eGovernance: Relation Theory of the Impact Factors

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A research work presented in the paper establishes that the overall goal in public sector is better governance - helping to narrow the knowledge divide and its consequences between societies and also within each society so to stipulate eDemocracy. The learning process narrow divides between those societies who can accumulate, manage, when/how to share, and when to use knowledge and those who face obstacle and challenges at one ore more stages in the sequence from acquiring knowledge to use. A strong linking of all factors (social, economic, technology) and their proper transform order are the winning solutions. The answer lies with recognition of peoples dimension: knowledge (people's and organization's), sharing and networking knowledge and information, learning, and organizational issues encouraged with economic dimension (rewarding, budget, and financing) and driven by new technology solutions. Therefore, Information and Communication Technology is a general "driving" force that makes Knowledge Management, Learning Organization, and eGovernance more important activity than in the past.

Povzetek: članek opisuje pomen informacijskih in komunikacijskih tehnologij za upravljanje v informacijski družbi.

1   Introduction

The strategic impact of new technology, new organizational principles, and new knowledge paradigm is bringing influence to our everyday life. Main characteristic of usage of new technology is introducing intelligent environment where information creation and communication and as well intercommunication can be provided through different technologies. This new digital venue also affects a public sector and within it a public administration. Studies of public sector organizational governance and related building blocks have been published as strategies and research papers, Internet sites, books, since development of new technologies. Presented paper is adding new dimensions in the field of digital venue and impact factors that influence good eGovernance.

The information communication technology (ICT) is an infrastructure that supports an electronic venue of an organizational social environment. In the study it is represented by: iGovernment - converting existing processes and paper objects to digital form and eGovernment - converting literal services to virtual services. Here I would like to stress the difference in notion of eGovernment. It is most of the time understood as a whole digitalization of a government; this conception brings only one dimension in the government practice - digital service orientation, skipping two important organizational dimensions: knowledge management (KM) and learning organization (LO).

Therefore, next researched issue was knowledge and knowledge management. Knowledge is the most important "asset" of today's organizations. Further on, a non-stable environment is shaping the enveloping organizational culture - a learning organization that is suitable to apply occurring changes. To govern the whole system of a modern public organization all three previously mentioned items (ICT, KM and LO) are mandatory for good governance and not only eGovernment solutions. In such a manner can be stipulated better democracy that is in favour of the whole society.
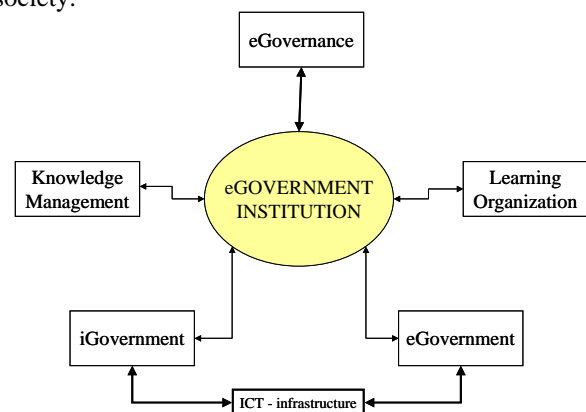

Fig. 1: Research model: "building blocks" and their relations

The research work focuses on the study of a public administration. A practice that is best understood as a system, with multiple external and internal factors, which shape the behaviour of participants, activities of programs and ultimate outcomes [5]. The terminus "public administration" was used in the study for public entities and their relationships with each other and with the larger world through eGovernance system narrowed to: how public sector organizations are organized and managed to accomplish their responsibility.

1.1   Introduction of Terms

As a definition, **Information and Communication Technology** (ICT) can be defined as "electronic means of capturing, processing, storing, and communicating information" and is based on digital information held as 1s and 0s, and comprise computer hardware, software, and networks [1]. Two breakthrough inventions formed the Information Society's foundation: computers and telecommunications. Computers deprive humans of their monopoly on "intelligence" and perform the predictable, routine intellectual tasks. Telecommunications, in turn, ensures common access and information (1s and 0s) spread to all computers connected to network and/or Internet. **Knowledge management** (KM) typically means the systematic management and use of the knowledge in an organization; more abstrusely: "the leveraging of collective wisdom to increase responsiveness and innovation" [Delphi Consulting Group[1]]. The **Learning Organization** (LO) [are] organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning to see the whole together [6]. **Government** is the system or form by which a community or other political unit is governed. Governments produce huge volumes of information and an increasing amount of it is available through electronic venues, the Internet, and other electronic means. **Governance** understood in presented research work is the exercise of economic, political, and administrative authority to manage the nation's affairs at all levels. It comprises all the mechanisms, processes, and institutions through which the citizens and groups articulate their interests, exercise their legal rights and obligations and mediate their differences. The concept of **eGovernance** relates to the preparation of government as it reacts to information, technology and communication trends on its traditional governance role in society [4].

