Emergent Digital Era Governance: the role of the 'institutional entrepreneur' in enacting transformational change

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Abstract

As e-government matures the realisation of its potential to enact organisational change in the public sector remains unclear. This study examines e-government towards Digital Era Governance (DEG) and the actors involved in this transformational change. We draw upon the concept of 'enactment' as a lens to provide insights into relevant theoretical issues. These are operationalised through an enhanced Technology Enactment Framework (TEF) to consider reforms to explore the DEG environment and, specifically, the interventions of the CIO on e-government policies. We employed a case analysis approach from public sector authorities in the US States of California and Nevada with data from CIOs and other key informants. Our findings reveal how public sector CIOs adopt the role of an 'institutional entrepreneur', who demonstrate a series of initiatives augmented through identified behaviours. These relate to proactive community mobilisation (leadership, member focus) and legitimisation (discourse, success stories). We outline the policy implications of DEG and the risk factors of senior managers who enact these processes towards complex technological change. Furthermore, the characterisation of institutional entrepreneurial enactment appears to be extremely beneficial to the transformation to DEG within any contemporary public sector context.

Keywords: Digital governance, Technology enactment, Institutional entrepreneur,

Transformational change

1. INTRODUCTION

The earlier concept of New Public Management (NPM) reforms were clearly characterised by attention to prevailing efficiency gains adopted and practiced within the private sector (Bekkers & Homburg, 2007). It is recognised that NPM requires an environment for government which captures and perpetuates a culture of enterprise and competitive behaviours (Kim, 2010). Indeed, much of the current information and communication technology (ICT) literature, relating to public sector contexts, draws frequently upon private sector frameworks (Cordella & Bonina, 2012). Extant studies commonly refer to re-engineering approaches (Weerakkody, Janssen, & Dwivedi, 2011), which argue for technology-enabled solutions to service delivery issues. Emerging models of 'electronic' government (e-government) are increasingly recognised and represented as 'digital era governance' (DEG). Margetts and Dunleavy (2013) characterise one critical theme from this approach, i.e. 'Digitalization covers the adaptation of the public sector to completely embrace and imbed electronic delivery at the heart of the government business model …'. The focus is principally around efficient public information and internal administration of service delivery, essentially enabling online facilities (Dunleavy, Margetts, Bastow, & Tinkler, 2006; Margetts & Dunleavy, 2013). This presents extensive citizen interactivity which fulfils early predictions of digital government evaluations and potential benefits (Bekkers & Homburg, 2007).

Nevertheless, there is significant scepticism about whether DEG is able to evolve through other important phases towards genuine government transformation. Norris (2010), for example, predicts that in 2020 digital government will not be significantly different from today's e-government, with a similar range of transactions and degree of interactivity that is currently available, and only limited transformation. Moreover, Norris (2010) suggests that technology applications will be largely predetermined, institutionalised and routinized so that it is no longer prefixed with 'electronic' but principally just government. Studies of

technological innovation and diffusion (e.g. Zhu, Kraemer, & Xu, 2006), further suggest that the needs and characteristics of the organisation dramatically affect the ways in which technologies are implemented and the extent of their impact. The last decades have provided many examples of how attempts to transform the public sector have failed because of embedded norms, jurisdictions, bureaucracy, poor senior leadership and complexity of reforms (Cinite, Duxbury, & Higgins, 2009). IT-enabled changes to public sector organisations are not self-evident, but are inevitably refracted through the formality of existing institutional practices.

E-government still remains defined in quite narrow terms – mainly through managerial control and cost reduction (Chadwick, 2006). Researchers have noted that no significant progress has been recently made in the field of e-government, and many programmes have proven to be disappointing (Hardy & Williams, 2011). Luna-Reyes and Gil-Garcia (2011) suggest that where e-government projects fail to deliver on their promises, this largely results from a lack of understanding about the relationships between institutional arrangements, organisational factors, technologies and socio-economic contexts. The main aim of this paper, is to generate new insights on the multi-faceted relationships between these varied and complex factors and DEG enactment. In order to do so, we must first identify what DEG "looks like" in practice; evaluate whether DEG has been implemented; and then to identify the factors in the process of DEG transformational change.

Here, we extend and apply Fountain's (2005) Technology Enactment Framework (TEF), which draws on actor-centred and institutional theory, governance, and bureaucracy to understand in more depth the relationship between actors, organisational and institutional arrangements on the implementation of ICT in the public sector. We operationalise and apply the extended TEF to eight local government case studies in the US states of California and Nevada. We adopt an interpretive and qualitative approach using multi-case method, to

unpack in more depth the complex relationships between the technology enactment factors. We focus in particular on the role of the CIO and IT system decision-makers and we also investigate the impact of e-government policies on DEG enactment. In so doing, our paper illustrates the differences in enacting DEG in each of the cases presented.

The remainder of this paper is organised as follows. The next section includes a brief review of institutional theory, the technology enactment framework and the role of the CIO in the process, and e-government policies. The methods for gathering and analysing the data collected are presented for operationalising the extended TEF. The discussion section collates the findings and presents the final DEG Enactment Framework. Finally, we present the implications of our study and conclusions.

2. LITERATURE REVIEW

Early e-government literature adopted practitioner-led models largely based on Nolan's (1979) Stage Growth Model hypothesising development from online information → communication → transaction → integration → transformation/participation/digital democracy (Gonzalez-Zapata & Heeks, 2015; Heeks & Bailur, 2007). However, this is misleading as the evolution of technology adoption is neither linear nor sequential but is rather erratic with significant overlaps (Coursey & Norris, 2008; Heeks & Bailur, 2007; Norris, 2010; Yildiz, 2007). Much of this early literature was mainly influenced by practitioners and world organisations, such as the United Nations, with an innate politically or commercially motivated bias towards initiating the utilization of the Internet to improve 'their' governing process (Coursey & Norris, 2008). Yet, critics have identified a lack of clarity regarding the definition of fundamental e-government concepts amongst government, citizens and related stakeholders (Irani, Elliman, & Jackson, 2007). If placed along a continuum, these definitions span from ICT being a means for delivering more efficient and effective government services (Wonglimpiyarat, 2014), to a means for transforming

government and governance (Grant & Chau, 2005). What is more, few studies offer explicit theories relative to e-government growth and development, and those that do, have been judged to be largely descriptive, normative and non-predictive (Hardy & Williams, 2011).

Prior research on public sector organisations has focused on organisational behaviour through organisational change, learning, and management activities. Although not specifically related to digital governance, consistently articulated themes stress the importance of the role of 'leaders' in any kind of organisational transformation. Public sector studies have also found that managerial capabilities and commercial attitudes significantly impact public sector management performance (Chen, Pan, Zhang, Huang, & Zhu, 2009; Damanpour & Schneider, 2006). Furthermore, networked governance is seen as an alternative to 'managerialism' in public administration, an attempt to move away from the predominant competitive private sector ethos and agendas that has underpinned public sector policy for over a decade.

Margetts and Dunleavy (2013) introduce the concept of digital era governance (DEG), highlighting contemporary technologies as drivers for innovative and competitive government. While acknowledging that any change is fraught with complexities, complications and difficulties, principally the potential for digital technologies is available to transform government to become more agile, less institutionally complex, more administratively simplified and automated, more responsive to citizens, and more capable of social problem-solving (Chadwick, 2006; Fattore, Dubois, & Lapenta, 2012; Fountain, 2001; Rhodes, 2011). The paradigms of public sector management – both traditional and new public management –do not comfortably fit with the emerging DEG, or networked governance. There is, therefore, a need for a 'new' paradigm: one that incorporates the nature of emerging systems in the management of public services and programmes, addresses a different way of working for public sector participants, and one that can "steer society in new ways through the development of complex networks and the rise of more bottom-up approaches to decision

making" (Stoker, 2006, p. 41). Table 1 summarises the differences between the different paradigms of traditional public administration and NPM, along with the paradigm of DEG (Dunleavy et al., 2006) [1] which will be later developed as an analytical tool in our framework.

