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**The USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTs)
AS TOOLS FOR INSTITUTIONAL TRANSFORMATION IN ARMENIA**

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Abstract

This paper consists of an analysis of the role of information and communication technology in government in Armenia. This examination is based on broad theoretical research, as well as on qualitative information gathered over a six-month period of interviewing key IT government employees, as well as of individuals working within and on the periphery of Armenia's burgeoning technology sector. The purpose of this research is to formulate a means by which the feasibility of e-government can be assessed, not only in terms of deploying its physical infrastructure, but also in terms of looking at its relevance given the current political climate and the nature of the democratization process in the country. Main topics addressed in this paper will include an examination of the role of technology as an institutional "transformer" - given the intangible constraints of a Soviet legacy, the problems inherent to the use of IT in a donor-based economy, as well as the challenges of facing the status quo of administrative infrastructure in Armenia.

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“The dream that a new technology might liberate man from both the tyranny of nature and the fruits of his own folly is as old as Western civilization.”¹

Introduction

As a landlocked country isolated in many ways from the global economy, and lack in a substantive industrial base, Armenia stands to gain tremendously from the use of information technology. The country is still adapting and recovering from major events of the last fifteen years, and many efforts are underway to uncover the right configuration of aid, technology, and policy that will be conducive to sustainable development. In a well-known “Armenia 2020” May 2003 strategy paper written by McKinsey & Co., a number of recommendations were formulated based on an assessment of the software and IT services sector in Armenia, as well as upon a range of success factors from various case studies, including from India, Israel and Ireland. One of those key recommendations was focused on the role of government as a leader in fulfilling ‘information society’ objectives, mainly as a lead user and facilitator of IT services in the public sector.

The advancement of Information Technology (IT) in Armenia is touted as one among a handful of solutions able to address the development ills of the country. Various organizations have been conceived to facilitate both public and private sector IT advancement in Armenia, including the formation of an IT Development Support Council, an Enterprise Incubator Foundation, the formation of SiliconArmenia.com, among a number of improvements to the educational curricula in technical fields of the state universities. A number of e-government initiatives have emerged from across the spectrum of donors that operate in the country – TACIS, USAID, CDA, DFID, etc. – as well as in varying degrees from the NGO community.

The extent to which these efforts effectively contribute to the transformation of the institutions of governance in Armenia is not something to be taken for granted. This paper will consist of an analysis of the current use of information and communication technology (ICT) in one of the principle ministries of the executive branch of the Armenian Government: the Ministry of Health. This will be used as an example, a sampling of analysis that comprises a larger comparative study that is currently underway of all major institutions in the three branches of Government.

The paper will be grounded in the theoretical foundations of the concepts of political development and political culture, tying in the manifestations of institutional development in Armenia to its broader socio-political context. This examination is based on pieces of qualitative information gathered over a six-month period of methodical interviewing of key IT government employees, as well as of individuals working both within and on the periphery of Armenia’s burgeoning technology sector. The purpose of this data gathering is to formulate a means by which the feasibility of e-government efforts can be assessed, not only in terms of deploying its physical infrastructure, but also in terms of looking at its relevance given the current political climate in the country.

¹ Westin, Alan F., Ed., 1971, “Information Technology in a Democracy”, Harvard University Press, Cambridge, Massachusetts, 1.

Due to space constraints, this paper will not go into great detail for each ministry or government institution; rather it will take a broad overview of Armenia's ICT capacity.

Topics addressed in this paper will include an examination of the role of technology as an institutional "transformer" - given the intangible constraints of a Soviet legacy, the problems inherent to the use of IT in a donor-based economy, as well as the challenges of facing the status quo of administrative infrastructure in Armenia. Armenia's current administrative infrastructure is indeed a critical barrier - along with its dire telecommunications (i.e., ARMENTEL) predicament- to the facilitation of enhanced levels of political participation, and to political development. Is IT a possible partial solution to the endemic problems of governance in Armenia? This question - among other related queries - will be addressed in this research.

This analysis is comprised of two general facets of technology utilization with government institutions. One is based on the organic growth and usage of technology internally (i.e., technology as endoskeleton), including the existence of information systems, servers and networks - as well as databases and applications. The other refers to the external usage of technology (i.e., technology as exoskeleton), as public diplomacy and public relations tool - as the primary means by which a given institution projects information about itself to its citizenry and peers in government. The most superficial manifestation of this type of ICT is the internet site, while the deepest measure of technology commitment in such organization is the existence of an explicitly designated IT budget, staff, and developed institutional capacity.

