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THE RICHNESS OF BARRIERS TO PUBLIC PARTICIPATION: MULTI-LAYERED SYSTEM OF REAL ESTATE DATA FROM MULTIPLE SOURCES

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Abstract

Information systems (IS) in the public sector are expected to utilize technology to the benefit of society. Making data available to the public is therefore a required action. Indeed, collaborative online systems that provide free tools for data aggregation and visualization demonstrate the potential value of online access to data. The integration of information from multiple sources creates new valuable information that serves the public interest economically, socially, and environmentally. This paper examines the access to planning and real estate data, since land is one of the most substantial assets for citizens and governments. A geographical-interfaced IS was developed in order to prove the technological feasibility of a collaborative system in Israel. Nevertheless, data were not available. Examination has detected a variety of barriers that set strict limits on the collection and use of data that should be free. Open data could enrich the applicability of geographical interfaces, mash-ups and dashboards, thus improve transparency and fair access to information. If the public sector prevents public participation, the public could be the active producer of data. This study yields a working prototype; a new system that enables data entry by the users, i.e. the general public. A theoretical model that frames the findings is Leidner & Kaywort's (2006) technology-culture conflict. Theoretical and practical implications are discussed.

Keywords: E-government, IS evaluation, public sector, participation, collaboration, transparency, GIS, open data.

1   INTRODUCTION

The public sphere is going through a radical change following the creation of the web 2.0 practice of sharing. Bottom-up mechanisms of user engagement and civic participation are changing the ways we create information, consume and manage it (Noveck, 2009; Paivarinta & Saebo, 2006; 2008; Saebo, Rose, & Flak, 2008). Indeed, many studies examine the social impact of technology by referring mainly to online activities with the public, e.g. e-voting, open consultation etc. (Zhang, Scialdone & Ku, 2011). However, the adaptation of IS design and evaluation to the evolution of technology seems to neglect the larger organizational systems. By coordinating complex processes, the IS that affect environment and society, directly and indirectly, have the potential to make the bigger change.

Constructive communication between organizations and stakeholders is feasible technologically, and desirable ethically. However, persistent gaps keep separating the social needs from the technological materialization. Many organizations fail to integrate the social dimension in their business models and therefore struggle to survive. In some industries the risk is concrete; e.g. record companies, newspapers, and encyclopaedias could utilize technology for social purposes and by doing so to protect their own business competence. Neither has established YouTube, CraigsList or Wikipedia (Noveck, 2009), although their existence depends on the online trends.

The public sector is expected to act for the benefit of society; that is its raison d'etre. Even if the adaptation to new ICT is not critical to its survival, the efficient, effective and ethical performance is probably a clear interest. Technology adoption and innovation are among the available tools to achieve social goals. Yet, implementation efforts face, among other difficulties, bureaucratic barriers. The operational implications of the transparent approach are thus an important target of inquiry. How should decision processes change in the effort to understand preferences and expand alternatives (Henig & Buchanan, 1996) of various agents that raise different criteria? What are the factors that advance or hinder such developments?

In this study the availability of online information is examined in the context of public participation in planning (zoning and building). Real estate is among the most valuable assets to the public. The land is precious financially, culturally and environmentally. Many institutions, governmental authorities and civil stakeholders are involved and make it a complex, but most relevant issue for examination.

Internet websites of the authorities that hold planning data were studied, in different levels: the availability of textual information that addresses specific questions; the ability to retrieve data with queries to the database; and the ability to pull data automatically into geographical interfaces, mash-ups and dashboards.

Innovative websites that visualize open governmental data are described in this paper in order to demonstrate the potential economic, social, and environmental value of information. The roles of the main stakeholders are usually as follows: the public sector provides open access to databases; independent developers build engaging applications; and the public participates. Developers' collaborations, termed open innovation, are considered more efficient and timely compared to the estimated costs of paid workers; prolonged execution periods; and limited access to specialists that possess exclusive knowledge. Public participation is helpful in many ways; people can supply data from their close environment, or perform unique tasks, e.g. engage in taxonomy, termed folksonomy. Relying on the willingness of individuals in the wide public, termed crowdsourcing, requires mutual trust, otherwise the data are unreliable.

