9-2010

EVALUATING AND RANKING LOCAL E-GOVERNMENT SERVICES

Ronit Purian
Tel Aviv University, Israel, purianro@post.tau.ac.il

Niv Ahituv
Tel Aviv University, Israel, ahituv@post.tau.ac.il

Phillip Ein-Dor
Tel Aviv University, Israel, ahituv@post.tau.ac.il

EVALUATING AND RANKING LOCAL E-GOVERNMENT SERVICES

Ronit Purian, purianro@post.tau.ac.il
Niv Ahituv, ahituv@post.tau.ac.il
Phillip Ein-Dor, eindor@post.tau.ac.il
Tel Aviv University, Israel

Abstract

The evolution of E-Government provides the opportunity to explore Information and Communication Technology (ICT) adoption by individuals and organizations. A systematic study of local e-government has provided important insights into this topic. This research created an in-depth index of the local e-government in Israel, and consequently contributed to the establishment of a theory on ICT acceptance and management. 88 Internet websites of local authorities were evaluated. In an attempt to understand the differences between them, questionnaires and interviews were carried on among managers in local authorities. This study draws a line from the individual's digital literacy to her ability to intuitively accomplish the normative principles of Information Systems (IS) planning and implementation.

Keywords: e-government, technology adoption, IS evaluation.

1 INTRODUCTION

E-government is an ideal context for studying ICT as a tool for open flow of information and decision making (Ahituv, 2001; Paivarinta and Saebo, 2006; 2008; Saebo et al., 2008). The definitions for e-government expose the variety of attitudes towards this concept: from an operational point of view to a focus on citizen empowerment and e-participation. The variety raises the question: what variables will produce a reliable and valid e-government evaluation scale and index? The evaluation of e-government depends on its objectives, whether measuring return on investment, users' satisfaction, variety and quality of services, or democratic ideals.

This research followed two main lines: creating the local e-government index in Israel as dependent variables; and consequently developing a theory on ICT acceptance and management. Four sub-indices were extracted by factor analysis: contact with the public (Contact); managerial effectiveness (Effectiveness); efficiency in basic service provision (Basic Efficiency); and efficiency in advanced services provision (Advanced Efficiency). Questionnaires and interviews were conducted with managers in local authorities, in an attempt to explain why some organizations "use ICT more successfully than others" (Benbasat et al., 1987; p. 382).

The study assumes that it is the individual, rather than organizations or governments, which make the difference in the composition of the local authorities' websites. For example, according to the index, the superiority of the three largest municipalities in Israel is limited to their grades in Basic Efficiency, but scored low in the other three sub-indices. Small local authorities provided more communication channels with the public, hence they are the leaders of the Contact sub-index. The technologies that support the Contact category are relatively simple and inexpensive; motivation to be in contact with the citizens is the main required resource. The ability to apply deep public concern through professional IS decisions is an intangible condition, and not very prevalent.

The interviews revealed an intuitive approach to IS and Internet website planning and implementation. The leading ICT managers did not follow any of the detailed life-cycle rules, and yet, in their unique way, they fulfil normative requirements such as defining user's needs and demands. The findings supported the proposed theory.

1.1 E-government evaluation

For the purpose of this study, the following definition of e-government was adopted: E-government is "the application of information and communications technology (ICT) to enhance and improve the relationship and interaction between citizens and the government at large, including municipalities and other public authorities" (ELOST, 2006; p. 59). The evolution of e-government extends from full transactions and interactive services to public participation in democratic processes (Ein-Dor and Segev, 1993). Layne and Lee (2001) suggested a four stage model for e-government: cataloging, transaction, vertical integration, and horizontal integration. These four stages were explained in terms of the complexity involved and the different levels of integration (Lee, Tan and Trimi, 2005). An analysis of main evaluation methods was proposed by Kunstelj and Vintar (2004). Their model integrated measurements of the back-office and the front-office, the environment, the maturity of the government, citizens and businesses, and its impact. By reviewing the vast scope of evaluation methods, it became clear that the local e-government index applied in this study should be much more simplified and systematic. This index is one of just a few sources of information on e-government in Israel. Moreover, it is the first initiative to examine all local e-services. For this reason, the focus was on a concise mapping of the basic services and types of information provided by local authorities' IS in their official Internet websites.

2 METHODOLOGY

This study developed the "structured observation" (unobtrusive measure), allowing the methodological measurement of features by browsing an Internet website. The structured observations were performed

by a researcher who was not involved in the interviews, and thus could not influence or be influenced by the findings.

