AN ACTOR-NETWORK THEORY (ANT) APPROACH TO TURKISH E-GOVERNMENT GATEWAY INITIATIVE

Dr. D. Selcen O. Aykac
Ozyegin University/Post-Doc Research Fellow
Kusbakisi Cd. No: 2 Uskudar, Istanbul TURKEY
selcen.aykac@ozyegin.edu.tr

Dr. Ronan de Kervenoael
Sabanci University/Ass. Prof.
Orhanli, Tuzla Istanbul TURKEY
dekervenoael@sabanciuniv.edu

Dr. Nihat Kasap
Sabanci University/Ass. Prof.
Orhanli, Tuzla Istanbul TURKEY
nihatk@sabanciuniv.edu

Dr. Enes Eryarsoy
Sabanci University/Ass. Prof.
Orhanli, Tuzla Istanbul TURKEY
enes@sabanciuniv.edu

—Abstract —

There are various models proposed in the literature to analyze trajectories of e-Government projects in terms of success and failure. Yet, only the Actor-Network Theory (ANT) perspective (Heeks and Stanforth, 2007) considers the interaction factors among network actors and actants. This paper proposes the ANT for approaching to the Turkish e-Government Gateway initiative as a case study. In doing so, it provides valuable insight in terms of both local and global actor-networks which surround the initiative.

Key Words: *e-Government, Turkey, Actor-Network Theory*
JEL Classification: O33

1. INTRODUCTION

It is estimated that Western European Government and United States will invest some $49 billion[1] and $6 billion[2] in IT in year 2009, respectively. According to Worldbank, "*e-government, refers to the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government"*[3]. It is noted that e-government initiatives are expected to result in better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, and more efficient government management. In addition, other expected side benefits involve less corruption, increased transparency, greater convenience, revenue growth, and cost reductions. Despite all the goodwill and large investment budgets, Akman et al. (2005) stress that "*the key to making e-government work is not technology but the citizens"*. This paper aims to uncover the trajectories of the Turkish e-Government Gateway initiative.

When going about conducting a project – i.e., undertaking an e-government initiative – there are a lot of factors that influence how it is done and how its outcome is influenced by. For instance, for the case of e-government gateway, prior similar experiences, IT regulations and capabilities and so forth are some key influencers. All of these factors are related or connected to how parties involved in the project act. Like any other IT project, e-government gateway cannot be developed in a total vacuum but rather under the influence of a wide range of surrounding factors. The acts parties have carried out, and all of these influencing factors, should be considered together. This is exactly what the term actor-network theory accomplishes. An actor network is "*the act linked together with all of its influencing factors in building a network*" (Suchman, 1987; Hanseth and Monteiro, 1998).

The theoretical framework for e-government gateway analysis must be sufficiently rich to comprehend the complexities of all network actors' interactions. The Actor-(or actant) Network Theory (ANT) of Latour and Callon (Callon, 1986; Latour, 1988; Latour, 1992; Latour, 1993) offers a set of analytical resources for this purpose (Frohmann, 1995). ANT has been previously employed by Heeks and Stanforth (2007) to explain the trajectories of the Integrated Financial Management Information System (IFMIS) development – an application of IT in the Sri Lankan Government. In this paper, we also draw on the ANT for analyzing the Turkish e-Government Gateway initiative as a case study.

[1] http://www.zdnet.co.uk/tsearch/western+european+spending.htm
[2] http://www.eu-forum.org/article.php3?id_article=126&debut_article=485
[3] http://go.worldbank.org/M1JHE0Z280

The remainder of this paper is organized as follows: The following section introduces Actor-Network Theory through a review of associated literature. Next section explains case overview and history of Turkish e-Government Gateway initiative. The conclusions constitute the last section of the paper.

2. ACTOR NETWORK THEORY

2.1. Background

Knowledge and artifacts are often described either by society or by nature. To transcend the inherited dualism, another dimension is demanded. This is the process of society/nature construction, which leads to the stabilization of a strong network (Latour, 1992). Actor-Network Theory (ANT) tackles the challenge of uncovering "*reality as transitional in its becoming, and as trajectories of creation*" (Miettinen, 1997).