Table 1: Summary of Public Sector Management Paradigms

	Public Sector Management paradigms		
	Traditional Public Administration§ (Traditional Government)	**New Public Management§ (E-government)**	**Digital Era Governance***
Key Objectives	Politically provided inputs; services monitored through bureaucratic oversight	Managing inputs and outputs in a way that ensures economy and responsiveness to consumer	*Reintegration*: reversing separate discrete corporate hierarchies in an antithetical response to NPM *Holism*: simplify and change relationships between agencies and clients. Developing agile government able to respond to changes in social environment *Digitalization*: to realise contemporary productivity gains from IT and related organisational changes beyond electronic channels as supplementary to conventional administrative and business processes. Genuine integration not piecemeal narrow joined-up governance. Citizen-oriented government. Visible organisational operations to personnel within and across government agencies, citizens and civil society. Less complex institutional and policy landscape. Increasing citizen autonomous capability for solving social problems
Role of managers	To ensure that rules and appropriate procedures are followed	To help define and meet agreed performance targets	
Approach to public service ethos	Public sector has monopoly on service ethos, and all public bodies have it.	Sceptical of public sector ethos (leads to inefficiency and empire building); favours customer service.	
Challenges of Efficiency (F), Accountability (A) and Equity (E)	(F) Break down complex tasks and get staff to follow procedures (A) Competitive elections provide leaders who can steer and exercise oversight (E) By treating all similar cases the same.	(F) Set tough performance tasks that the organization is encouraged to achieve. (A) Politicians set public goals and set targets and then hold managers to account for their delivery. (E) Offering a framework of responsiveness to users and setting targets to achieve fair access to services.	
Contribution of the democratic process	Delivers accountability: Competition between elected leaders provides an overarching accountability.	Delivers objectives: Limited to setting objectives and checking performance, leaving managers to determine the means	
Preferred system for	Hierarchical department or	Private sector or tightly defined arms-length public	

[1] While we acknowledge Stoker's (2006) suggestion that the paradigm of public value management as being suited to the emergence of a networked governance, its inclusion here is beyond the scope of this particular paper.

service delivery	self-regulating profession.	agency.	Support civil society stakeholders' actions facilitated by public managers

Adapted from §Kelly and Muers (2002); §Stoker (2006) and *Dunleavy et al (2006)

2.1 Technology Enactment Framework (TEF)

Institutional theory is increasingly being applied in the context of information systems research to study the complex relationships that exist between information technology, and social and organisational factors. Fountain's (2001) TEF is widely recognised as a valuable framework of analysis in this context (Cordella & Iannacci, 2010; Luna-Reyes & Gil-Garcia, 2011). Institutional theory provides a lens through which to investigate the complexities of 'bureaucratic politics amid network formation and technological change' (Fountain, 2001). It highlights how political agendas, organisational characteristics (emphasising the role of bureaucratic organisations in the public sector context) and existing arrangements shape the process of ICT implementation (Cordella & Iannacci, 2010; Wonglimpiyarat, 2014). For example, the characteristics of the Internet are influenced by the context of its use: the given organisational form (bureaucracy and networks) and existing institutional arrangements (cognitive, cultural, socio-cultural and legal) (Cruz-Jesus, Oliveira, & Bacao, 2012). As a result, the enabling technology is transformed into an 'enacted' social environment with outcomes that influence the cycle of transformational change. The TEF has been applied by scholars and sheds a powerful light on the various and complex issues of e-government. Most of these studies are informed by, rather than directly apply, Fountain's TEF leading to the emergence of further explanatory models. For instance, evaluating the interplay of different factors in different settings on relative success of state websites in the US (Gil-Garcia, 2006); understanding content creation differences across several public e-service providers in Mexico using dynamic simulation (Luna-Reyes & Gil-Garcia, 2011); uncovering the complexities of knowledge management in the process of public e-service development in Italy (Arduini, Denni, Lucchese, Nurra, & Zanfei, 2013). Fewer studies, have operationalised and applied the original TEF model, which is our objective here. Attempts to apply the original TEF in a DEG context have highlighted the impact of public policies in shaping choices for technology design and adoption. Cordella and Iannacci (2010) in their

eGovernment Enactment Framework, propose that these policies, which enable DEG, are a fundamental part of the enactment process and should be included as an entity within TEF. In their case study, they illustrate how, 'The outcomes of e-Government policies are therefore a combination of political, social and technological components that shape in a recursive interaction their outcome' (Cordella & Iannacci, 2010, p. 65).

While Fountain's contribution is acknowledged to be valuable in terms of providing a framework for understanding technology-motivated change and the interaction of technology, organisations and institutions, scholars (e.g. Bretschneider, 2003; Hoetker, 2002; Schellong, 2007; Yildiz, 2007) have noted its weaknesses. Most critically that TEF excludes any consideration to the existing well established socio-technical systems theory (Schellong, 2007). In addition, TEF has only a limited exposure to more recent aspects of structuration or institutional theories. Moreover, it does not address how actors may work together to overcome institutional obstacles to enable change in the functioning of government (Bretschneider, 2003; Schellong, 2007). Last, but not least, Fountain's original US cases also provide insufficient evidence of the general applicability of TEF (Bretschneider, 2003; Schellong, 2007).

Some of these limitations have been subsequently addressed by Fountain herself, in a revision influenced by actor-centred institutionalism (Okumara revisions in Fountain, 2005). In particular, she identifies three groups of actors that 'play distinctive but inter-related roles in technology enactment' (Fountain, 2005, p. 158). Namely, vendors and consultants responsible for objective IT; CIOs and IT decision-makers who have primary responsibility for system design; and policy-makers, mangers/administrations, operators and workmen who have a strong influence on organisational forms and processes. A further group of actors (citizens and business) has also been suggested by Schellong (2007).

Fountain admits that, *"these depictions simplify the complexities of actual governments and*

policy making process. They are meant to draw attention to the multiple roles involved in enactment and the primary point of influence exerted through each role." (Fountain, 2005, p. 158). She specifically highlights the neglect of the relationships between actors in groups B (CIO and IT systems decision makers) and C (policymakers, managers, administrators), which she considers to be crucial for project success. To address this gap, we focus on the CIOs and IT systems decision makers in the TEF. We argue for a further enhancement of the TEF through a new 'enterprise' dimension relating to the importance of CIO and system decision makers as a catalyst for the enactment of DEG, and build on the eGovernment Enactment Framework (see Cordella & Iannacci, 2010), which highlights the importance of e-government policy in the enactment of technologies chosen and designed in the public sector.

2.2 The Role of the CIO in the Enactment Process

The concept of 'enactment', initially articulated by Orlikowski (2000), identified managerial opportunities to 'translate' ideas and sense-making into practical objectives. Boudreau and Robey (2005) note features of the enactment process as relating to agency theory where human 'actors' attempt to achieve certain outcomes. The core feature of enactment is the behaviour of managers influenced by existing social norms, which are manifest in their individual responses to institutional events and structures (Feldman, 2004). In addition, enactment is contingent upon the contextual setting as managers respond to varying organisational demands (Chan, Hackney, Pan, & Chou, 2011). The subsequent interrelationship within the enactment process, through a consideration of available organisational capacity, was specifically noted by Wheeler (2002, p. 27) as '… the process to integrate, reconfigure, gain, and release resources (and) achieve new resources'. More recently, Chan et al. (2011, p. 535) reported that 'the potential of ICT systems to effect change is contingent on how they are enacted by human agents within the organisational context'. It is argued, in this respect, that we need to recognise the role of institutional entrepreneurs (Thompson, Herrmann, & Hekkert, 2015; Waldron, Fisher, & Navis, 2015) as

agents to enact the 'enterprise' process.

In the updated TEF, CIOs are incorporated as actors responsible for decision-making for IT systems, and are considered to have a more direct and strong influence on technology enactment (Schellong, 2007). It is therefore important to investigate the role of CIOs in the enactment process. Since the early 1980's, the role of the CIO has been developing and evolving from being purely that of a technical expert, to one that is an amalgamation of the IT specialist and management guru (Lawry & Waddell, 2008). Attributes of the CIO have been likened to those of a chameleon (Remenyi, Grant, & Pather, 2005), dealing with situations where they have to adapt to an ever changing environment; be able to envision the organisation as a whole entity; remain ahead in terms of technological development; and be resilient when unrealistic expectations and failures arise (Lawry & Waddell, 2008). While much of the research on CIOs has been drawn from the private sector, overall the process of management is similar, but the constraints and conditions of public versus private sector environments under which the CIOs operate, differ (Lawry & Waddell, 2008; Schneider & Vaught, 1993). In particular, more bureaucracy in terms of formal procedures for decision making, more aversion to risk, lower managerial autonomy to react to circumstances that arise in the public sector as they see fit (Boyne, 2002; Lawry & Waddell, 2008).

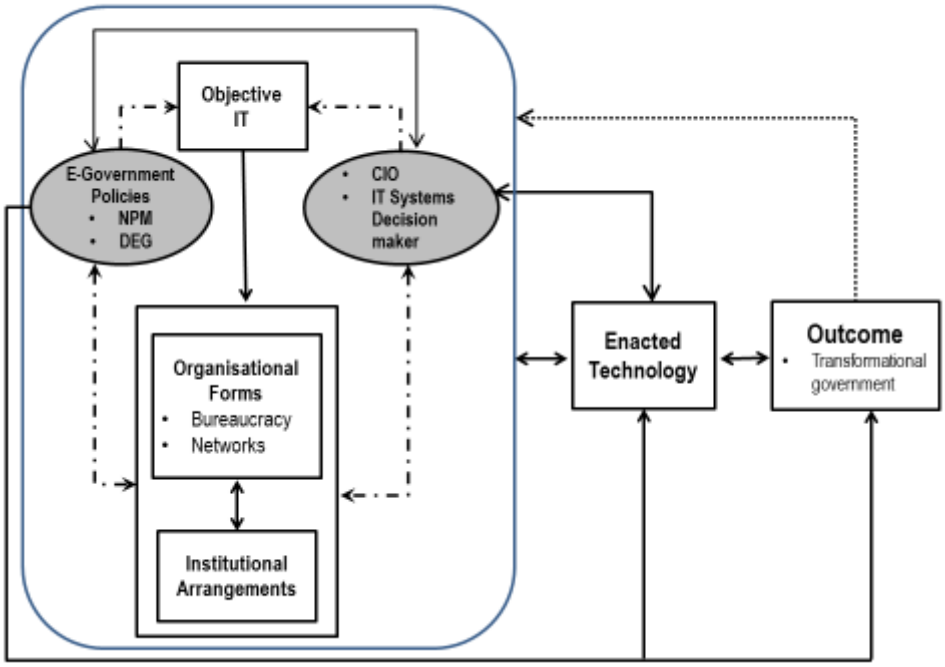
2.3 Enacting DEG: An Enhanced TEF

Within our study, the original TEF is adapted further to develop a more comprehensive understanding of DEG enactment by including both e-government policy dimensions (building on Cordella & Iannacci, 2010) and the role of the CIO (building on Fountain's 2005 TEF revisions) illustrated in Figure 1. This highlights the interrelationship between e-government policies, where existing institutional forms need to be enacted to support transformational DEG activity through a specific managerial role.

