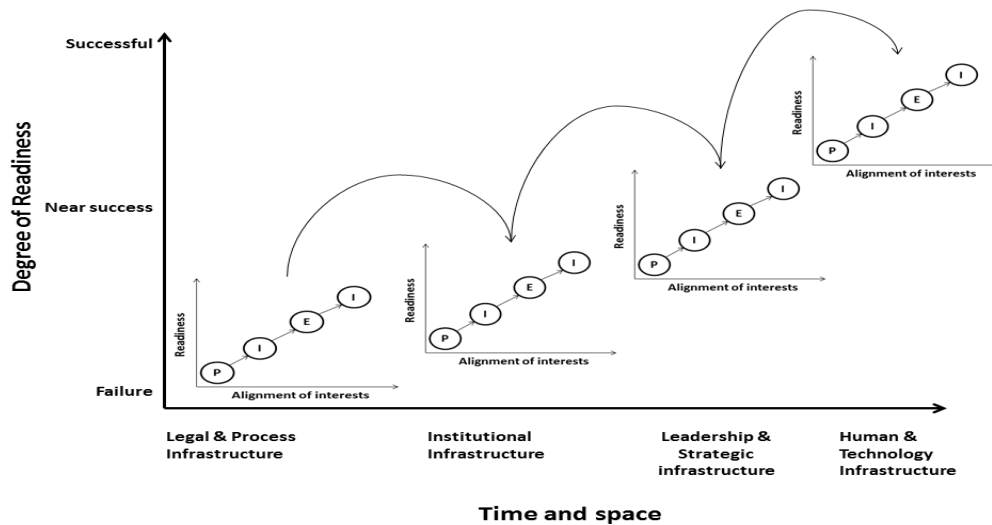
(c) Strategic leadership infrastructure

Much as Government bureaucracy is seen as a means to ensure corporate governance, many employees saw bureaucracy to have effect on e-Government as initiative. In the view of this study, the use of policies and specific guidelines and where necessary to suspend or do away with existing policies and regulations like to impact the e-Government initiative as an issue of strategic leadership. Therefore given the results of the interviews, the ability of senior management to review existing policies and regulations to align with the key strategic objectives of the Government mandate and that of the objectives of the e-Government was critical for the success of e-Government initiatives. Furthermore, making the objectives of the e-Government project a key performance indicator (KPI) of all managers strengthened the strategic leadership infrastructure. The KPI empowered senior management (Stanforth, 2006) to drive project meetings at all levels to ensure understanding of the benefits of the project, acceptance of and participation in the project by all stakeholders. Given figure 2 and 3, different project meetings at different levels which embraced all stakeholders helped to obtained extensive buy-in across government and users.

(d) Human and technology infrastructure

Irreversibility is a state of stability of network of aligned diverse interests. In the context of e-Government initiative and in particular this study, e-competency (i.e., IT related skills and knowledge) was critical. Also, change in processes to align with focal actor's interest by other departments led to change in non-standard technology platforms and design principles to one enterprise architecture. The new e-competencies and enterprise architecture constituted the human and technology infrastructure.

The recommendation is that the success of e-Government projects depends on redefinition of e-competency needed and the establishment of an enterprise architecture strategy. This identification, redefinition and establishment are done iteratively i.e., the state of stability of the e-Government network or state of irreversibility is achieved through its own MoT as illustrated by figures 2 and 3 above.

5. Conclusion

5.1 Contribution

The theoretical contribution of this paper is the application of the concept of Moments of Translation and irreversibility (MoT) of ANT as a lens through which one can study the interplay between role players or stakeholder of a socially constructed phenomenon such as e-Government readiness. The approach which encapsulates the entire research effort could serve as a guide for effective implementation of e-Government projects to improve service delivery to the public. It is not a "silver bullet" per se and as such does not guarantee successful implementation of e-Government initiatives, but demonstrates the likelihood of increased success. Further contribution is to ICT for development research where the application of interpretive philosophy as a research strategy using multiple case studies and interviews for data collection can be applied to understand and interpret the interplay between role players. MoT guided the findings and discussions of data collected from conceptualization to implementation. The contribution therefore is the way in which the concept of MoT was applied to study the socio-technical processes in the case studies of e-Government projects. It is arguable that this paper provides a different dimension to understanding and