The field of social studies of technology in general, and ANT in particular, has been evolving rapidly. ANT is a critical social theory that is lead by Callon (1986), Latour (1987), and Law (1987). ANT has originated from the field of science and technology research. Specifically, it is employed in the conceptualization of social interactions in networks, where both the material and the semiotic environments are integrated. Semiotics is the "*study of signs and symbols, both visual and linguistic, and their function in communication"*(WE, 2005). Since ANT accounts for the semiotic environment, it is considered a type of grounded theory. Moreover, ANT is also related with situational theory, symbolic interactionism, socio-technical systems theory, institutional theory and network theory (Garson, 2008). Through the lens of social phenomena of information science, sociology and political science, ANT explains how a technological innovation diffuses.

ANT explains the gradual formation of a network. Human and non-human actors' characteristics, which are included in the network, are defined by their representative actants' continuous interactions (Lanfrey, 2006). During these interactions, common definitions and meanings are constructed, and representatives are re-defined. Actors co-opt to each other in order to achieve both individual and collective goals. Though only actors are capable of assigning actants that can

circulate within the system, both actors and actants are responsible for the formation of the network as it proceeds towards a stabilized system (House, 2001).

ANT does not make a distinction between subjects and objects, the subjective and the objective. Accordingly, an actant might be human or non-human. There are beings other than humans with agency, to act and matter (Risan, 1997). More important than symmetrical treatment of humans and non-humans is their relational definition as arguments and functors within the network (Lemke, 2001). Latours and Callons valuable conceptualizations involves "*regimes of delegation; the centrality of mediation; and the position that nature and society are not causes but consequences of human scientific and technical work*" (Bowker, 2002). Moreover, "*ANT is based on no stable theory of the actor; in other words, it assumes the radical indeterminacy of the actor, i.e., neither the actor's size nor its psychological make-up nor the motivations behind its actions are predetermined (Callon and Law, 1997)*". Next two sections introduce these central concepts and global / local network perspective.

2.2. Central concepts

ANT's vast potential for explaining the complex social interactions associated with Information Technologies has been recognized by previous research (Walsham, 1997; Hanseth, Aanestad et al., 2004). ANT approach has been widely accepted to interpret surrounding process of technology implementation projects (Hanseth and Monteiro, 1997; Walsham and Sahay, 1999; Mitev, 2000). In this paper, we also propose an ANT approach to uncover the social processes associated with a technology implementation initiative, namely the Turkish e-Government Gateway Initiative. Correspondingly, Table 1 summarizes the some central concepts of ANT.

Table 1. Working Definitions of Some of the Central Concepts of ANT

Concept	**Definition**
Actor	Any element which bends space around itself, makes other elements dependent upon itself and translate their will into the language of its own. Common examples of actors include humans, collectivities of humans, texts, graphical representations, and technical artifacts. Actors, all of which have interests, try to convince other actors so as to create an alignment of the other actors' interests with their own interests. When this persuasive process becomes effective, it results in the creation of an actor-network (Callon and Laiuur, 1981, p.286) .

Actor Network	Heterogeneous network of aligned interests, including people, organizations and standards (Walsham and Sahay, 1999, p.42).
Punctualization	Treating a heterogeneous network as an individual actor to reduce network complexity (Law, 2003).
Translation	The process of the alignment of the interests of a diverse set of actors with the interests of the focal actor. The creation of an actor-network. This process consists of three major stages: problematization, interessement, and enrolment. Numerous actors within an organization may be involved in a different process of translation, each with its own unique characteristics and outcomes. For purposes of clarity, it is useful to focus on a single actor, from whose vantage point we wish to see the process of translation (Callon, 1986; Walsham, 1997).
Problematization	The first moment of translation during which a focal actor defines identities and interests of other actors that are consistent with its own interests, and establishes itself as an obligatory passage point (OPP), thus 'rendering itself indispensable' (Callon, 1986).
OPP	The obligatory passage point, broadly referring to a situation that has to occur in order for all the actors to satisfy the interests that have been attributed to them by the focal actor. The focal actor defines the OPP through which the other actors must pass through and by which the focal actor becomes indispensable (Callon, 1986).
Interessement	The second moment of translation wich involves a process of convincing other actors to accept definition of the focal actor (Callon, 1986).
Enrollment	The third moment of translation, wherein other actors in the network accept (or get aligned to) interests defined for them by the focal actor (Callon, 1986)
Inscription	A process of creation of artifacts that would ensure the protection of certain interests (Latour, 1992).
Speaker/delegate/ Representative	An actor that speaks on behalf of (or stands in for) other actors (Callon, 1986; Walsham and Sahay, 1999).
Betrayal	A situation where actors do not abide by the agreements arising from the enrollment of their representatives (Callon, 1986).
Irreversibility	Degree to which it is subsequently impossible to go back to a point where alternative possibilities exist (Walsham and Sahay, 1999, p.42).