The central argument of our analysis is the concept of enactment, which transcends current

notions of 'technological determinism' as currently enabled through available and adopted systems. We explore further, through a series of empirical case analysis, how this enactment process may potentially be operationalised and the role of the CIO in this process.

Figure 1. Proposed DEG Enactment Framework



3. RESEARCH METHODOLOGY

Our research approach involved a qualitative case analysis to understand the process of the transformative potential of technology enactment in DEG. The case studies were located within the States of California (CA) and Nevada (NV) respectively[2]. The research sites reflect one of the most (2nd California) and least (42nd Las Vegas) innovative states (Bloomberg, 2013). These measures of innovation centre around science and technology (S&T) (e.g. S&T degree holders, professionals working in STEM; State R&D expenditure and public technology companies), and correlate with the respective State's standings in terms of digital technology practices. Institutions in our sampling frame are representative of a more advanced (California A-), and a less advanced (Nevada C) digital environment (CFDG, 2012).

[2] As with all empirical research, there is inevitably an element of convenience sampling due to opportunities for access to data and respondents by the researchers.

County government was used as our main unit of investigation, and we selected case counties that were leaders (in the top 10) or laggards (in the bottom 10) in digital government, according to the annual Digital Counties Survey (CFDG, 2009). County governments are political entities in their own right, and are considered to be 'important players in the federal system and beyond', operating inter-governmentally as significant service providers (Benton et al., 2007). There appears to be limited research on e-government within counties, and our study aims to provide a contribution to deeper understanding of these complex sites, which may act as exemplars for other public sector contexts.

3.1 Data Collection

During a six-month period (from September, 2013) we collected data from three main sources: interviews, observations and documentation. Data triangulation was achieved to enhance the likely rigour and validity of our interpretation (Yin, 2014). All the names of the case counties are anonymised to protect the confidentiality of the respondents.

Interviews

Chief Information Officers (CIOs) hold the remit for designing and implementing e-government/digital systems and effecting related reforms. We are, of course, conscious of the 'big-man' scenario here, where one individual holds the key to all the issues involved. However, our approach was an attempt to identify the nature of the role, and its impact upon the enactment process. County Chief Administration Officers (CAO)/CEO responsible for implementing local policy directives were also contacted to request interviews.

Of the 20 case counties selected, we contacted both the CIO and the CAO/CEO to request interviews. In total, 8 CIOs (7 in California and 1 in Nevada) and 2 CAOs (in California) agreed to be interviewed. The two CAOs that initially agreed to our requests for interviews, both later cancelled, having found that we had secured an interview with their respective CIO. In both cases, we were informed the CIO was the relevant person to discuss issues related to

digital governance and that they could add nothing further. Subsequently, we interviewed 8 CIOs on a one-to-one basis with each of the interviews lasting between 1-2 hours. In addition, we interviewed 10 key informants responsible for IT decision making such as IT managers, information and communication professionals and others. All interviews were transcribed verbatim and detailed notes were taken. The interview protocol included several open-ended questions intended to inform the DEG enactment process and operationalise the extended TEF model. For instance, the questions aimed to elicit respondent views on (i) existing online services to establish the current status of the enacted technology; (ii)'theoretical' meaning (CIO understanding) of transformational government and its practice in reality to understand what DEG looks like in practice and CIO perceptions; (iii) their role in the process to provide more depth and understanding of their responsibilities and sphere of influence; (iv) performance metrics and measures of online service to establish the policies and practices underpinning e-government management; (v) institutional factors and issues enabling/inhibiting transformational change to establish the organisational factors and institutional arrangement in the enactment of DEG. Respondents were also invited to make any additional observations or raise issues that had not been covered, which were also incorporated into the results for analysis.

Observations

Observations of each of the respective case county's websites were also made. The method of reviewing websites has been well established, and is standard for research into online government services (Dawes, 2008). Studying websites and web portals can be "considered key elements of successful e-government strategies" (Gil-Garcia, 2006, p. 2). They have been used by scholars as an indicator for enacted technology and organizational outputs (Gil-Garcia, 2006, 2012), and have included numbers of e-commerce systems, online services and digital state e-government scores. We adopt a similar approach in our study. Two researchers reviewed the websites and identified a common set of services provided across all the public

websites (to counter any local environmental bias). We developed a notional score for each of the services according to the degree of sophistication of systems and level of integration. Levels 1-3 are considered to be public service provider-led fixed processes forming the basis of e-government, and levels 4-5 are citizen-led entrepreneurial behaviour demonstrating initiatives for transformation to DEG (details are provided in the Appendix). An additional measure, 'agency', was included to note when a citizen was linked to an external website to access the service requested, indicating the lack of integration between public service providers (non-DEG). The data from these observations were compiled and a composite score, which included their Digital County Survey rankings and number of online services (following Gil-Garcia, 2006), was awarded to each case county. The scores were not intended as an absolute or scientific measure, but a representation of enacted technology, and thus an interpretation of the 'outcome' (transformation to DEG) in our adapted TEF model.

Documentation

The public sector produces a large amount of textual output of written and verbal communications in the form of policies, speeches, agreements etc. These are important artefacts in legitimising government activities, while demonstrating accountability to citizens by declaring institutional aims, plans, strategic objectives and actions. Despite this, very few public sector studies have used content analysis methods, which is a "research method that uses a set of categorization procedures to make valid and replicable inferences from textual data" (Fattore et al., 2012, p. 220). In our study, data was collected by searching for E-government policy documentation at Federal and State level to provide a context to our study. Documentation related specifically to each case county was searched for on their institutional website ensuring the institutional legitimacy of the documents which is core to the premise of the TEF. Furthermore, one of our CIO interviewees stressed the importance of web-based e-government policy documentation, *"I would say it [e-government] is on our webpage it is in all our policies and in our committee speak".* Any material directly related to electronic and

digital government including policy documents, strategies, speeches, executive directives and committee-meeting minutes was examined. This process yielded a very large number of records (over 100 documents) which were pooled and filtered using qualitative content analysis to consolidate words of text into fewer content categories based on explicit rules of coding derived from the literature and concepts of e-government and digital government under investigation (Harwood & Garry, 2003). A coding protocol was then developed in order to operationalise the concepts of the TEF in the context of DEG, and is explained in more detail in the following sections.

3.2 Data Analysis

Our data analysis was iterative. Following Glaser and Strauss (1967) and Miles and Huberman (1994), systematic, iterative comparisons of data, emerging categories and existing literature aided the development of an integrative theoretical framework.

Stage 1: Isolating broad categories within each case

From our data, we first compiled separate case studies of each county. We identified patterns and variances in the descriptions of impact of public management and the role of the CIO in the enactment process to better understand the potential of achieving successful transformational government (DEG). To assess the reliability of the generated open codes, we then involved a second coder, with considerable qualitative research experience. Disagreements were resolved through discussion between the first author and second coder.

Stage 2: Linking related concepts within each case

During this stage, we examined all conclusions derived from the initial coding and established links between and among previously stated categories, a process known as selective coding. We allowed concepts and patterns to emerge based on the primary data collected, as new categories were added and others were regrouped when further interviews were analysed

(Cassell & Symon, 1994). Information of how CIOs enact transformation (through examples of community mobilisation and cognitive legitimation) began to emerge at this stage, developing a conceptual link between the observed behaviour of CIOs in our cases and that of institutional entrepreneurs (Wang & Swanson, 2007) in DEG enactment.

Stage 3: Cross-case comparisons

To enhance generalizability (Firestone & Herriott, 1983), as well as to deepen understanding and explanation (Glaser & Strauss, 1967), we compared each category and its properties across cases. Our main intent was to compare and contrast community mobilisation and cognitive legitimisation by the CIOs across case firms. To assess the reliability of each dimension, we first involved the second coder. All disagreements were resolved through discussion. Second, we shared the results of the initial analysis with key informants at three case organizations and with an independent professional in the field, to assess whether the conclusions reached were plausible.