1.2   Reflection On Research Frame

Governance is the main process done within government. For this process, several factors are important. Learning organization is suitable solution where new confronts are implemented and brought by an information technology.

As well new eDemocracy paradigm is stimulating novel way in interactions between public sector and citizens. Knowledge and knowledge management are obviously of fundamental ingredients in supporting correct decisions and through that governance. Therefore, how one can establish a knowledge sharing culture (meaning accumulate, store, access, share, use tacit knowledge in the heads of individuals on the organizational level, as well as "corporate knowledge") within public institutions and as well with citizens and organizations? What impact does this knowledge-sharing culture have on governance? What is the role of information communication technology in this respect? Are civil servants suitable equipped (knowledge, infrastructure, etc.) to take care of eGovernance? Are the organizational incentives important in workers behaviour? Is learning process essential to govern? Conventionally, ICTs have been used within governments for automating processes, replacing clerical labour with its digital equivalent (writing documents, written instructions etc.). eGovernance should be therefore seen as a compound made up of different blocks [7]:

- ICT that support communication between government and civil society,
- Managing institution(s), governmental information and knowledge, and
- The societal and economic effects of electronic democracy.

In 1999, the European Commission proposed a new *e*Europe (within pursuit for a communication on the role of eGovernment for Europe's future[2]) initiative to speed up Europe's entry into the digital age and to ensue coherence in the pace of progress of its Member States. The objective of the *e*Europe initiative was an ambitious one: to bring every citizen, school and business on line and to exploit the potential of the new economy for growth, employment and inclusion. The Commission presented the initiative to the Lisbon European Council in March 2000.

1.3   Scope

The primary aim of the research was to study the objectives and relation impacts of the ICT on the performance of public organizations. A further aim was to analyse the correlation between knowledge, learning organization and improvements in organizational performance (eGovernance) within the public institutions. A public administration influences through its efficiency and effectiveness the whole value-chain (taxation: rise or lowering) on state economic scale. While the efficiency and effectiveness analysis, [or estimating "return on investment" (ROI)] is important it was not studied within the scope of this research. The same apply for the value-added effects.

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[1] See:
http://www.delphigroup.com/coverage/knowledge_mana gement.htm, Feb. 2004

[2] See:
http://europa.eu.int/information_society/eeurope/2005/all _about/egovernment/index_en.htm, Oct. 2003

V1_1 organization

			Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1,00	Ministry	14	9,8	9,8	9,8
	2,00	constituent office	10	7,0	7,0	16,8
	3,00	local government	53	37,1	37,1	53,8
	4,00	munincipality	46	32,2	32,2	86,0
	5,00	government office	20	14,0	14,0	100,0
	Total		143	100,0	100,0	

Table 1: *Demographics of research population*

For the purpose of the study a survey was drawn. It was used to gather needed data and prepare ground for a theory development that supports interpretation of strategic influences. Based on information gathered from respondents (e.g. institutional information, education level, information infrastructure, budgeting process, etc.) the survey also sought to clarity influence of information communication technology on digital information (iGovernment) and digital services (eGovernment). Analysis more broadly represents also an accumulation of information on the respondents' level of agreement with statements concerning knowledge management and information communication technology. The examination of background information is important because it was hoped it would be possible to focus on the characteristics and factors that enhance the importance of knowledge, ICT infrastructure, and budgeting as well as intangible resources to organizational performance. In the last part of the survey, respondents were asked to pick out those factors and elements of staff motivation that are of special concern to them. Educational level of employees and their training habits were also included in survey questionnaire. Clarifications of stated problems are anticipated through gathered information about respondent.

A total of 288 different public organizations participated in the survey. The breakdown of replies received was as follows:
- From ministries: 100%.
- Local government authorities: 94.6%.
- Government offices: 83.3%.
- In total of 22.9% of answers came from municipalities.

1.4 Theory Background

Through explanation of stated research frame, a pattern development was examined. Research work then comprised of merging predefined "organizational segments" in blocks to investigate theirs relations and enable study of impacts. To aim or navigate the correct procedures that attain this type of research work a **block relationship theory** [2] (BReT) was deployed. The origin of developed BReT model is in an empirically tested pattern developed through study case that make

possible to investigate important relations within organization and offers some explanatory outputs:

- Information communication technology (ICT) (Infrastructure, eService, Internet, Policy)
- Organizational issue (Organizational initiative, Educational Level, Permanent Education (Training) Rewarding System)
- Knowledge Management Issues (eCapture of Staff Competency, Information and Knowledge Network, Knowledge Responsibility)
- Budgeting.