After developing an online system that was supposed to pull data from public databases and present them systematically in a single website, connection to the data was needed. However, the access to planning information was limited, and many technological options were eventually prevented. In this paper we describe the technological barriers we have encountered. One should not dismiss the richness of barriers.

Instead of the visualization of open data, which enhances public participation, the agencies block the information and consequently the public would have to take the role of data supplier.

In this case, different interfaces are required. Instead of automatic mash-up, online forms should enable data entry by the general public. Instead of streaming input, interactive maps should support non-sequential usage. And above all, the public is the active producer rather than the passive target audience of civil initiatives. The new system is under development. A Theoretical model that frames the findings is Leidner & Kaywort's (2006) technology-culture conflict.

1.1 Research goals

The purpose of this study is to identify and describe the organizational and technological factors that affect public participation in planning through the Internet. The research motivation is to understand how to create new valuable information when integrating real estate information from multiple sources. In accordance, the technological and institutional aspects are examined:

To what extent would municipalities and governmental agencies increase the transparency of real estate data; or block it? In other words, what is the feasibility of prevailing bureaucratic barriers?

What is the technological feasibility of online aggregation and visualization of real estate information?

First, Internet websites that utilize technology for social action are introduced to demonstrate the potential value of visualized aggregated information. The following section presents a variety of barriers that block the access to data and information of literally any type. Optional solutions are presented, in both the bureaucratic and technological level, and a new system is developed in order to prove the technological feasibility of such an interface in Israel.

2 FREE TOOLS AND OPEN DATA AROUND THE WORLD

In recent years many technological infrastructures have been developed and operated over the Internet for the free usage of the general public. The main characteristics of the platforms are the distinguished values of transparency and collaboration, and the welcoming design. The systems encourage users to retrieve and display data in a variety of charts and figures. The openness gave rise to new initiatives of data aggregation from multiple sources. With multi-layered display of information, the systems created new value. In this work we focus on data visualization displayed on maps.

2.1 Initiated by individuals: Swivel – www.Ushahidi.com

The Ushahidi platform (testimony in Swahili) was designed to map incidents of violence and peace efforts in Kenya based on users' reports. In later years it crowdsourced information in cases of catastrophe to support rescue efforts (Hagtun and Meier, 2010). Ushahidi also played an important role in political events such as elections in Arab countries before the riots, and more so with the outbreak of demonstrations in Tahrir Square. Other sites that offer similar geographic applications are crisscrossed and seeclickfix.

2.2 Initiated by the public sector: Data360 – www.Data360.org

The site and its associated software platform allow editors from around the world a convenient tool for updating and publishing visualized information. The site provides economic and social data, updated by government officials, citizens, and the site's staff.

2.3 Initiated by the private sector: Google fusion tables – www.Google.com/FusionTables

Fusion tables help to display information on maps. Two layers compose the product: a relational database that can be edited and saved online; and a geographic IS (GIS) that presents the data.

The public and the private sectors have embraced the collaborative arena in different ways, applying new system goals, now for the benefit of society. The following systems illustrate the potential.