Stage 4: Connecting emergent themes and ideas with the theoretical concepts of the literature and operationalising the modified TEF

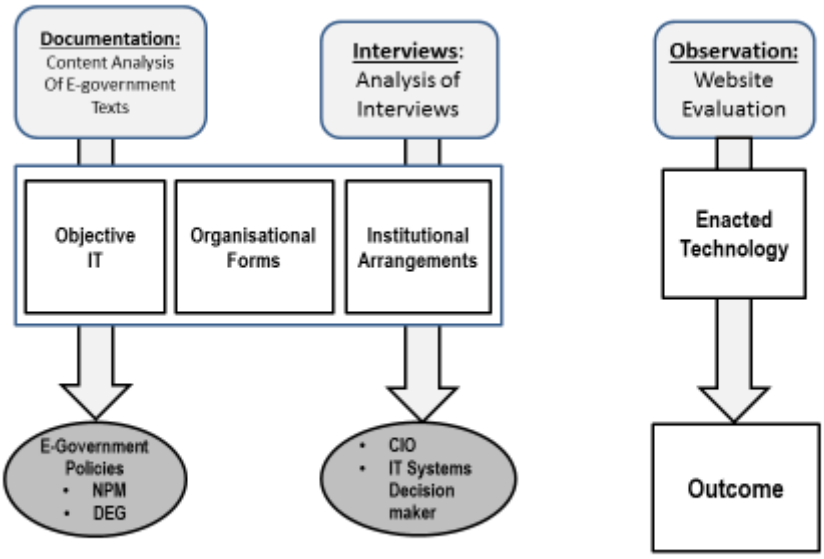
Our data analysis moved back and forth between the emerging themes and extant literature to build explanations (Yin, 2014) for our findings, and operationalise the framework for enacting DEG.

4. OPERATIONALISING THE MODIFIED TEF

The three types of data collected and analysed were then combined to provide empirically driven insights to the enactment process in our cases, by operationalisation of our modified TEF. Figure 2, illustrates how the analysis of the source data informed the constructs and specifically, how the different types of collated analysed data shed light on the original TEF constructs, and the additional constructs (e-government policies and CIO/IT systems decision

maker) introduced in our study.

Figure 2: Operationalising our Modified TEF with Empirical Data



4.1 Enacted Technology and Outcome Through Website Evaluation

The notional scores resulting from the comparative evaluation of the websites, provided us with an understanding of the type of enacted technology and the outcome in each of the respective cases. It was evident that Romeo was the least mature in terms of public electronic services available to the citizens, with a majority of services not being provided online. The one instance of level 2 services, was online processing of building application, arising from a property boom and the subsequent exponential growth in requests for building services approvals. Mike and Sierra, had the most mature range of online services, with Sierra and to a lesser extent Oscar having a large proportion of level 3 services. Mike had achieved citizen-participation by providing facilities for online citizen consultation for local decision-making, which were then taken into consideration when policies and decisions were made locally. Lima was also a leader in terms of sophistication of services, where citizens could dynamically report requests for public services through mobile devices, and then receive confirmation once that public service had been delivered.

From our findings, the transformation outcomes and the degree of DEG enacted in the technology for each of the case counties was derived:

(1) Sophisticated: Sierra, Lima and Mike are considered to be 'leaders', with evidence of transformation to DEG.

(2) Mature: Oscar, Golf, India, and Charlie are considered 'average', with some evidence of transformation but only limited DEG.

(3) Limited: Romeo was 'underdeveloped', with only rudimentary e-government and no transformation.

4.2 Codes for Objective IT, Organisational Form and Institutional Arrangements

The coding protocol used was based on a two level structure: both *etic* and *emic* (Wang & Swanson, 2007). Following this coding structure, *etic* represents the first level category established from the theory and derived from the modified TEF, whereas *emic* is the second level category derived from the specific data collected and built from the words in the texts. The first level categories, *etic*, developed from the TEF literature, identifies constituents of 'objective' technology as being hardware, software and Internet technologies before they are applied in any context (Fountain, 2005; Schellong, 2007); organisational forms and characteristics such as, bureaucracies and networks (including collaborations, hierarchies, trust and information sharing) and institutional arrangements (such as culture, socio-structure, legal norms), leading to the enacted technology.

We reviewed the data collected (interviews and documentation) for references to words and concepts associated with institutional arrangements, organisational form, outcomes and technology, to provide an *emic* level of analysis and coded the data accordingly. In order to limit errors inherent in the subjective process of classification, two researchers worked independently in the attribution process and where disagreement arose (after accounting for

errors and omissions), these were discussed until a common view was achieved. The relevant categories and associated words that emerged from the coding process, are summarised in Table 2.

Table 2: Extracts of Coding Associated with TEF Concepts

First Level Category (etic)	Organisational Form	Institutional Arrangements	Technology
Second Level Category (emic) Root words	bureaucratic / bureaucracy	*govern(ment) / board*	*privacy*
	rules / files	*political*	*data*
	hierarchy	*policy*	*social (media / networking)*
	jurisdiction	*legal/legislation*	website
	standardisation	*State*	web 2.0
	regulation	*culture*	web 3.0
	agency	*Charter*	Twitter/Facebook
	department		cloud
	committee		mobile
	control		Blogs / Discussion boards
	trust / exchange		ICT
	interoperable		*applications*
	support		*One system*

First Level 'etic' – categories derived from the literature; Second Level 'emic' – categories derived from the data

4.3 Codes for NPM and DEG in E-Government Policies

We conducted a similar coding process to generate relevant words associated with DEG and NPM concepts to determine the first level categories at the *etic* level. The *a priori* coding categories were established from the DEG and NPM literature. Fattore et al. (2012) had previously conducted a study to uncover NPM and 'public governance' (conceptually consistent with DEG) concepts in electoral discourses of Italian politicians, and we adopted a similar protocol. DEG was categorised into process (where there is a process of transformation to DEG), and actual DEG features incorporated into public policies. Where the documents mentioned important aspects of DEG, we generated keywords to label these instances and coded them according to the first level categories. Each word was used to identify the phrases and their attribution into each category was made in accordance with the contextual meaning of the document at the *emic* level. The researchers agreed on the

categories, the coding was applied to the data and the necessary revisions were made to finalise the categories to maximise mutual exclusivity and exhaustiveness. These are summarised in Table 3.

Table 3: Extracts of coding Associated with NPM and DEG

First Level Category (etic)	DEG process	DEG features	NPM policy	
Second Level Category (emic) Root words	transformation	*collaborative*	*budget*	*transparency*
	change	*share*	*costs*	*internal (efficiency/effective)*
	innovative	*participatory*	*efficient*	*private (sector)/outsourcing*
	modern	*collective*	effective	customer
	new	*consult(ative)*	non-profit	external (partners)
	R&D	*network(ed)*	profit	productivity
	simplification	*integration*	management (public)	audit
	creativity	*communication*	admin	professionalisation
	entrepreneurial	*community*	performance	competition
		open	measure	
		partner	financial	
		cooperation	service	
		coordination	*satisfaction (customer)*	

First Level 'etic' – categories derived from the literature; Second Level 'emic' – categories derived from the data

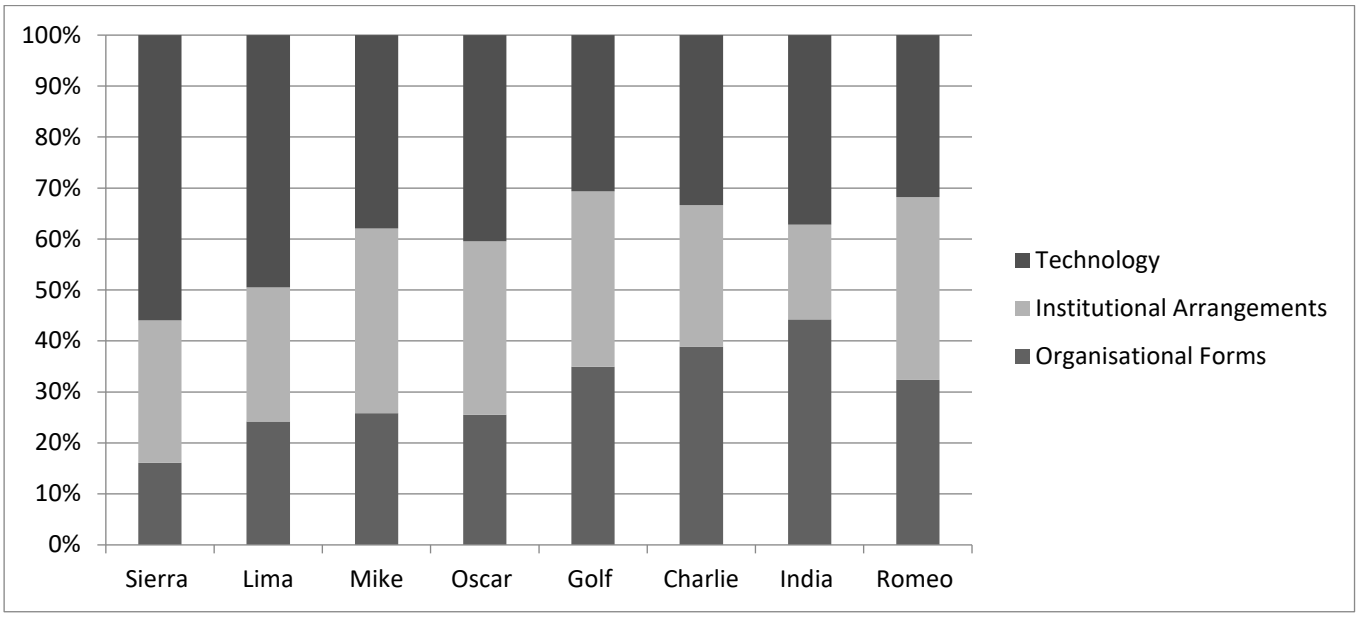
5. EVALUATION OF FINDINGS

Having established the root words, categories and coding related to (i) the TEF constructs (organisational form, institutional arrangements, objective technology) and (ii) the e-government related policy documentation (NPM and DEG), through the coding process described, the pattern of these categories across the sample counties were examined by looking at their prominence and frequency of mention (number of words over total number of words) (following Fattore et al., 2012). The essential approach for our study is interpretive, comparative and qualitative in perspective. Thus, the frequency of occurrence of specific concepts relevant to the enactment of DEG in each of the respective government organisations, provides a comparative overview of their predominance in each setting.