interpretation of failures of e-Government projects to other researchers involved in similar projects. It is exciting and very developmental for Government ICT related projects that seek to improve service delivery to its citizens to use underpinning theories instead of just relying on literature. It must be noted that these underpinning theories do not come with a method of how to make use of them. The practical contribution is one of a normative approach which could inform the process of initiating e-Government projects from conceptualization to implementation and post-implementation support. However, despite the in-depth and rich social theories and literature available on ICT related projects success and failures and in particular e-Government projects, this could facilitate a new process. Hence it is envisaged that this study will address this limitation. It must be emphasize that the application of MoT as a normative approach cannot and will not guarantee success of e-Government projects, but it is expected that its use as a lens could increase the likelihood of success. Another practical contribution is the detailed insight provided by the case study which revealed that e-Government initiatives in developing countries should be linked to rebranding of key strategic objectives/mandate that all stakeholders can relate to – drive integration and manage relationships across all parties to be affected by the project. According to Twum-Darko (2014, p.518), "this will then help increase the social integration of technology initiative and, hopefully, its institutionalization."

5.2 Limitation and further research

One major limitation is the fact that there is very little application of MoT as a lens in studying the challenges impacting on e-Government related projects in Africa. This has implications for further research work. Although three (3) extensive e-Government projects were used to provide a general view of degree of readiness by governments to conceptualize and implement e-Government initiatives successfully, it requires further research to validate it with more e-Government projects and in different regions. A second limitation is the temptation to transfer these results into other contexts or countries. Although, this study was conducted in a region or province of South Africa that won the best design city in the world in 2013 and as such has certain economic development fundamentals, the methodology and the lessons learnt cannot just be transferred or replicated. Drawing from Twum-Darko's (2014, p.519) argument, using such a normative approach requires architects of e-Government projects to be flexible in their thinking and action to make them to identify challenges or the unexpected to improve the iteration process at various stages of the network of aligned diverse interests. As a final limitation, it must be noted that MoT was applied in retrospect. It would have been useful to

have followed or observed the e-Government project conceptualization and implementation of Government X and how the interplay between the actors as role players or stakeholder evolved. Furthermore, capacity and skills problems will continue, Governments will continue to reform, and strategic objectives or mandates will be amended to create different pictures. The normative approach to determine the degree of readiness of Governments to e-Government projects is a continuous development and will require minor adjustments to the application of MoT as a lens to increase the understanding and interpretation of likelihood of success.

References

1. Aichholzer, G. (2004). Scenarios of e-government in 2010 and implications for strategy design. Electronic Journal of eGovernment, 2(1), 1–10.
2. Almarabeh, T. (2010). A General Framework for E-Government : Definition Maturity Challenges, Opportunities, and Success, 39(1), 29–42.
3. Bhatnagar, S. (2000). Social implications of information and communication technology in developing countries. The Electronic Journal of Information Systems in Developing Countries, 1(4), 1–9.
4. Callon, M. (1986a). Some elements of a sociology of translation: Domestication of the scallops and the fishermen at St Brieuc Bay', in J Law (ed.), Power, Action and Belief: A New Sociology of Knowledge? (pp. 196–233). London, Boston and Henley: Routledge and Kegan Paul plc.
5. Callon, M. (1986b). Some elements of a sociology of translation: domestication of the scallops and the fishermen of St Brieuc Bay. In Law, J. (ed) Power, Action and Belief: A New Sociology of Knowledge? Sociological Review Monographs, 32, 196–233.
6. Callon, M. (1991). A Sociology of Monsters, Essays on Power, Technology and Domination. London: Rutledge.
7. Callon, M., & Latour, B. (1981). Unscrewing the big Leviathan: how actors macro-structure reality and how sociologists help them to do so. In. K. Knorr-Cetina and A. V. Cicorel (Eds), Advances in social theory and methodology: Toward an integration of mic.
8. Gunawong, P., & Gao, P. (2010). Understanding eGovernment Failure: An Actor-Network Analysis of Thailand's Smart ID Card Project. In Pacific Asia Conference on Information Systems (PACIS) (pp. 772–784).
9. Gunawong, P., & Ping, G. (n.d.). Challenges of eGovernment in Developing Countries : Actor-Network Analysis of Thailand's Smart ID Card Project.
10. HEEKS, R. (2001). Understanding e-Governance for Development (No. 11). Manchester.
11. Heeks, R. (2002). eGovernment in Africa: Promise and Practice. Africa.
12. Heeks, R. (2003). Most eGovernment-for-Development Projects Fail : Policy. Manchester.
13. Heeks, R. (2004). eGovernment as a Carrier of Context. Analysis. Manchester.