2.4   Initiated by a cooperation of the public and the private sectors: LA Times LA Crime

Crime L.A. of the Los Angeles Times newspaper provides neighbourhood crime data. Data from the Los Angeles Police Department and Los Angeles County Sheriff's Department create maps and reports for hundreds of cities and neighbourhoods. User content about the community and official demographic data are among the layers. The system is built entirely on the basis of open software, free usage, and available data (Figure 1).
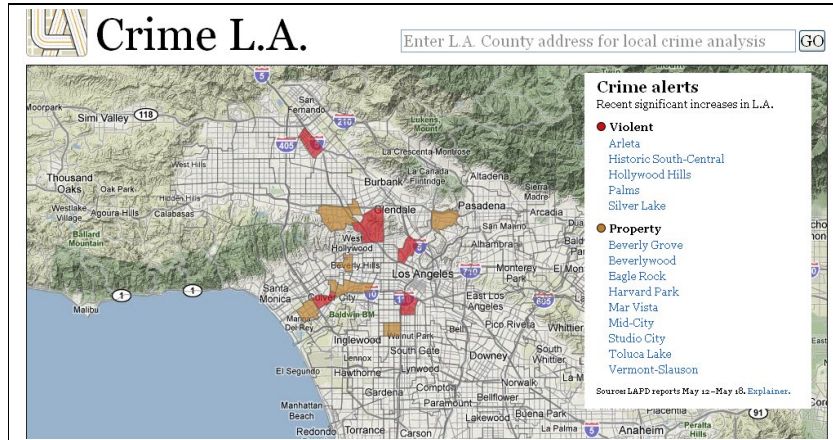

Figure 1. LA Crime home page

2.5   Initiated by the public sector: Recovery plan – www.Recovery.gov

The system provides a map interface for sharing information on the allocation of resources within the recovery plan introduced by the Obama administration (Figure 2).

Resources of three types: grants, loans or contracts, are represented as dots on a map of the United States, including Alaska and Hawaii.

The open government initiative facilitates data availability, and provides data visualization tools, e.g. bars and pie charts, text clouds, maps etc.
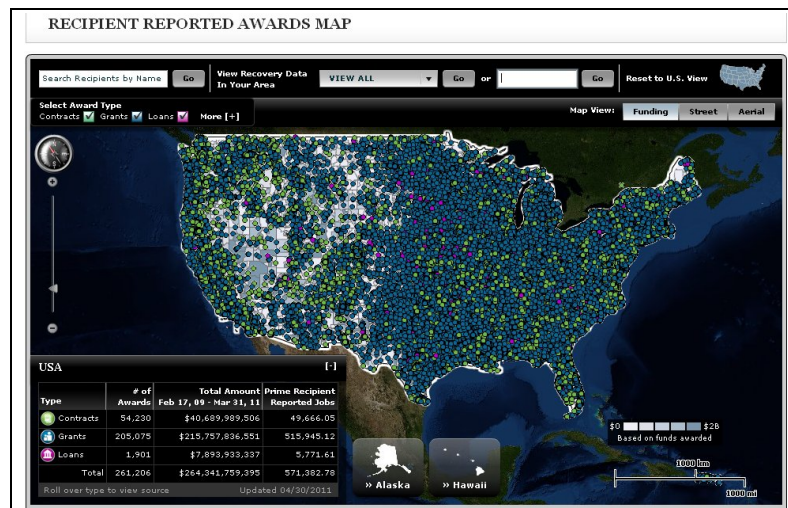

Figure 2. Recovery Plan screenshot

Along with the federal initiative, anchored in formal decisions, many local initiatives flourish in the public and private sectors, by NGOs and by social activists. That is, despite a possible conflict of interest, each sector has its presence in the new public sphere. Moreover, in each sector the active actors take part in the production, design, processing and distribution of information; with different considerations and strategy of transparency and collaboration.

2.6 Initiated by the private sector, partnering the public sector: The Omega Group – www.TheOmegaGroup.com

The business approach of Omega Group is of particular interest as it promotes the availability of information from governmental databases in a commercially useful way. Omega Group has recognized the gaps of information availability; between its storage by different agencies, its retrieval by the public, the attempt to create value, the need to protect privacy, and the ease of data entry and display. The Group cooperates with the stakeholders and avoids aggressive operations to collect data, e.g. data harvesting of governmental websites. In order to make governmental bodies act, the group creates useful tools for their own usage. Currently the company provides tools for schools, police and fire protection associations (Figure 3).

In fact, from a governmental viewpoint there are two types of end users: content editors, mainly agencies workers, are responsible for data entry, validation, and improvement, so that in practice the system becomes part of the organizational IT; content consumers, create value for the government with the visualization of the data they possess.