(i) In the first instance, Figure 3 illustrates the presence and the predominance of the

different TEF constructs emerging from the analysis of the data in the respective cases. Our findings show that technology appears as the most predominant TEF factor in the case of Sierra and Lima, with organisational forms being the least. For Mike and Oscar organisational forms appeared to be less prominent than institutional arrangements, but for India and Charlie, organisational forms were most prominent. Interestingly, both Romeo and Golf County had a relatively equal distribution of prominence in terms of institutional arrangements, organisational forms and technology. The next stage is to understand how these observed relationships impact the enactment of DEG, by linking this to the outcome data from the website analysis.

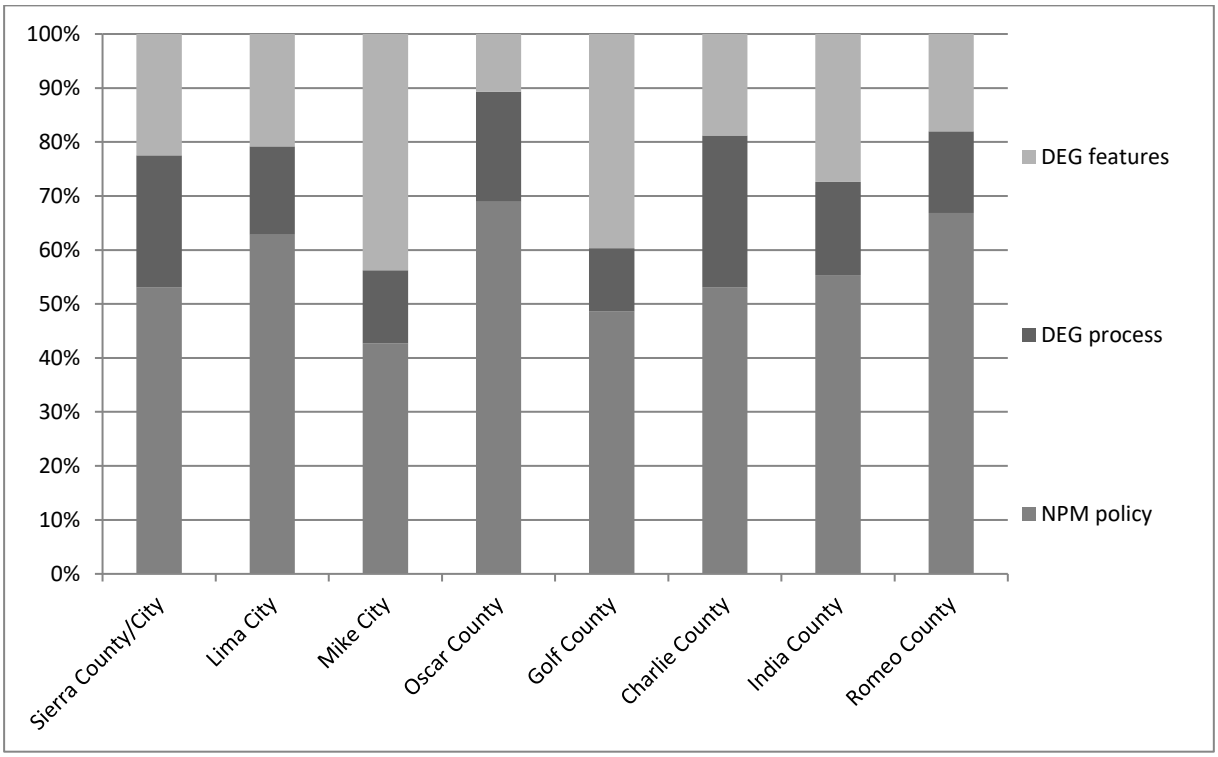
Figure 3: NPM and DEG Influence in Documentation



(ii) In the second instance, Figure 4 illustrates the predominance of the NPM and DEG ethos underpinning e-government related documentation and discourse in each of the respective cases. Our findings show that NPM is predominant in all cases except Mike. In the case of Mike, DEG appeared to be a predominant premise underpinning their policies and discourses. In the case of Oscar and Romeo, NPM was most prevalent. However, in all cases there was some evidence to suggest that DEG had begun to permeate discourse surrounding e-government; both in a phase of transition

to DEG and with some evidence of having implemented DEG. The next stage was to understand how the influence of NPM and DEG observed in each case, impacted the enactment of DEG, by linking this to our modified TEF and the outcome data from the website analysis.

Figure 4: NPM and DEG Influence in Documentation



5.1 The Role of the CIO as Institutional Entrepreneur

Having transcribed and coded the interviews of the CIOs (8) and IT decision makers (10), concepts related to the behaviour of institutional entrepreneurs began to clearly emerge. The developing narratives and themes were consistent with Leca, Battilana, and Boxenbaum (2008) field-level institutional entrepreneurship, as the 'paradox' of institutional technological determinism against the potential disruption of the emerging new digital technologies. Here, CIOs revealed how they and other IT decision makers, had to behave when their actions are determined by the institutional environment in which they work. In talking of their individual experiences, this was strongly enveloped in the process of mobilisation of resources, including development of alliances and co-operation especially professional, experts and

agents, which is core to that of an institutional entrepreneur (Leca et al., 2008; Wang & Swanson, 2007). Their failure or success of enacting DEG in the technology, appeared to be reliant on the process of cognitive legitimation through discourse or 'talking', and mobilising a coherent community within their institution, as articulated by Wang and Swanson (2007) in their study of private sector institutional entrepreneurs. Consequently, we used these categories of institutional entrepreneurship to code the data from our CIOs and IT decision makers. For instance, *mobilisation of community* was coded into sub-categories: (a) developing leadership in the organisation and community (examples of leadership and innovation/creativity); and (b) marshalling resources by persuading community members to focus attention on the new technology (innovation) (examples of support). C*ognitive legitimation* was coded into sub-categories: (a) coherent organising vision (examples of vision and strategy); and (b) definitive success stories from users and vendors (examples of understanding, engaging and learning). Tables 4-6 present examples of comments made by the respondents and how they were coded. The organisation of the coded information in each of the tables, are in accordance with the outcomes of DEG enactments made earlier i.e. 1) sophisticated, 2) mature, and 3) limited.

Table 4: Sophisticated DEG (categorisation of community mobilisation and cognitive legitimisation by the CIO)

Mobilisation of community		***Examples of CIO Quotations***
Developing leadership in the organisation and community	Leadership	*When it comes to government however, we have an amazing leader … because he understands the transformative power of technology and is unafraid to try things*[1] *I am a change agent and want to make things better and more rational*[1].
	Innovative / creative	*I am never going to win the political battle, ever, so I have to change the rules of the game*[1]. *All I am doing is throwing that bowl of spaghetti on the wall over and over and over again and watching whatever sticks – regardless of whether it is actually going to be what I want or will have the most impact … I have to find a third and alternative way to give them something exciting and will make them look good and by the way help me, underneath the radar we build the technology … and slowly but surely I can get everybody into the funnel*[1] *I don't even know if a lot of folks ever realise that by the way there is a community out there*[3] *So we couldn't proportionately grow the city and our services at the same rate as the citizens were coming in … so we had to get innovative in how we were going to deliver*[3]
Marshalling resources by persuading community members to focus attention on innovation	Support	*We have a great deal of support from city council and the support trickles down from there to the city manager's office*[4] *The citizen as part of the process and actually in some cases part of our solution. As well as our own internal users, we call them citizens and we have turned everything back to them.*[3] *We had the city manager … our vision was the same and I understood where he wanted to go and had already done that before in the private sector, so I had a lot of support*[3]
Cognitive Legitimation		***Examples of CIO Quotations***
Coherent organising vision	Vision	*He matches the culture of the city and pushes all of us – he doesn't care if we fail, obviously within reason, but he keeps pushing us.*[1] *There has been a continuum of leadership and there is vision and planning long term. Another part of this is that I have been with the city … for 31 years so there has been a continuum [where] I have had an opportunity to build the short term view and build a much longer term view too and I have had the opportunity to be here and had the patience and fortitude with which to finish those projects which were envisioned years ago. I think that's really what makes a lot of the difference.*[4]
	Strategy	*The worst thing we can do is just keep doing things the same way. Keeping things the same is not an option for this city*[1]. *I need to get … an executive order that calls for consolidation of services and operations and standardisation … so that our citizens as well as co-workers as well as tourists or anyone else coming in has a uniform common way of dealing with the city … That was the goal and I developed a 5 year plan to do that.* [1]
Definitive success stories from users and vendors	Understand Engage Learn	*I don't have any good data to say whether I am having an impact, all that I know is that I am doing stuff and people are looking to our city as a leader and I don't know exactly what that means other than we are doing a lot of different things and talking about it and becoming a sort of thought leader if anything*[1] *I am an Oracle showcase … So I am measuring everything we do … once we had proven ourselves, they were very happy to throw everything back over the wall*[3]