The local e-government index quantitatively examine the information and services supplied online. The assessment tool did not include qualitative estimations of content, style, interface and user-friendliness. The measured features were listed in detail by an objective group of experts and policy makers, based on the national e-government report. The variables were:

- Online services: citizen's record; downloadable forms (for print); online forms (filling and sending via the website); online payments; online processes.
- Information and data: online databases; publication of public biddings; information on officials; information on small and medium enterprise (SME) licensing.
- Communicating with the public: email addresses (in relation to number of officials); application form (to fill and send online); newsletter (subscription for news service by email); forum for open discussions (content is taken into consideration); RSS.
- Accessibility and usability: number of languages; compatibility to various browsers.

2.1 Independent variables

Information on the local authorities was retrieved from the Central Bureau of Statistics (CBS) to examine the relationship between the local e-government index and the socioeconomic, financial and demographic variables. Correlations between the local e-government index and (1) municipal socioeconomic status; (2) municipal expenses (and deficit) per capita; (3) the number of inhabitants in a municipality; and (4) municipal demographic composition were tested. These variables should be excluded as alternative explanations.

A qualitative study provided an important addition to the explanatory variables. Semi-structured interviews were conducted with managers and other stakeholders in the local authorities, and covered personal as well as professional issues. Most of them served as Chief Technology Officer (CTO) and Chief Information Officer (CIO) with no clear distinction. The questions and topics were:

- Engagement with new media entertainment: old computer games; online games; gadgets (iPod). How often, how much time.
- Enthusiasm as a dedicated worker: describing the first steps in their job; work politics; availability of resources and top management support.
- Technology Sophistication: professional experience and knowledge in various areas of IS and Internet websites.
- Initiating strategic and operational projects in the local authority.
- Initiating joint projects with other local authorities: managerial preferences towards cooperating with other authorities; recognizing mutual interests; developing new business models to overcome financial barriers.
- Perceived Usefulness: satisfaction with the authority's IS and Internet website.
- Non-conformism: cherish the independence; aware of its pitfalls.
- How do you plan the interface with the citizens? Citizen-oriented considerations; needs survey.
- How do you plan the interface with the workers? Understanding their needs and constrains.

3 RESEARCH QUESTIONS

After creating the local e-government index, the following set of hypotheses was investigated: Local e-government grade is correlated with: (1) municipal socioeconomic status; (2) municipal expenses (and deficit) per capita; (3) the number of inhabitants in a municipality; (4) municipal demographic composition.

The questionnaire and semi-structured interviews were conducted under research questions such as: What are the motivating forces in local authorities that create the differences between their websites? What is required in the municipality in order to transform public policy into practice using ICT? This study explores the unique role of the manager in the organization, and more specifically, the ICT managers as "powerful actors" (Fountain, 2001; p. 8).

4 RESULTS

Financial, socioeconomic and demographic variables did not explain the variance in the grading of local governments according to the local e-government index.

Medium and large authorities, which obviously are of medium to high income levels, received the highest grades. Their socioeconomic level (ranked in tenths) was varied: Tel Aviv, a large city in the middle-upper class (8th tenth), was ranked 17th; Jerusalem, the capital of Israel, which is in the lower-middle class (4th tenth), was ranked 25th. Lagging behind, at 37th, was a small upper-class local authority named Savion (10th tenth).

Computed statistics, using Factor Analysis, divided the authorities into four categories as presented in Table 1. The leading authority in each of the four categories was selected according to its grade in the factor's variables.

1. Efficiency	2. Basic Efficiency	3. Contact	4. Effectiveness
Citizen's record Compatibility with Firefox Num. of online processes Num. of online databases Num. of online forms Newsletter	Num. of forms to print Num. of online payments Num. of languages	Compatibility with Explorer Email addresses Staff names and contact information Num. of biddings Num. of online forums	Licensing SME Application form RSS

Table 1. Four types of Internet websites according to factor analysis

The sub-indices provided high accuracy in analyzing and understanding the decisions made by managers. According to the sub-indices, larger cities that have more resources are not necessarily "expected to exhibit the best quality Web sites" (Scott, 2005; p. 156). Their size superiority enabled them to provide Basic Efficiency services; but not inexpensive services that depend on the managements' attitudes towards openness and communication with the public. Therefore, this study proposes more specific and selective conclusion: larger municipalities can afford the implementation of basic and large-scale services, and, indeed, they do; small local authorities may obtain relatively higher contact with the public.

Interviews with the leading authorities support the structure of the four sub-indices:

- Managers in the leading authority – both in the final index and in the Efficiency sub-index – expressed clear targets, with an accessible service delivery to the citizen as top priority.
- Managers in the largest municipalities, that were top leader in the Basic Efficiency sub-index, emphasized project management.
- A small authority (local council), the leader in Contact sub-index, is headed by an enthusiastic mayor that believes in the benefits of transparency and public debate. For example, on the website he exposes valuable information on building plans using mapping systems (GIS) and pictures.
- The IT managers for the leading authorities in Effectiveness sub-index are skilled managers, who tend to be more community aware, and operate in a politically sensitive environment.