It is designed to estimate and test through Structural Equation Model, multivariable linear relationships among *latent* - explanatory variables that operate basic theoretic concepts and *manifest* - dependent variables measured by latent ones. A computer tool - Lisrel "Structural Equation Model of multivariable linear relationships" was used in calculating pre-defined relations and to "weight" their correlations.

2 Theory: Reflections and Findings

The emergence of the new *information communication technologies*, organizational issues (*learning organization*, etc), and consciousness of *knowledge management and networking* importance are driving factors that propel organizations through changing real and virtual environment. In addition, governments worldwide, on all levels - from state to local, are seeking to harness the potential offered by these new technologies and organizational concerns to create new dimensions that describe good eGovernance. A new paradigm is emerging: Knowledge networks and communities transform the digital convergence into people-centered development that beat the digital divide by narrowing the digital gap (also) through eGovernance. The primary role of eGovernance supported by learning, knowledge management and networking is to ensure that the stress is placed on decision-making (doing the right things) and not on increased efficiency (doing things right). Good eGovernance integrates information communication technology that enables governance to carry out the tasks with better control across time and space. An important aspect of eGovernance is the

relationship between government (state and local) and other society's stakeholders (citizens, business, civil society organizations).

Within BReT the manifested variables were constructed to study relation and behavior, of gathered data. The iGovernment variable shows how organizations register working processes: from paper to digital expert systems. Variable shows that digital compilation is well expanded. Confirmation of researched results of well-applied ICT infrastructure within Slovenian organization [3] can be shown also with high statistical reliability of this variable. The eGovernment variable shows how public organizations internally use digital services provided by technology and theirs participation with joint eAdministration project(s). An even distribution was found, meaning that most Slovenian organizations use digital services in a very dedicated form. They are using mostly fundamental (e-mail, e-calendar, etc.) digital services. Only one quarter of organizations, exploit bundled digital services at their work. eGovernment variable in the field of e-services as: approvals of car licenses, tax payments, or other life situations, and legislation, budget spending, etc. confirms that institutions are not using them for external user.

The Knowledge Management variable is a viewpoint type of scale. It is measured with Likert scaling method and represents average of opinions of top management. Important factors (rewarding system, decentralization, knowledge officer, etc.) that accelerate KM and are not well enforced, therefore top management of Slovenian administration organizations has somehow loosen perception on how to exercise in practice KM by their employees. Survey results shows that they have their self-evaluated perception that is higher than can be proven by other survey data.

The Learning Organization variable represents an organizational assist and track to its employees' educational necessity. It is a composition of data (in percentage) representing professional educational aim. Research proved that gaining higher professional knowledge is more applied within Slovenian organizations than other types [languages, ICT (learning text processors, spread sheets etc.), and other] of study programs. Comparing with results shown from other correlations derivate from study that lower educated staffs attain less training than those with higher education can indicate that gaining better or new expert knowledge is limited to those that already have their profession. Others do not yet realize or do not have possibilities to upgrade their education.

The final studied manifest variable is eGovernance. It is composed with different indicators. Three types of data groups are used to calculate this variable. First consist of dichotomous-like [YES/NO] data and shows if

organization has its own Internet connection. Next group is composed with organizational issues concerning how institution acts outward(s) [measured through replays to incoming e-mail(s)]. Through this, principles to understand new tools and new digital venue philosophy that are important for good digital governance can be tested. Last group illustrates a level of service digitalization used by institution. It is based on OECD four-stage measuring principle and weighted. Due to complexity of calculation of eGovernance manifest variable, an explanation of it can be only shown through a BReT model with which measurement of non-direct measurable conceptions (eGovernance) can be measured with direct measurable indicators (policy, budget, etc.).

The model has proven the researched hypothesis. Although, it has some limitations:

- A relative adequacy presentation of an actual phenomenon
- A model and a real presentation are not identical
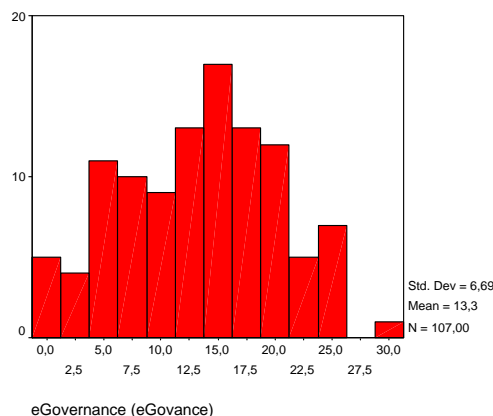- A "working" model means a relative suitability of a real observable fact(s).