Note: 1 Sierra; 3 Lima; 4 Mike

Table 5: Mature DEG (categorisation of community mobilisation and cognitive legitimisation by the CIO)

Mobilisation of community		***Examples of CIO Quotations***
Developing leadership in the organisation and community	Leadership	*The CEO understands [technology] … partnering with some consulting professors … at the University centre for leadership and transformation… to help start putting rapid transformation methodology in place here*[2]*.* *In the past the more successful projects have been the ones that have been driven by the business. If you don't have that and it doesn't come from that side, then it is like what I call pushing a string*[2]*.*
Marshalling resources by persuading community members to focus attention on innovation	Support	*We convinced the CEO and the CFO that ... and then we went out and talked to all the agencies … they got up in arms and went and told the CEO we don't want this and so there was a backlash ... they said nobody else can do it, … and that is where it died basically.*[5] *I am trying to move the sponsorship … from the CIO to the business and involving the assistant CEO and other agency directors is the way we are trying to achieve that they really need to own it.*[5]
	Frustration	*In government you live with a lot of pain but you just put up with it – there is no one going to change anything. So this gave them hope that they had a voice.*[2] *I don't have the authority to ensure that the solutions they go off and find are approved in some way and that is a frustration. In the past leadership has focused on the wider remit for telephony and data centres and that's it and then there has been a lack of leadership here for IT for the last 5-6 years.*[5]
Cognitive Legitimation		***Examples of CIO Quotations***
Coherent organising vision	Vision	*When we first introduced the e-gov term many of us felt we have to change how we do business inside and then it will be easier to work with the public – but people just didn't hear it.*[2] *The CIO's role is really to try and make some sense of the chaos that exists, it really is an anarchy to be frank about it … a good number participated in creating the vision, and strategic plan … but we have not been able to progress beyond that because of reasons of control and lack of funding – so my role is to create the vision then cajole people to move in that direction.*[5] *I have accomplished at least a shared vision but I don't have the authority to influence decisions beyond that. We are working on it, there has been a management audit and this has suggested that the CIO would have a much broader authority, but it remains to be seen.*[7]
Definitive success stories from users and vendors	Understand Engage Learn	*A good study is the province of Ontario where they went away from multiple municipal government to a metro government [mandated by federal government] It will never happen here in California.*[5] *The biggest stumbling block is the amount of effort by key people having to work towards educating business people.*[2]

Note: 2 Charlie Country; 5 Golf County; 7 Oscar County

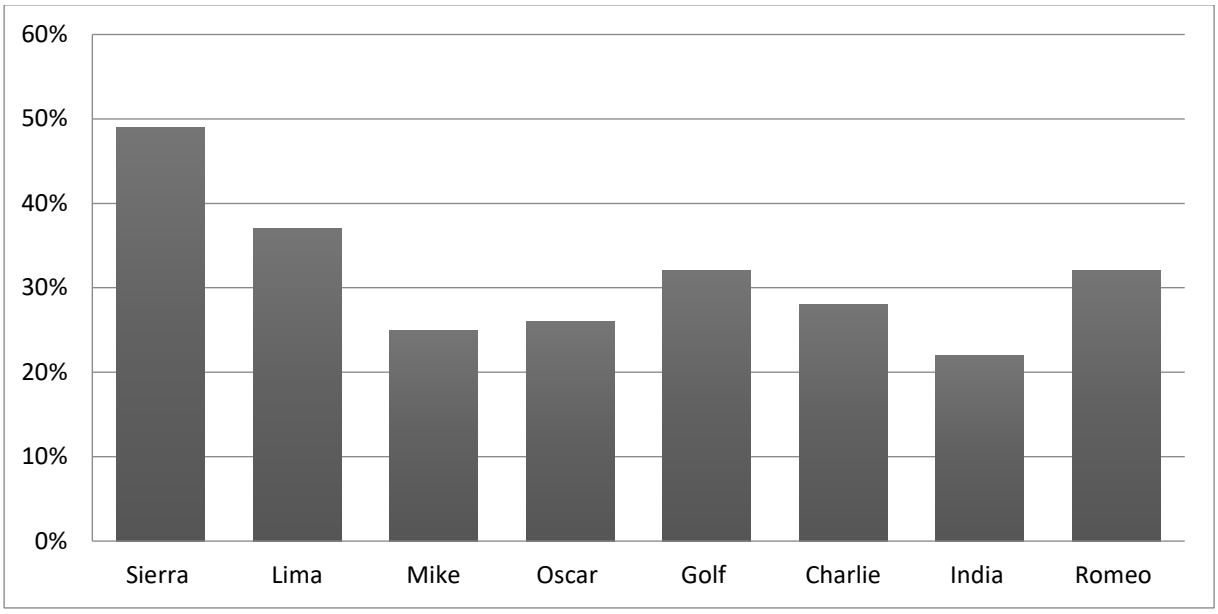
Table 6: Limited DEG (categorisation of community mobilisation and cognitive legitimation by the CIO)

Mobilisation of community		***Examples of CIO Quotations***
Developing leadership in the organisation and community	Leadership	*It is very frustrating it is like a vicious cycle. How do you break the cycle? Well I think in better financial times we would have done it and already broken the cycle.*[6] *Show me it works and I will follow you to the end of the earth' is the kind of attitude they have but they are not quick to appropriate money to a concept. They believe in seeing concrete evidence – if you deliver it to them in the right form they can be pretty supportive. Now they don't have anything to be supportive with.*[6]
Marshalling resources by persuading community members to focus attention on innovation	Support	*If you deliver it to them in the right form they can be pretty supportive. Now they don't have anything to be supportive with.*[6] *We had a very strong e-government project to put in a full blown portal with a lot of ideas for apps to deliver services and I could not get funding. I mean for the last four years I haven't been able to incur a dollar towards e-government.*
Cognitive Legitimation		***Examples of CIO Quotations***
Coherent organising vision	Vision	*There is so much we can do, there is so much. I don't believe e-government is a luxury, I know at least 3 of the 5 board members were very much would like to provide more services over here, but they are at the point where they see an employee in front of them in tears and in my mind they are making the right choice*[6]
	Strategy	*It had been our original plan … that involved all of our department heads and interested parties … to help us design a portal with the idea that if we delivered a service at the counter then we ought to deliver it electronically for those that chose to use it. That's unfortunate that we have not been able to realise that.*[6]
Definitive success stories from users and vendors	Understand Engage Learn	*When it comes to e-government it's somewhat of an unproven concept to them. They really aren't sure [it will be used] because we haven't had the major success where I can go and say "wow, I saved $200K costs annually offset by this $100K project. There haven't been those kinds of things that would firmly implant them to invest in the future.*[6]

Note: 6 Romeo County

In order to establish the degree of institutional entrepreneurship behaviour demonstrated by each of the respective CIOs, we followed a similar method in terms of collating the frequency of coded concepts related to institutional entrepreneurship activity by each respective CIO. The number of times examples of community mobilisation and legitimisation were mentioned by the respondents, were aggregated and charted in Figure 5. Again, this representation is intended to be interpretative, comparative and notional, based on the data analysis from the interviews.

Figure 5: Comparative CIO Degree of Institutional Entrepreneurship



All the CIOs demonstrated skills and understanding of the need to mobilise communities through leadership, focusing on members' interests, and legitimation through coherent organisational vision and success stories, to navigate through the public sector institutional arrangements and organisational forms. It is difficult to independently establish the degree of legitimation and standing of the respective CIOs within their communities without conducting extensive interviews within their networks and organisations. Thus, in addition to face-to-face interviews, where we noted which CIOs had been mentioned by their peers as being 'entrepreneurial' or 'innovative', we did a search of the web to get a sense of the degree of legitimation by the number of references made to the CIOs – through speeches, publications, articles etc. These were noted as Google search hits in Table 6. Similarly, to establish a notion of their standing within their respective communities, and obtain an impression of the size of their professional networks, we examined the number of Linked-in connections for each of the CIOs. Linked-in is increasingly being recognised as a means of revealing the structural property of professional relationships, where the denser and larger the number of relationships, the more likely the user is to be an influencer within the network (Kietzmann, Hermkens, McCarthy, & Silvestre, 2011). This is particularly important in our case of CIOs

as institutional entrepreneurs, since the 'successful outcome' of mobilisation and legitimation, is closely linked to the ability to influence their community (both inside and outside their organisations). A summary of these is presented in Table 7 and largely mirror the tendency to institutional entrepreneurship behaviour of the respective CIOs identified in their interviews.