Source: (Sarker, Sarker et al., 2006, p.6)

2.3. Local/global networks

There are two different forms of network that determine the result of an IT project (Law and Callon, 1992). *Global* network involves the set of relations "*that is built up, deliberately or otherwise, and that generates a space, a period of time, and a set of resources in which innovation takes place*" (Law and Callon, 1992, p.21).

Outside resources that enable the project, such as budget, previous similar experiences, regulations, are all parts of the global network. *Local* network, on the other hand, involves the set of relations "*necessary to the successful production of any working device*" (Law and Callon, 1992, p.22). Inside resources, such as established relations amongst the implementer actors of the project are considered in terms of the local network. Within this notion, items that pass between local and global networks are referred as the *intermediaries*. Usually a project office controls the flow items between the two networks. This controlling institution is named as the *obligatory point of passage (OPP)*.

The trajectory of an IT project is dependent on three interrelated functions (Law and Callon, 1992, p.46). They determine whether the project will be successful or not. These are:

1. Global Network – the presence of a global network ready to provide various resources.
2. Local Network – the capability of forming a local network that can utilize resources that the global network gives in return for the expectations of the actors of global network.
3. OPP – the ability to build and maintain an obligatory point of passage.

The altering conditions within the project can be plotted on a two-dimensional graph (Figure 1).

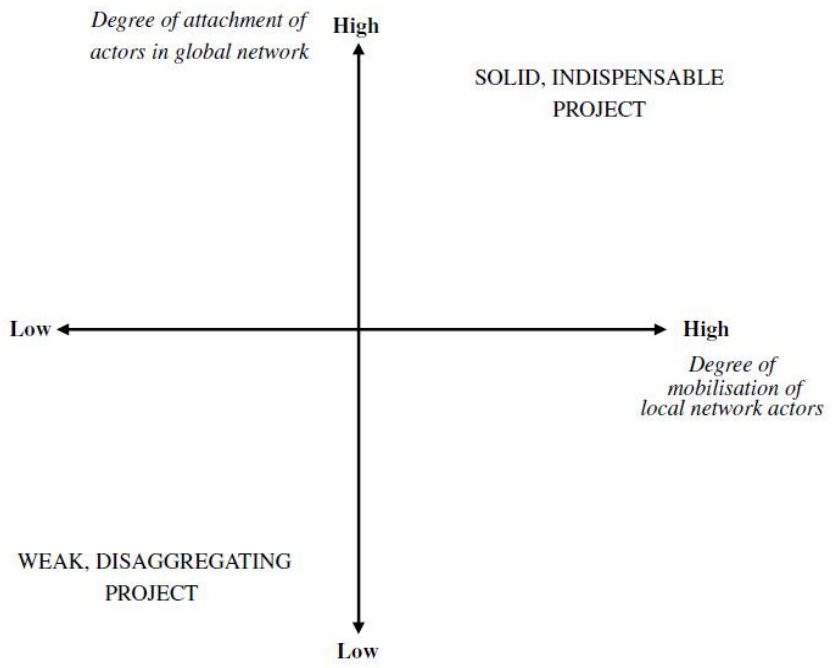

Figure 1. Mobilization of local and global networks (Law and Callon, 1992)

3. CASE OVERVIEW & HISTORY

E-Government initiatives have been launched in Turkey in year 1998 through the VEDOP and MERNIS projects. This has been followed by Urgent Action Plan for e-Transformation Turkey Project (e-DTR) in year 2002. In 2003, Information Society Department has been established within the State Planning Office to assume the policy and coordination responsibilities of e-DTR. The very same year, Short Term Action Plan has been launched. In 2004, Ministry of Finance launched e-bildirge, and collection of tax statements via the Internet. Following year, in 2005, e-Transformation 2005 Action Plan has been prepared. Peppers and Rogers Group has been sub-contracted to prepare National Information Strategy of Turkey. Before the end of 2005, Oytek Technologies together with their Singapore-based partner CrimsonLogic [4] signs contract for the development of Turkey's first eGovernment portal with Turkish Telecom (TUBIDER, 2005). E-Government

[4] http://www2.egov.gov.sg/online_newsletter/issue18/Turkish%20eGovt%20Gateway%20Project.htm

Gateway was expected to become alive in early 2007 (Sabah, 2006). 17 months later, in year 2006 progress is evaluated as poor. Therefore, TURKSAT has been assigned for the duty instead. E-Okul has also been launched by Ministry of Education in 2006. The very same year, Turkish Investment Portal and National Information Society Strategy were launched. In May 2007, the 'Regulation of Internet Publications and Combating Crimes Committed through such Publication' Law No. 5651 entered into force[5].