14. Hunnius, S., & Schuppan, T. (2012). Competency Requirements for Transformational E-Government. Computer (pp. 1–10).
15. Latour, B. (1986). The Powers of Association in Law, J. (ed), Power, Action and Belief: A New Sociology of Knowledge? (R. & K. Paul, Ed.). London, UK.
16. Latour, B. (1987). Science in action: how to follow scientists and engineers through society. (O. U. Press, Ed.). Milton Keynes.
17. Law, J., & Callon, M. (1992). The life and death of an aircraft: a network analysis of technical change. In Bijker, W.E. & Law, J. (eds) Shaping Technology/Building Society: Studies in Sociotechnical Change, pp. 21–52 (Cambridge, MA: MIT Press).
18. Lessa, L., Negash, S., & Belachew, M. (2012). Steering e-Government Projects from Failure to Success: Using Design-Reality Gap Analysis as a Mid-Implementation Assessment Tool. Interpretation A Journal Of Bible And Theology. Manchester.
19. Mähring, M., Holmström, J., Keil, M., & Montealegra, R. (2004). Trojan actor-networks and swift translation : bringing actor-network theory to IT project escalation studies. Information Technology & People, 17(2), 210–238.
20. Mpazanje, F. T. H. (2009). Towards understanding as-lived experiences in Information Systems projects : An Actor-network Theory perspective. Network. University of Cape Town.
21. Nijland, M.H.J., 2004. Understanding the use of IT evaluation methods in organisations. London School of Economics and Political Science. Available at: http://www.rug.nl/staff/e.w.berghout/2004_nijland_un derstanding_the_use_of_it_evaluation_methods.pdf.
22. Reich, B. H. (2007). Managing knowledge and learning in IT projects : A conceptual framework and guidelines for practice. Project Management Journal, 38(2).
23. Sarker, S., & Sidorova, A. (2006). Understanding Business Process Change Failure: An Actor-Network Perspective. Journal of Management Information Systems, 23(1), 51–86.
24. Schuppan, T. (2009). E-Government in developing countries: Experiences from sub-Saharan Africa. Government Information Quarterly, 26(1), 118–127. doi:10.1016/j.giq.2008.01.006
25. Stanforth, C. (2006). Analysing eGovernment Implementation in Developing Countries Using Actor ¬Network Theory. Manchester.
26. Stanforth, C. (2006). iGovernment Analysing eGovernment (No. 17). Manchester.
27. Stanforth, C. (2007). Using Actor-Network Theory to Implementation in Developing. The Massachusetts Institute of Technology Information Technologies and International Development (Vol. 3, pp. 35–60). Manchester.
28. Tatnall, A., & Gilding, A. (1999). Actor-network theory and information systems research. In In Proceedings of the 10th Australasian Conference on Information Systems (pp. 955–966). Wellington, NZ.
29. Trusler, J. (2003). South African E-Government Policy and Practices: A Framework to Close the Gap 1 E-Government Policy in South Africa Current Practices of Government in South Africa. In Electronic Government (pp. 504–507).
30. Twum-Darko, M. (2011). The role of information systems in legislation led reform : a case study in the context of the new municipal rates Act of South Africa. LAP Lambert Academic Publishing; Germany.
31. Twum-Darko, M. (2014), "Factors influencing readiness for transformational e-Government: A perspective of Local Governments in South Africa", Journal of Public Administration, Vol. 49, No 2, pp.512 – 523
32. Walsham, G. (1997a). Actor-network theory and IS research: Current status and future prospects. Information Systems and Qualitative Research, 466–80.
33. Walsham, G., & Sahay, S. (2005). Research on information systems in developing countries. Information Technology for Development, 12(1), 7–24.