Table 7: *External Standing of CIOs*

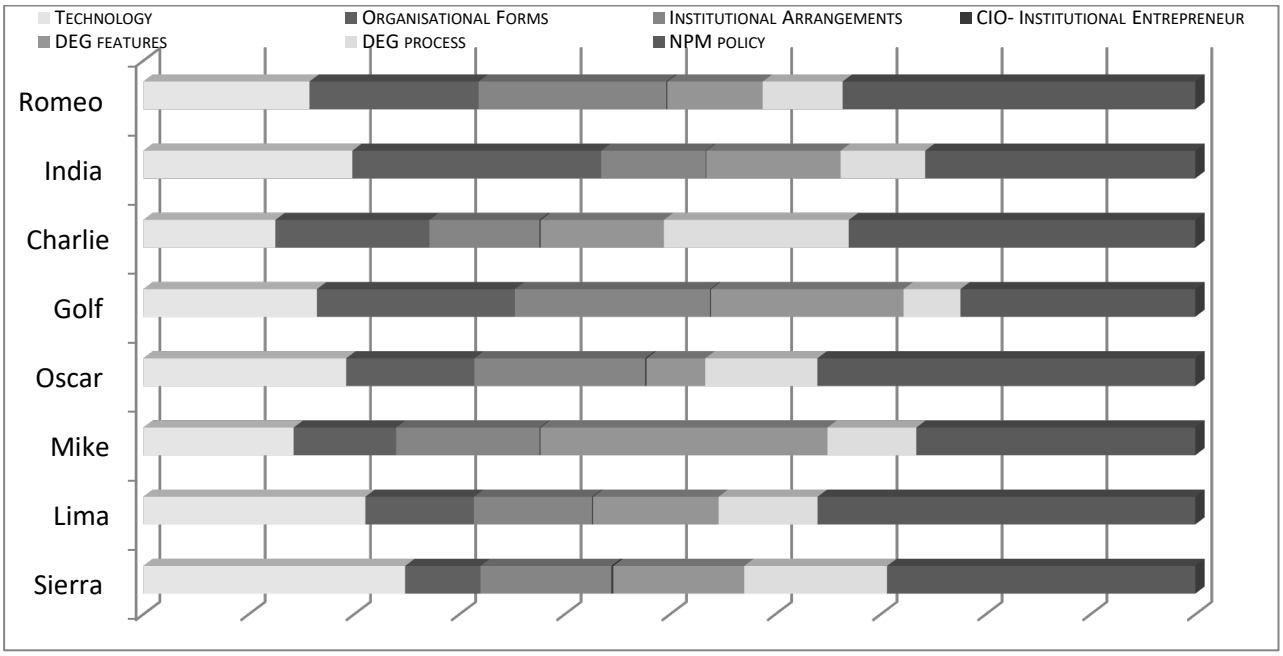
January 2011	*Sierra*	*Lima*	*India*	*Mike*	*Oscar*	*Charlie*	*Romeo*	*Golf*
LinkedIn Connections	*500+*	*210*	*156*	*98*	*0*	*0*	*31*	*177*
Google Search (hits)	*8.3 million*	*1.55 million*	*269 thousand*	*212 thousand*	*49 thousand*	*407 thousand*	*8,060*	*3,110*
Mentions by interviewed peers	*7*	*2*	*0*	*1*	*1*	*1*	*0*	*1*

Overall, the CIOs of Sierra and Lima showed strong signs of institutional entrepreneurship. In particular, the mobilisation of community where they were very close to the powers that allocate budgets and other resources. They were highly engaged in the process of ensuring the community understands the issues related to DEG and the potential it can deliver. All CIOs were aware of the importance of legitimation through coherence of vision and success stories (see quotations in tables 4-6). Where DEG enactment was 'limited', the CIO had been unable to provide internal DEG related success stories. For example, the Romeo CIO explained how the budget holders "believe in seeing concrete evidence – if you deliver it to them in the right form they can be pretty supportive. Now they don't have anything to be supportive with … we haven't had any major success".

6. DISCUSSION

Having established the relative influence of the components of the core TEF in each of our cases (technology, organisational forms, and institutional arrangements), we also compiled the results of the modified TEF: namely CIO/Institutional Entrepreneur and E-government Policy (DEG features, DEG process and NPM policy) for each case. Figure 6 presents all the results from the constituent parts of our modified TEF in one chart, for ease of comparison and interpretation. Figure 6, presents a conceptual overview of the predominance of different elements in the process of enacting DEG in the selected public organisations. The public organisations are grouped according to their outcomes: Sierra, Lima and Mike are relatively sophisticated in terms of their transformation to DEG. The cases of Oscar, Golf, India and Charlie are relatively similar, and can be seen as typical of Norris's (2010) characterisation of e-government implementation; offering few information and transactional services with no integration, and thus only limited transformation to DEG. Romeo County is considered to have only limited e-government and no transformation to DEG.

Figure 6: Components of the DEG Enactment Framework: Comparing the Cases



In the three cases where some transformation to DEG was observed, organisational forms

appeared to be less apparent in the overall process, a finding consistent with that of Zhao, Shen, and Collier (2014). While theoretically organisational forms are the most important influences on technology enactment (Cordella & Iannacci, 2010), our findings suggest that where they are more predominant, they act as a hindrance to the transformation to DEG, confirming the crucial role they play in the process. In comparison, institutional arrangements on the whole seemed to play a consistent role across all the sampled cases. Where these arrangements were comparatively more obvious (Golf and Romeo), qualitative evidence suggested that they were experiencing much resistance to change. The culture was largely anti-DEG and the organisational design (or lack of) was reinforcing existing structures of entrenched power and control (Chadwick, 2006; Fountain, 2001) and consequently limited DEG transformation.

E-Government Policies: NPM and DEG

Our findings advocate that the influence of NPM on e-government policy is considerable and deeply embedded, as pessimistically characterised by Norris (2010). Our cases highlighted the fact that, even in the context where general opinions and the wider environment might be shifting to one that is more digital and networked, the characteristics of the enacted systems were difficult to change. The entrenched organisational forms and institutional arrangements made it even more complicated, because they were also enacted upon these technologies, making them more resistant to change (Cordella & Iannacci, 2010; Fountain, 2001). For instance, in the case of Romeo that had no evidence of transition to DEG, we noticed a predominant underpinning of NPM in their e-government policies and discourses.

We therefore posit that current enacted systems are a remnant of 'old' reforms, and NPM remains the foundation of the E-government agenda directly influencing the enactment of digital technologies. We also confirm that, specifically within the explored cases, the progress of the wave towards DEG is essentially articulated in the language of public institutional

documentation (Dunleavy et al., 2006; Margetts & Dunleavy, 2013). Thus, we can see that in the context of local government in the US, technology is a carrier of e-government aims articulated in e-government policies and that the design and implementation of the enacted technology may have a long term impact that outlives the aims that initially reformed them.

Actors: CIO as Institutional Entrepreneur

To account for institutional change and transformation, most studies focus on institutional entrepreneurship (Wijen & Ansari, 2007). Maguire, Hardy, and Lawrence (2004) identify field-level institutional entrepreneurship, that relates to how individuals behave if their beliefs and actions are determined by the institutional environment they inherit. Individual conditions relate to the process of institutional entrepreneurship involving the mobilisation of resources, including development of alliances and co-operation (Maguire et al., 2004; Tracey, Phillips, & Jarvis, 2011). The failure or success of diffusion and implementation of a new technological innovation, is reliant on the process of legitimation through discourse and mobilising within a recognised coherent community (Wang & Swanson, 2007). Thus, by introducing institutional entrepreneurship to the original TEF, this re-introduces agency to institutional theory and, in our context, shifts the research focus on the specific role. It provides a complementary lens through which to further examine the challenges faced by an institutional entrepreneur (in our case the CIO), in attempting to create and mobilise people behind a vision leading to action that is unfamiliar to the institution (Battilana, Leca, & Boxenbaum, 2009). Furthermore, our findings confirm what scholars and practitioners see as a developing and strengthening link between technology and entrepreneurship (Del Giudice & Straub, 2011), and an ever closer relationship between the priorities of CIOs and entrepreneurs (Davidson, White, & Taylor, 2012). Fountain explains how, in 2000 the growing list of federal interagency websites were established by “agency entrepreneurs” (Fountain, 2001, p. 162), and hinted at this link from the outset.