It can be said that the company's business approach is based on a barter in which the company provides governmental organizations with convenient visual tools; and in return earns the data that was entered and validated by the agency. Additional value for the governmental agencies is the potential decline in public inquiries. Citizens can obtain information easily and accurately, in different cross-sections; thus, the online interface outperforms consultation face to face or by telephone. One of the tools is CrimeView in which crime reports are displayed, according to different queries, as shown in the screenshot.

Figure 3. CrimeView Dashboard

The websites illustrate how cooperation with the public sector can create economic and social value with IS. It seems that while coordination efforts depend on trust and IT governance, the existence of the project depends on the need to act socially and the ability to utilize technology with other stakeholders. For the purpose of this study the innovative websites provide a benchmark, or a

reference level that other governmental agencies might strive to achieve. The next section presents the maturity of Israeli authorities that hold planning and real estate information.

3   THE RICHNESS OF BARRIERS: DATA UNAVAILABILITY

Municipalities, the Ministry of the Interior and the Ministry of Finance (i.e. local and governmental authorities) are the main sources of planning and building information in Israel. The online availability of that information was examined in order to assess the technological feasibility of data aggregation. Online access to organizational databases is needed, under the appropriate restrictions, in order to pull the data automatically into geographical interfaces, mash-ups and dashboards, as described above.

3.1   Municipalities

Initial review has revealed different barriers to access data, if available at all, in the municipalities' websites. Previous studies (of the authors) showed vast differences between them. For example, large cities such as Haifa, Tel Aviv and Holon implemented IS for professional users, e.g. lawyers and architects. Each one of the pioneers offers different types of data, including maps, aerial photographs, forms, and other online services.

Small authorities (local councils) provided relatively more contact channels; while the leading council went even further and encouraged citizens to act against building plans in the area. The economic value of the information did not prevent the distribution of maps and photos; the mayor initiated an open debate and tried to engage public participation in planning. However, that was a unique case of a socially active politician, who also happened to be a technological specialist.

The local authorities – from large municipalities to the smaller local councils – should have access to documents that define the building rights of specific properties. When applying for a building permit, the documents that the citizen should request from the municipality are the deposited plan; the city zoning plan; and the information folder of the building permit. The information was not available on many municipal websites. In this work we examine the documents and data on the website of Tel Aviv, the largest metropolitan area, and the second largest city in Israel.

In the following sections the findings of a web survey, reviewing a set of crucial criteria of planning information, are presented. The criteria are: usability; data retrieval; data availability; concluding with proposed modifications.

3.1.1   Geographic information systems (GIS)

Usability: outdated system design (Figure 4); the user interface is not convenient compared to new GIS solutions; the map is reloaded slowly after the slightest change, e.g. in focus, and it lasts several seconds.

Data retrieval: the general impression is that the system was originally designed for the use of professionals rather than home users. Queries cannot filter information per location, or display requested data. Although the data exists, the current interface is limited to single sections and does not provide dynamic and faster access to specific addresses and locations in the city.

Data availability: the system stores dozens of layers of data that could provide extremely valuable information. For example, the section of Tourism and Leisure includes hotels, beaches, night life and entertainment. Varied aspects of life in the city are covered, from community centers to real estate data for professionals. Thus, although valuable data are stored in digital format, the system prevents online access. Examination of the software vendor discovered that the original system enables external interfaces, but we could not locate it in the city GIS.