The focus of this paper is e-Government Gateway, which currently appearing in newspapers for its planned opening in December 18, 2008 (CNNTurk, 2008). E-Government Gateway is defined as the provision of all e-government applications through a main portal so that all government services are accessible from a single site (Kumas, 2007; Tutkun, 2007; Sungu, Sungu et al., 2008). *"Once the e-gateway or the portal is created, the service will be extended to include other communication devices like cell phones and pocket PCs, and users can access the system with smart cards or imprinted digital certificates for a secure transaction. Content management and the usability of the portal will be a major cornerstone of the gateway, and with a payment/banking module, each electronic service will get a central authentication mechanism to enable payments and money transfers between the government agencies[6]"*. In a recent research, Acar and Kumas stress the importance of e-Government Gateway for Turkey's route towards modernization and becoming a citizen centric government (Acar and Kumas, 2008).

A team of 40 specialists has (CNNTurk, 2008) undertook the development of e-Government Gateway at TURKSAT. In terms of ANT approach, the *local network* consists of this team. However, it should be noted that prior to 2006, Oytek Technologies was in charge. The shift from contract awarding institution to the project developer one has re-defined the role of TURKSAT. On the other hand, *global network* of e-Government Gateway has a frankly complex structure[7] (Figure 2).

[5] eGovernment Factsheets – Turkey http://ec.europa.eu/idabc/servlets/Doc?id=30867

[6] http://www.turksat.com.tr/english/index.php/e-Government-/e-Government-Gateway-Project/What-is-e-Government-Gateway-Project.html

[7] http://www.observatory.gr/files/news_events/summit_presentations/Presentation%20Recep%20Cakal.pdf

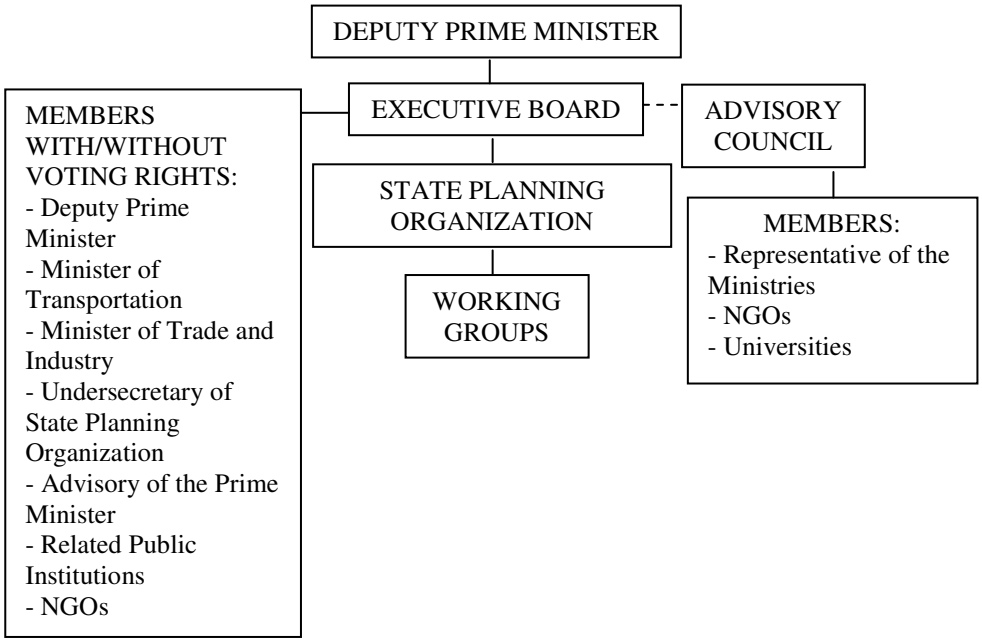

Figure 2. e-Transformation Turkey Project Organization Structure

In ANT terms, *problematization* took place when the responsibility of e-DTR has delegated to the Information Society Department. Information Society Department has been assigned as the *obligatory passage point (OPP)* as it acts as the medium among various government institutions and TURKSAT. There are 43 different types of e-government services at various stages of e-provision (BTD, 2005). However, only 25 e-government services are proposed by 8 government agencies for the initial stages of e-Government Gateway (e-DTR, 2008). 23 of these 25 services have been determined as ready for integration with the e-Government Gateway (Table 2).