Tools for IS development have been in the literature for years, and yet, there was not a single ICT manager in our study that followed any of the detailed life-cycle rules. Ahituv, Neumann and Riley (1994) presented rigid procedures that should be imposed on the IS development cycle (ISDLC). The authors emphasized: "We do not advocate a return to a haphazard, individual, intuitive approach to ISDLC. On the contrary, a commonly accepted framework is absolutely essential" (Ahituv, Neumann and Riley, 1994; p. 299). In the authorities studied here, the "individual, intuitive approach to ISDLC" was widespread but not haphazard. The organizations enabled individual managers to intuitively plan and implement IS and Internet websites.

5 CONCLUSIONS

In the changing nature of e-government, ICT managers are actually shaping the public sphere. This research extended the notion of ICT adoption to a whole view of the individual in the organization: from a user's digital literacy to a manager's ability to intuitively accomplish the normative principles of IS planning and implementation. The next stage is to build a solid theory about the relationship between IT acceptance and management.

A previous study (Purian, 2010) developed a new original concept, Technophilia, as a powerful model for ICT adoption at the individual level. The results, distinguishing the "individual, intuitive approach", support the technophilia model that should be further developed. In addition, the results provide evidence to the reliability and validity of the e-government index.

5.1 Contribution and Future research

The major contribution of this study is the development of an index that evaluates and ranks the e-services provided by municipal authorities. The index can be used over years and produce a time series that will enable researchers as well as governmental decision makers to follow the advancement of local e-government services. Future research should consider additional features that were not widely used a few years ago, such as social networks, mobile services, policy-oriented ICT and more.

In terms of methodology and data sources, this study captures the richness of data by multiple methods: questionnaires, interviews, and structured observation of local websites as outputs of the unit of analysis. The aim is to open the "black box" and "examine processes in order to better understand the effects of information technology on the people who work with it, and their influence on the technology. The intent is to carry out a detailed, in-depth examination of a small number of individuals" (Benbasat et al., 1987; .383) and obtain detailed data about their units. This research proposes a promising way towards this aim.

References

Ahituv, N. (2001). *A World without Secrets: On the Open Information Society*. Am Oved Publishers, Tel Aviv Israel (in Hebrew).

Ahituv, N., Neumann, S. and Riley, N.H. (1994). *Principles of Information Systems for Management*. Revised fourth edition, New York: Wiley.

Benbasat, I., Goldstein, D.K. and Mead, M. (1987). "The Case Research Strategy in Studies of Information Systems", *MIS Quarterly*, Vol. 11,pp.369-386.

Ein-Dor, P. and Segev, E (1993). "A Classification of Information Systems: Analysis and Interpretation". *Information Systems Research*, Vol. 4(2), pp.166-204.

ELOST (2006). "Foresight Study, in The ELOST Consortium: E-government for LOw Socio-economic sTatus groups". Israel and Austria.

Fountain, J.E. (2001). *Building the Virtual State: Information Technology and Institutional Change*. Brookings Institution Press.

Kunstelj, M. and Vintar, M. (2004). "Evaluating the Progress of E-government Development: A Critical Analysis", *Information Polity*, Vol. 9,pp.131-148.

Layne, K. and Lee, J. (2001). "Developing Fully Functional E-government: A Four Stage Model". *Government Information Quarterly*, Vol. 18,pp.122-136.

Lee, S.M., Tan, X. and Trimi, S. (2005). "Current Practices of Leading E-government Countries". *Communications of the ACM*, Vol. 48,pp.99-104.

Paivarinta, T. and Saebo, O. (2006). "Models of E-democracy". *Communications of the ACM*, Vol. 17,pp.818-840.

Paivarinta, T. and Saebo, O. (2008). "The Genre System Lens on E-Democracy". *Scandinavian Journal of Information Systems*, Vol. 20,pp.51-82.

Purian, R. (2010). "Technophilia: From Entertainment to Digital Literacy and E-government – A New Multilevel Concept for Technology Adoption". Unpublished Doctoral Dissertation. Tel Aviv University, Tel Aviv, Israel.

Scott, K. J. (2005). "Assessing the Quality of Municipal Government Web Sites". *State and Local Government Review*, Vol. 37,pp.151-165.

Saebo, O., Rose, J. and Flak, L.S. (2008). "The Shape of eParticipation: Characterizing an Emerging Research Area". *Government Information Quarterly*, Vol. 25,pp.400-428.