The desired actions: allow queries; allow automatic retrieval with open software interface (Web application programming interface; Web API) and provide open data that enable open innovation

(application by external developers); integrate additional data from multiple sources; avoid unnecessary uploads; upgrade GIS and browser to improve usability.
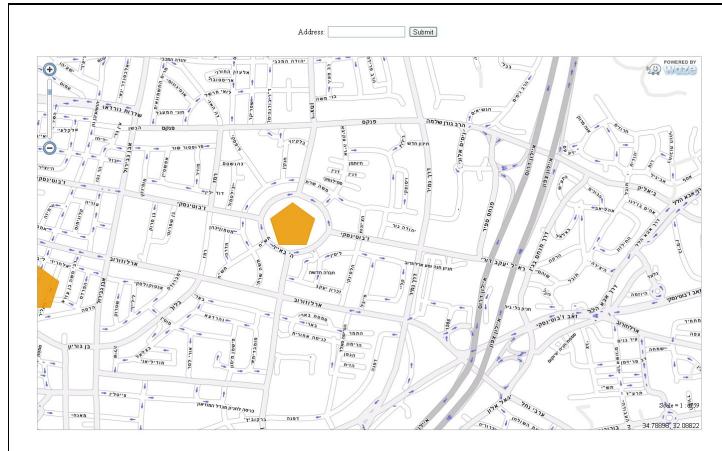

Figure 4. Tel Aviv GIS screenshot

3.1.2 Building rights: basic information

Usability: cumbersome navigation to the section. The convenient input is the address or the land parcel number (exact location of the property). The output is an html document that includes unorganized redundant data.

Data availability: the input must be entered manually, thus preventing the automatic retrieval to other websites (open innovation). The same goes for the html output.

The desired actions: design easy navigation to the page; design the output with meaningful fields, and provide a summary for the layman; Web API to allow automatic access to information from external applications.

3.1.3 Building rights: information folder

Usability: the printed documents of each property are archived in information folders. An cumbersome ordering process requires the following actions: download the form and related software; fill out the form using this software; save the form as an ASC file; send the file, and other documents if needed, as email attachments; expect an answer within a month.

The desired actions: design a complete online process; convert the documents into a database; provide online access to the database; Web API to enable automatic access to the database from external applications.

Instead of the expensive and inefficient process of scanning and uploading the documents as digital files, citizens that already obtain the documents could upload them, and fill online forms with the relevant data.

One example of effective crowdsourcing in complex projects is Galaxy Zoo. In the attempt to understand how galaxies are formed, NASA called the public to participate in classifying a million galaxies, imaged with Hubble Space Telescope, according to their shapes. Within 24 hours of launch, the site was receiving 70,000 classifications an hour and more than 50 million of them were received by the public during the first year, from almost 150,000 people. More than 250,000 people have taken part in Galaxy Zoo so far.

3.1.4   Minutes of the planning subcommittee

Usability: inconsistency in the protocols format between the subcommittees, e.g. some of the documents were converted from Word to PDF, others were printed, scanned and uploaded as PDFs; searching for addresses, decisions, or any other relevant information is almost impossible.

Automatic data retrieval turns out to be futile.

The desired actions: Web API to provide the automatic access of external applications. If the implementation of full web interface is not possible, consider the following options: (1) allow users and developers to download the entire database, and work offline, using the standard database tools; (2) define and use fields in Word files, e.g. an address field, the decision type, etc.; (3) use Excel files with columns of addresses, decisions etc. The proposed solutions are simple and easy to carry out.

A variety of technological barriers prevents the automatic retrieval of municipal data. Therefore data aggregation and visualization, as presented above, is impossible.

To summarize the municipality section it should be mentioned that during 2011 the municipality began planning an IS master plan. The plan was postponed due to financial concerns. However, as proposed, simple actions could create a considerable change in transparency and public participation.

One of the authors has attended all the committee meetings and concluded that, more than budget limitations or technological disadvantages, it is the organizational culture and working relations which force the barriers on change.

In the following section the findings of a web survey of national agencies' Internet websites are presented. Planning information of economic value was reviewed.