Fig. 2: *eGovernance - variable*

A BReT is a LISREL type "covariance structure" model and has 150 connections - linear structural equations. An impact between all variables is present within a model. Impacts between variables are shown on arrows that connect variables. Higher values represent impact that is more significant. Only for the eGovernment manifest variable an impact from the iGovernment manifest variable was build by the LISREL showing that an importance of digitalization of documents is influencing eServices. Arrows with values that are oriented to manifest (green box) variables are showing unexplained (external) influences. A problem concerning 143 items that were observed in 150 equations influences a reliability of the model. Nevertheless, a null hypothesis value of the "root-mean-square error of approximation" (RMSEA = 0.040) index being less than 0.080 shows that
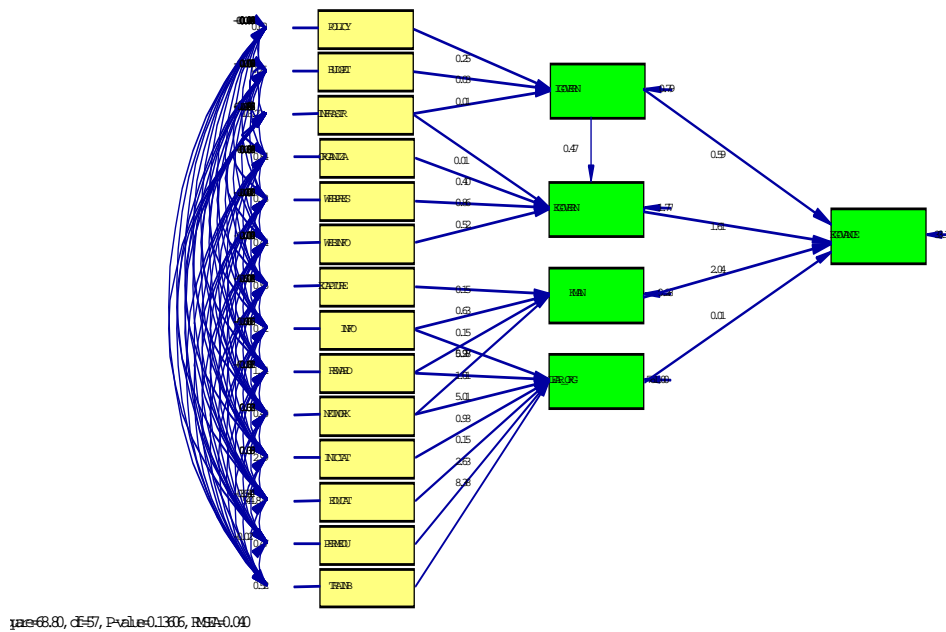
Fig. 3: *Block relation theory – BReT: variables model representation*

model stands well. The "significance" (P-value = 0.13606) greater than 0.05 is typically considered "close fit". The "degrees of freedom" (df = 57) greater than zero allows power to calculate a model. Therefore, a statistical value for a Gauss distribution ($\chi^2 = 68.80$) significantly **validates an acceptance of the model.**

3 Conclusion

From research work a strong linking of all mentioned factors (social, economic, technology) and their proper change orders are the winning solutions for better eGovernance. The solution lies with recognition of *peoples dimension*: knowledge (people's and organization's), sharing knowledge and information, learning, and organizational issues back-up then with *economic dimension*: rewarding, budget, and financing and driven by *new technology solutions*. If only one is missing the effectiveness and efficiency of good eGovernance cannot be achieved. Therefore, ICT is a general "driver" force that makes KM, LO, and eGovernance a more important activity than in the past.

As suggested in the analysis and the research results [8], the way organizations reward workers for their behaviour is generally a good indication of where organizations stand in terms of promoting this behaviour. As is to be expected from the results of the overall achievements of KM practices, the organizational structure of central government bodies seems not to have entirely accompanied or supported cultural changes in within their staff. A strategy of knowledge management is sterile if it does not also provide for a continuous learning process.

The lack of a reward structure for knowledge sharing and the apparent focus of organizations on technology while (sometimes) underestimating the importance of the human factor, as well, relative managerial resistance to the implementation of Knowledge Management and Learning Organization strategies (middle managers have the most to lose from more horizontal knowledge-sharing) and the absence of new governance mechanisms accompanying the changing responsibilities, are classic limitations on the implementation of good eGovernance policies. These topics, all of which relate to change strategies and the obstacles to change, are suggested for further research.

Overall, the challenge to good eGovernance, as faced by the public administration sector, is how to implement a broad change strategy that goes well beyond the introduction of an ICT-enabled digital venue in which to locate many of the structures and processes of governance. It includes changes to the culture of service provision, as well as to the cultures of knowledge management and learning organization behaviour.

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