Theoretical Foundations of Technology Impact in Political Systems

Understanding the dynamic of non-western polities requires an approach that transcends falsely intuitive analytical frameworks based on western experience alone. It also requires a capacity to account for traits and trends that are embedded deeply within specific cultural and historical contexts. Accordingly, the view of technology as a neutral force in a polity is not unquestioned; cultural and historical context can play a role in polarizing its effects. Langdon Winner (1986), for one, was not satisfied with the view of neutrality, arguing that technology can be inherently political. Winner (1986) asserts that this is true in part because there are some technologies that are particularly linked to a particular social or political system.²

² Winner, Langdon, 1986, *The Whale and the Reactor: A Search for Limits in an Age of High Technology*. The University of Chicago Press. A technology like a nuclear power plant, with the high risk involved in plant failure leading to a highly centralized method of producing power and the need for security to protect from theft and sabotage, is an inherently authoritarian technology. This does not mean that a nuclear power plant cannot work in a democracy, just that it concentrates power in a few. Similarly, the distributed, interlinked nature of the electrical distribution system is far more democratic in nature. The other way in which technology can be political is in its creation. Langdon believes that "[m]ost changes in the content of everyday life brought on by technology can be recognized as versions of earlier patterns." There are, however, technologies that are fundamentally new and affect broader patterns".

Before embarking on a study of ICT capacity of institutions in a political system, it is important to focus on a few conceptual areas that govern and affect the role of new technologies in government. These include the relationship of technology to power in political systems, the process of political development, and the phenomena of political culture. Each of these gives us a sense of how and what technology can accomplish and affect in society: “[Through the use of ICTs]... information about social reality could ... be made so rich and detailed, policy options could be so clearly defined, the probable outcomes of alternative measures could be so accurately predicted, and the feedback mechanisms from society would be so effective that man could at last bring his full intelligence to bear on resolving the central problems of society.”³

Power in Political Systems

Insofar as the question of the concentration of blatant political power is concerned, the region of the Caucasus (and Armenia, in particular) faces challenges ranging from an overall deficit of democracy and the predominance of ‘strongmen over statesmen’,⁴ to the dysfunctions wrought by small clan-based ruling elites functioning in a dominant executive, a weak parliament, and a dependent judiciary.

Rosenau and Singh (2002) study traditional notions of instrumental, structural and meta power in political systems, and IT for them is a key enabler for formerly disadvantaged groups to play a role in politics, and reconstitute their identities. Instrumental power focuses on the capacity or capability of power holders to effect particular outcomes. Thus ICTs are viewed as a force that enhances these capabilities. This was one of the first ways in which political scientists and policy makers examined the relationship between IT and power in politics. ICTs enhance the capabilities of traditional global actors like states and firms, while also empowering other actors (like transnational social movements or terrorist groups).⁵ Early writings of the impact of technology on power in public policy literature have revolved around notions of instrumental power. The way technologies empower less privileged groups is especially important in recognizing the promise of technology in instrumental contexts. The spread of democracy in Russia, as Rosenau points out, was in crucial ways tied to the proliferation of information networks and accessibility of information for individuals and groups.

Structural power, on the other hand, deals with capabilities in a political system - and on the ability to affect the rules and institutions that govern outcomes. By definition, structural power is concerned with the constraints and limitations of particular activities with given institutions. The reciprocal relationship between technology and structure is noted in a number of ways by Rosenau and Singh (2002). First, technology influences the structures of security or economic affairs; moreover, existing structures or institutions

³ Westin, Alan F., 1.

⁴ Giragosian, Richard, 2003 (April 10-12), “Problems of Governance: the Caucasus”, Center for Slavic, Eurasian and East European Studies, in Conference about Contemporary Security Challenges in Eurasia: Chapel Hill, North Carolina.

⁵ Rosenau, James N, and Singh, J.P., 2002, Information technologies and Global Politics: The Changing Scope of Power and Governance, Albany, NY: State University of New York Press, 7.

shape the technologies themselves. The case of technology shaping structures is made foremost in radical scholarship; those of the Marxian strain posit that so-called ‘forces of production’ (including technology) are essential in the unfolding of history, shaping social relations (as between capitalists and workers). The dialectical relationship is held in place by the superstructure, including the state that ‘exists to guarantee the production of these social (including economic) relations as a whole’. Following in these footsteps, Winner (1977) believes that technologies are structures whose conditions demand the restructuring of their environments.

A slightly different notion of structural power comes from those who see existing structures as constraining the use of information technology. Structure determines what technology can or cannot do, instead of vice versa. Rosenau believes this – that technology is neutral but that its use is shaped by the environment in which it finds itself. There are indeed contexts in which technology and structures, or political-economic institutions, adapt to each other.