3.2   Ministry of Finance

The prices of real estate can be determined according to the actual price paid by the buyers for the property. The price of sale is reported to the Tax Authority at the State Revenue Administration, of the Ministry of Finance. After an ongoing refusal to disclose the actual real estate prices to the general public, the Tax Authority was legally forced to do that. However, although the data are now available online, the access to the database is limited. Software interface is not available, and the data are protected by a CAPTCHA (stands for Completely Automated Public Turing Test To Tell Computers and Humans Apart). According to Google's definition, a CAPTCHA is "a program that can generate and grade tests that humans can pass but current computer programs cannot. For example, humans can read distorted text […], but current computer programs can't" (www.google.com/recaptcha/captcha). Thus, not only that the agency avoids transparency, it implemented a program that reduces access to valuable public data.

In order to pull through the CAPTCHA without violating the law, the citizen has to choose the slow and ungainly manual harvesting, i.e. to fill the CAPTCHA and the land parcel number in every entry. Other ways to pull data automatically, either direct or indirect, are legally questioned: (1) static harvesting, i.e. harvesting the information in advance, through many sequencing retrievals, and with short breaks to prevent overloads (denial of service); (2) dynamic harvesting, i.e. access the database in real time, in response to specific queries, pull and process the data, and send off the output.

Illegal harvesting includes the following options: cracking the algorithm depends how strong the CAPTCHA software is; the CAPTCHA fields that should be manually filled are embedded on other websites, and the users, unaware of the deception beneath the surface, fill them (this technique is often used by gambling and porn sites).

While the Tax Authority limits data availability, but do not charge for the service, entrepreneurs have collected the data, built commercial usable websites, and charged fee. The high technological quality of the Tax Authority's system served to restrict access rather than encourage usage and re-use.

4 THEORETICAL IMPLICATIONS

Internet websites provide a glimpse into the organizations that formed them. Opened to the viewer's interpretations, the website may imply to what extent the organization is innovative, updated, communicative, influencing and so on. The reviewed websites manifest different values; while technological sophistication and ethical perspective guide the brave new world of open innovation, the governmental agencies do not provide access to the databases and/or maintain outdated websites. This technological and ethical gap is not hidden from the citizens.

In order to identify the conflicts that may arise from that gap, the technology-culture conflict model (Leidner & Kayworth, 2006) is introduced. Leidner & Kaywort (2006: 374) present three types of values: group member values ("beliefs about what is important to the particular group"); the values embedded in a specific IT ("assumed in the work behaviors that the IT is designated to enable"); and the general IT values (as "a group ascribes in general to IT").

As can be seen in Figure 5 each pair of values is likely to raise a conflict, and the model can be applied to the national, organizational, or subunit level.

Source: Leidner & Kayworth
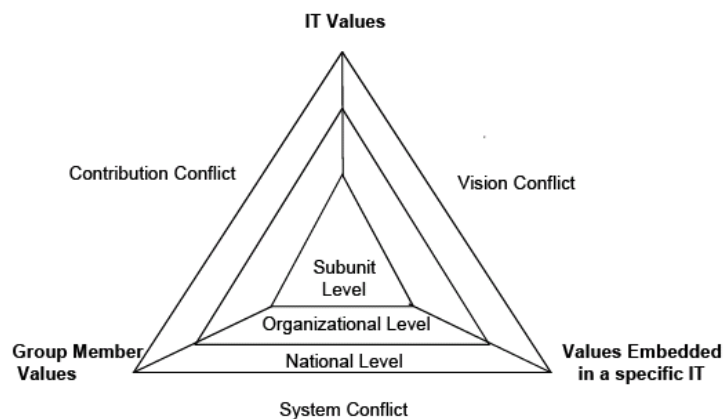(2010: 374),Figure 2.
A Tripartite View of
IT-Culture Conflict

Figure 5. The framework of Leidner & Kayworth's (2010: 374) model of technology-culture conflict

As shown up to this point, a broad gap appears between the public sector of the two cultures. The three dimensions are clearly demonstrated. The values embedded in a specific IT vary from openness, as was proven in the US Recovery Plan, to stagnation in local authorities and municipalities. The general IT values vary from the collaborative approach of open data and free platforms – to dissembling knowledge. From obstacles in using Web API to the restraints of CAPTCHA. Finally, the differences in group values are assumed based on evidence in the literature that will be framed in Leidner & Kaywort's (2006) theoretical model along with empirical findings.