Table 2. E-Government Gateway Action Plan

	Activity	**Responsible Agency**	**Date for Agency to be Ready for Integration**	**Date TURKSAT Plans for the Service**
1	Exam Results Inquiry	Ministry of Education	Dec 2008	Dec 2008
2	Complaint Results Inquiry	Ministry of Industry and	Dec 2008	Dec 2008

		Trade		
3	Complaint Number Inquiry	Ministry of Industry and Trade	Dec 2008	Dec 2008
4	Advertisement Complaint Submission	Ministry of Industry and Trade	Dec 2008	Dec 2008
5	Consumer Judge Commission Inquiry	Ministry of Industry and Trade	Dec 2008	Dec 2008
6	Consumer Association Inquiry	Ministry of Industry and Trade	Dec 2008	Dec 2008
7	• Warranty document • After sales services • Competence document • Authorization document for door-to-door sales • Turkish user manual inquiry	Ministry of Industry and Trade	Dec 2008	Jan 2009
8	e-Military Drafting: Updating residency address information	Ministry of Defense	Dec 2008	Jan 2009
9	Vehicle Inquiry	Security General Directorate	Dec 2008	Jan 2009
10	Driver Penalty Points Inquiry	Security General Directorate	Dec 2008	Jan 2009
11	e-Tax Registration Certificate	Revenue Administration Department	Dec 2008	Jan 2009
12	Citizen Information System: Access to Summaries of Cases seen in Courts	Ministry of Justice	Dec 2008	Feb 2009
13	e-Military Drafting: Online delivery of information for classification	Ministry of Defense	Dec 2008	Feb 2009
14	e-Military Drafting: Choosing drafting period	Ministry of Defense	Dec 2008	Feb 2009
15	e-Military Drafting: Military mobilization maneuvers	Ministry of Defense	Dec 2008	Feb 2009

16	Access to Civil Servant Payrolls	Ministry of Finance	Dec 2008	Feb 2009
17	Consumer Complaint Submission	Ministry of Industry and Trade	Dec 2008	Feb 2009
18	e-Military Mobilization: Processing Assignments	Ministry of Defense	Dec 2009	Mar 2009
19	e-Military Mobilization: Roll Calls	Ministry of Defense	Dec 2009	Mar 2009
20	e-Military Mobilization: Processing Logistics Assignments	Ministry of Defense	Dec 2009	Mar 2009
21	Information Desk for Traffic Accidents	Security General Directorate	Dec 2008	Mar 2009
22	Driver License Permanent Cancellation Inquiry	Security General Directorate	Dec 2008	Mar 2009
23	e-Passport Application and Control System	Security General Directorate	1st Quarter of 2009	1st Quarter of 2009

source: (e-DTR, 2008)

4. CONCLUSION & FUTURE RESEARCH

Actor-Network Theory is a well established approach to (Stanforth, 2006; Jarke, 2007) explain application of IT projects in developing countries (Stanforth, 2006), particularly the e-government services. As Heeks and Staforth (2007) underline, a great number of e-government projects result in failure. Therefore, it is crucial to closely examine e-government projects to draw lessons for future. Popularity of ANT is increasing to better understand the trajectories of e-Government projects (Trusler, 2003; Avgerou, Ciborra et al., 2006; Heeks and Stanforth, 2007; Johanes and Kwong, 2007; Hardy and Williams, 2008; Muganda-Ochara and Belle, 2008). In this paper, we have presented a literature review of ANT and explained its central concepts. A brief overview of e-Government Gateway Case has been presented by the ANT perspective. Further research should focus on developing a deep and detailed case study by collecting primary data from the project network human actants. In terms of non-human actants, an interesting current issue raises interest for research. 3G licences' contracts, which enable faster and cheaper data transfer from/to mobile phones, are recently awarded in the case of Turkey. Therefore, our expectation is that mobile phones would be also used for access to e-Government Gateway in the near future. Thus, the nature of the network is expected to change and re-defined.

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