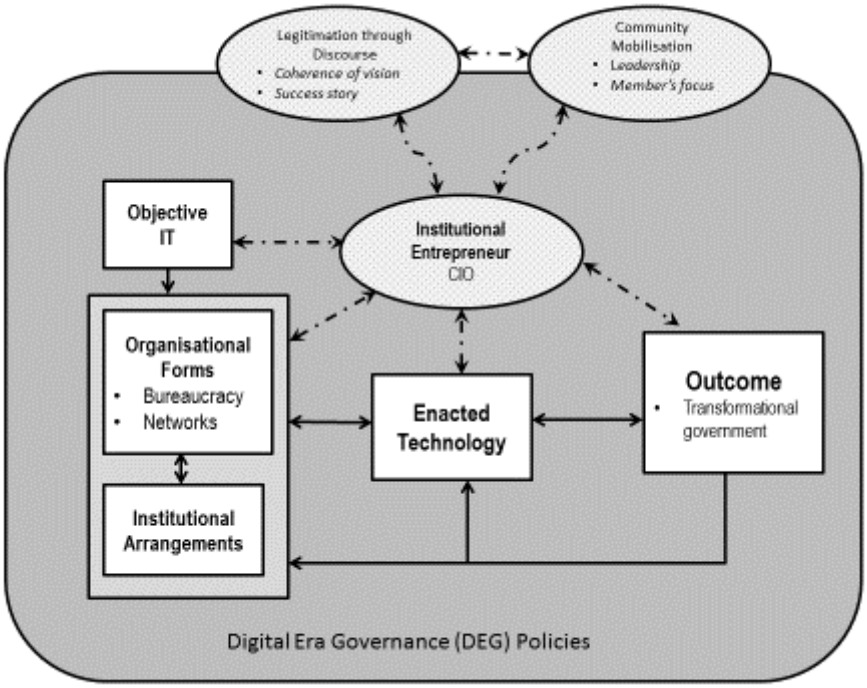
Our findings showed that overall, all the CIOs demonstrated institutional entrepreneurship behaviour by articulating the need to mobilise communities and legitimate DEG through discourse, albeit with varying degrees of 'successful' DEG enacted outcomes. Our study interestingly, confirmed the private sector model of institutional entrepreneurship (Wang & Swanson, 2007) for the public sector. Of those that had enacted DEG, they had been able to a marshal support, develop and mobilise allies, and focus the attention of a myriad of stakeholders, while at the same time developing a coherent vision and broadcasting success stories throughout their respective counties and beyond. In fact, the respondents we interviewed, corroborated our findings of the institutional entrepreneurs by naming the CIOs of Sierra and Lima as “leaders”, thus underlining their legitimacy outside their organisational boundaries. Where the enactment of DEG had failed (Romeo county), institutional arrangements and organisational forms had played a large part in acting as barriers and disabling opportunities for community mobilisation and opportunities for discourse and communication.

Furthermore, it is clearly a significant feature of entrepreneurial activity to be involved with aspects of engaging in individual and organisational risk. This is of course highly prominent in both private and public sector environments. The question relates to the extent an institution is prepared to accommodate the resultant uncertainty associated with possible ‘cavalier’ attitudes of senior managers, who would normally be expected to comply with standard behaviour in their decision making. There is evidence from practice, which emerged through our interview data, that institutional entrepreneurs are capable of sustained and energetic attention to normally mundane procedural issues. The related literature also identifies with these individuals and how innovation, in particular, may be fostered within a government organisation. Essentially, ‘It is about pushing the frontier of what we know in the hope of generating new ideas and then putting them into practice’ (Stern, Green, Boyd, & Finighan, 2014). Importantly, in this context, risk of failure is most notable within intrinsic

technological innovation challenges. The most entrepreneurial of CIOs (Sierra) was prepared to take the risks, and he described his approach as "throw[ing] a bowl of spaghetti on the wall" to see what sticks, with no real fear of failure, an attitude which was encouraged by the organisational forms and institutional arrangements of his organisation.

It is therefore our contention that the human actors identified as CIOs in the TEF (Fountain, 2001; Schellong, 2007) act as institutional entrepreneurs who navigate the lack of autonomy and bureaucratic environment in the process of enacting DEG within technology. We also posit that not all actors are equally adept at producing desired outcomes and not all actors are located in dominant positions that they can compel other actors to change their practice (Maguire et al., 2004). Figure 7 illustrates the central role of the CIO in the process of enacting DEG.

Figure 7: The CIO as Institutional Entrepreneur and DEG Enactment Framework



Policy Implications

In the public sector, concerns about equity, accountability, careful management of funds and limited resources make any bold, innovative, risk-taking behaviour seem suspect (Bernier &

Hafsi, 2007). However, advances in technology, emergence of big data, environmental turbulence and fiscal difficulties mean that the public sector is under pressure to deliver on citizen demands for more and complex public services with fewer resources. As a consequence, there is a need for the public sector to be more creative, innovative and less risk averse in order to adapt to our rapidly changing world (Musgrave, 2014). There have been examples from the US and Canada where 'proactive, innovative behaviour and bold risk taking' by institutional entrepreneurs in the public sector, has led to successful and innovative projects when conditions were favourable (Bernier & Hafsi, 2007). An example of favourable conditions where an individual entrepreneur dominates, might be when there is strong government with concentrated and powerful stakeholders and where new products and services are badly needed. As conditions change then a 'systemic entrepreneurship' might be necessary (Bernier & Hafsi, 2007). Indeed, some scholars suggest that entrepreneurship within the public sector produces superior organisational performance (Kearney, Hisrich, & Roche, 2009; Musgrave, 2014).

It is evident from our research that the benefits of securing and encouraging the role of institutional entrepreneurs are significant. The issue is the personality of the senior managers involved given their professional experience of working within ostensibly public sector environments with traditional constraints and structures. It is argued however, that the opportunities through DEG now negate such concerns and technology offers far more scope for applied organisational transformational. In this respect, Wirtz and Daiser (2016) call for, '……. a new e-Skills profile for public administration…'. This is embedded in DEG and relates to the foundations of senior managerial roles where citizen orientation, transaction interactivity, transparency and dialogue through an holistic electronic government delivery model are successfully achieved. Policy makers and public administrations need to be aware that in order for a transformational change to be realized and DEG to achieve its potential, there is a need to have institutional entrepreneurs in all positions and departments of the

complex organisation and not just the CIO acting within a dual-role and uncovering 'systemic entrepreneurship' (Bernier & Hafsi, 2007) to enact DEG in government is an area for future research.

From the literature, there appears to be a consistent articulation of doubt relating to changing developments in public sector organisations. These mirror Norris' (2010) pessimism about transformational DEG, with warnings that achieving fundamental change is extremely complex and there must be caution against the over-optimistic hopes for public sector reform. As Cordella and Iannacci (2010, p. 63) note, 'The outcomes of eGovernment policies are therefore a combination of political, social, and technological components that shape in a recursive interaction their outcome'. Addressing the criticism that research has tended to expect transformation of governance through technological determinism, we have illustrated some influences and factors that enact upon the context associated with DEG developments, in our digital enactment framework.

7. FURTHER RESEARCH

Our study, is qualitative and interpretive in nature, based on 8 cases of local county government in the US states of California and Nevada. Thus, while the research may not be considered generalizable or representative of the whole institutional governance sampled, we provide an in-depth view of the complex interactions between actors (CIO and IT decision-makers), e-government policies and the entities involved in the enactment of DEG technology. From our findings it is perhaps difficult to predict whether, and the extent to which, CIOs acting as institutional entrepreneurs may influence transformation to DEG over time and, therefore, a longitudinal study would be useful to track further trends and changes. The research was conducted during a severe economic crisis with noted limited public budgets. Rather than being a negative, this austere environment is seen as potentially fertile ground for transformational change (Tracey et al., 2011). Future research could build on our

adapted theoretical evaluation and formulate sound metrics to determine the impact of different constituents of TEF. The role of other institutional entrepreneurs within public organisations can be further investigated to consider similarities of culture and processes and their impact on transformation government, usefully within different countries.

8. CONCLUSION

Drawing on the findings from case organizations there is evidence of DEG's influence beginning to diffuse into the public institutional language. We enhance Fountain's (2001) TEF in the context of DEG and posit that institutional entrepreneurs play a central role in the enactment of technology. In its current state, E-government is a product of NPM policies and the drive for efficiency, effectiveness, cost savings and citizen centricity. We contribute to extant body of knowledge by emphasizing the importance of an analysis of the process of enactment when determining the greatest impact on the development and exploitation of DEG. Consequently, public sector managers, driven by citizen demand and advances in DEG, should be motivated to consider institutional entrepreneurship more comprehensively to achieve successful transformational change.

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Appendix

Types of online services categorised as Levels:

(1) information only, static information about a public service is available online. Dispersed services over different websites

(2) one way interaction from the government to the citizen where forms are available to download but process offline (for instance registration forms)

(3) 2 way interaction where users can submit and receive a service based on a fixed pre-set process (for instance payment of bills online, submitting planning applications). Co-ordinated services accessible through a single portal but not integrated.

(4) dynamic citizen led transactions where citizens request and receiving the public. services on demand (for instance using a mobile device to request a service immediately such as reporting a pothole or graffiti, where the citizen takes a photograph which is GPS tagged and uploaded via the device to the service provider. This raises an incident which the public service provider who then responds and this progress is reported and tracked online. Seamless integration of systems to solve a life event.

(5) citizen consultation and involvement in the democratic process of governance (for instance citizen consultation on policy changes)