4.1 Group member values

The affect of group member values (Leidner & Kayworth, 2006) was acclaimed by studies that looked into the impact of technology on the public sector, and vice versa. Various studies identify characteristics of individuals and groups in a way that could explain the current findings.

First, the notion of the social actor is adopted in order to frame the individual's action through the Internet. Next, the social action in the public sector is discussed.

From a theoretical point of view, ICT were recognized as "fundamental to the social construction and representation of reality and the self within organizational contexts" (Lamb & Kling, 2003: 217). In this manner individuals, either from within an organization or regardless of it, consistently affect and

are affected by their environment (e.g. their department, community of practice, others' ICT expertise, and so on). While identity characteristics and ICT competencies reflect and shape each other, the "collective social actor representations" arise. But, Lamb & Kling (2003: 217) stress, "even though they may present themselves as a coherent collective actor, people within an organizational unit aren't all alike because of the mix of affiliations, environments, and reciprocal interactions in which they engage over time".

When applying the theoretical rationale that was developed in the IS discipline regarding the impact of group member values, the unique context of the public sector should be emphasized. An important requirement in the design of almost any IS is the pragmatic concern to care about service quality, user satisfaction, usability etc. However, IS in the public sector are expected to utilize technology also for social justice.

The current website review emphasizes the inconceivable gap between the technological potential and the actual utilization. This matter has yet to be explained.

4.1.1 The public non-participating sector

Group member values that account for differences in technology adoption are studied in various disciplines. Public policy studies stress the challenges that managers face; to overcome organizational resistance while trying to figure out how to initiate a project on the organizational level. Recent Canadian study articulates the unique difficulties that officials share: "Due to their perceived "bureaucratic incompetence" and "resistance to change," public managers in particular are often blamed for poor policy formulation and weak implementation. Their motivations and commitments are also frequently questioned" (Howlett, 2011: 247).

Perhaps these are the barriers that the managers struggle with; frequent technological changes that require bureaucratic competence. Meier (2009: 7) names it "the missing variable" and proposes to examine the growth in the roles and responsibilities of managers in lower hierarchy levels. It seems that the increasing expectations and standards of service-oriented and citizen-oriented e-government intensify the stress that managers experience, especially when missing the demanded capabilities. A study in the public and the private sectors in Israel (n=809) showed that, especially in the public sector, emotional aspects provide the strongest explanation for performance levels. In situations of negative emotions the ability of the officials to act effectively decreases. The negative effect is much weaker in the private sector (Vigoda-Gadot & Meisler, 2010).

Back to our research findings, it should be noted that the difficulties, as described in the literature, were evident throughout the municipality's discussions of the technological master plan (i.e. the municipal steering committee that was documented as part of this study). Resistance to change was spelled out by senior workers that were interviewed by consultants; while the managers faced the bureaucratic challenge – how to plan the organizational structure of the project.

On the other hand, innovations in the public sector, and the ongoing adaptation to the technological and social changes, do exist in many countries.

4.1.2 The public e-participating sector

Participative planning (Land, 1978), positive design (Avital, Boland & Lyytinen, 2009), and IS design in general emphasize the importance of communication with the users. Thus, social awareness is embedded in the life cycle of system development. The managers that do set standards, fulfil expectations, and are intrinsically motivated to make a change, are presumed to possess broader values. This is to say that the ethical aspects should be studied together with the professional ones (e.g. business model, incentives etc.). The closeness of the ethical perspective and the pragmatic convention is assumed to explain the success or the prevalent failures to identify customers' needs. "This should not come as a surprise", claims Noveck (2009: 15), accusing policymakers for avoiding the powerful tools to connect people.

An Australian taskforce (2009: 6) proposed guidelines towards government 2.0, which can be adopted almost as is to the local scene revealed above. The taskforce pointed towards the public sector on one hand and the public engagement on the other.

On the public sector:

- How can we build a culture within a government that will favour the disclosure of public sector information?

- What government information should be more freely available and what use can be made of it?

On public engagement:

- What are the major obstacles to fostering a culture of engagement within a government and how can they be tackled?

- How can a government capture the imagination of citizens in a way that will encourage their involvement in policy development?

The growth of interactive relationships and collaborations with governments is indeed a cultural development that cannot be ignored.

5 SUMMARY

The integration of real estate data from multiple sources could create new valuable information to the benefit of society. Innovative websites that visualize open governmental data are described in this paper in order to demonstrate the potential economic, social, and environmental value of the integrated information. The collaborative systems provide automatic access to data and increase the richness of geographical interfaces, mash-ups and dashboards.

A geographical-interfaced IS was developed in order to prove the technological feasibility of a collaborative system in Israel. Nevertheless, data were not available. Examination has detected a variety of barriers to planning data stemming from different sources. In addition to impairments such as inconsistent formats and lack of usability standards, access has also been intentionally prevented by the implementation of applications that block the access of automated software (CAPTCHA; tests that humans can pass but computer programs cannot). The strict limits that the public sector sets on the collection and use of data leave the public with the option to produce it. Open innovation and crowdsourcing are suitable methods for the aggregation of data by citizens. Therefore, instead of public participation in governmental initiatives, public engagement is needed for the initiation of a civilian action.

In order to explain the disparities of openness levels in the public sectors, the findings are framed in a theoretical model of technology-culture conflict (Leidner & Kayworth, 2006).

6 CONCLUSIONS

The theoretical contribution of the paper is in exemplifying the impact of ethical maladaptation to technology. Even if the group members are fully engaged in IT improvement, their values prevent them from adopting, planning, implementing and managing IT in a way that utilizes it. The adaptation to values is emphasized.

Cultural fit, a concept that has emerged in the IS-culture literature, determines IT perceptions and behaviors. The lack of fit between the group's values and "values embedded in a given system" (Leidner & Kayworth, 2006: 373) is a possible explanation for the maladaptation to the online environment. And vice versa, if managers in the public sector strive to utilize technology for social action, they will adopt and be adapted to online applications that enable online communication and knowledge creation.

Some gaps in the existing literature are addressed in this study: (1) The IS-culture literature has only considered "specific IS applications and has not considered the more general IT culture" (Leidner & Kayworth, 2006: 373). This study deals with collaborative e-government in general, in different democracies. The multi-layered systems that pull data from multiple sources are studied not as a specific IS, but as the representation of the relationship between social activists and governmental databases; (2) Another gap in the IS-culture literature, according to Leidner & Kayworth (2006: 373), is this: "Little has been done to better elucidate the types of IT values that may exist and how they might influence IT use choices". In this study two contrasting IT-cultures are presented: the culture that uses IT for collaboration, e.g. open databases and Web API, and the culture that uses IT to block information, e.g. prevent automatic access with the designated software; (3) The cultures differ also in their professional IT level, and the effective utilization of technology in general. This disparity might represent the conflict that exists in the closed IT-culture between the organizational values and the IT values. Change in the organizational culture would solve the conflict and allow online systems to connect with external software and users.

Further research is needed in order to show how values shape managerial decisions, and are embedded in IS design. Further research is also needed to address data quality issues: how to integrate real estate information from various sources so that new value emerges; what is the technological feasibility of the system – under local constraints; what is the organizational feasibility of removing the barriers to information, providing access to data, and increasing transparency and public participation in planning, with the use of technology.

Group member values should be studied on the organizational level, in municipalities and governmental agencies in Israel. What prevents citizen-oriented e-government? Perhaps these are self-interested officials; employees concerned about loosing their job; internal politics and power conflicts; the absence of technological skills, budget, awareness, etc.

It should be mentioned that the citizens, on the national level, are group members who support openness, just as social activists would be. Therefore the public sector's resistance to change could be confronted by collaborative systems that the citizens create.

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