The last concept of meta-power refers to how networks reconfigure, constitute, or reconstitute identities, interests and institutions. Keohane and Nye (1988) point out the ascendance of soft power - and thus come close to delineating a notion of meta power. They see the power of persuasion (rather than force) as a new salient feature of politics when information networks proliferate; this area is particularly salient for those in the business of public diplomacy, which is essentially the realm of public relations in government. Some theorists see technology as merely playing a catalytic role in accelerating or reinforcing existent or developing processes. Thus, the emergence of government websites, for example, can serve to merely reinforce the relevance or legitimacy of institutions that are intent on conveying a particular image to a particular audience; the element of control implicit in the application of technology to the process of content development means that institutions can “be” what they say they are.

According to Rosenau (2002), power is ultimately about capabilities, identities, and interests. Governance involves authority, concerted action and the resultant institutions, and ICT networks themselves are governance networks. They allow for diffused forms of authority to emerge, for concerted action to take place, and for institutional creation or reinforcement. IT is deemed, in scholarship and popular opinion, to make governance less hierarchical and more plural and democratic. And yet, it is critical to avoid making assumptions of this sort that can allow for a deterministic ICT paradigm to supercede the reality of partaking in technology projects in transition countries.

Political development

According to Almond and Powell (1966), the study of political systems necessitates analysis of the capabilities and functions of institutions within. In broad terms, political systems can be assessed in terms of the relationship between functions and structures, and in many ways it is technology that determines the interface between these. Certainly, the way ICTs are used in the political sphere affects the way government institutions convey information about their objectives and purpose, and how they make themselves accessible

and interactive as part of a feedback loop with their constituents. Thus, the relationship between structure and function in government institutions is a critical one.

The term ‘political development’ is endowed with a particularly deterministic undertone in the post-communist/development context. This is not unlike the majority of ICT projects undertaken in the developing world; the expectations of technology as an objectively positive transformer of institutions are clear. To develop, particularly in conjunction with the deployment of IT, means to create and simulate the structures and appearance of neo-liberal institutions as they exist in the West. Needless to say, this is a highly interactive, dynamic and complex process in which outcomes are not certain.

Political development is a byproduct of the extent to which the international community permeates the institutions of a country, the way domestic society evolves alongside civil society, and of course the way political elites pursue and fulfill their interests. As a process, it has some critical catalysts: impulses for change in the magnitude (and content) of inputs (i.e., challenges, requests for information) into a political system. Such impulses can emerge, theoretically speaking, as a result of a growing lack of capacity in a system to cope with confrontation to incumbent powers. It should also be pointed out that a decline in the magnitude or content of the flow of inputs into a political system may result in ‘development’ in a negative or regressive sense. The capabilities of a political system may decline or be overloaded, roles and structures may atrophy, and the culture in question may regress to a more traditional pattern of orientation. Many would agree that the lack of transparency and clarity in political organizations and the increasing entrenchment of private interests in the Armenian public sector reflect just this type of regression. Moreover, when ICT projects are implemented on top of a flawed institutional status quo (where an elite has been modernized but a vast majority is marginalized), outcomes can be less than optimal. This is a finding that is confirmed by the case of Armenia.

Almond and Powell (1966) identify several types of challenges or problems to a political system; one of these is the problem of penetration and integration associated with state-building, the second is that of loyalty and commitment (possibly manifested by the extent of general trust in government), the third is that of participation in government decision-making, and the fourth is the problem of distribution of income, wealth and opportunity.⁶ All of these problems feature prominently in Armenia’s political system, and in some ways ICTs are being used as a superficial balm to soothe some of these problematic areas. The proliferation of internet sites, online communities, and the objectives of portal creation are in large part aimed at addressing issues of political participation and political trust.

A common theme in the democratizing ‘transition’ states of the former Soviet Union (with the exception of Georgia, in which there has been significant U.S. involvement) is that such outright challenges are relatively latent, although unrest is high and general standards of living are still low. In Armenia, they surfaced briefly for a time in spring

⁶ Almond, Gabriel and Powell, G. Bingham, 1966, *Comparative Politics: A Developmental Approach* (Boston; Little, Brown), 35.

2004 before being brutally repressed, without allowing time enough for there to be ripple effects in the fabric of governmental institutions. Formal opposition yet exists, but the more dangerous informal opposition forces characterized by people demonstrating in the streets is gone – replaced now with general apathy of the citizenry, mingled with mistrust and fear.⁷ The neo-nomenklatura working in government institutions are very concerned about conveying a particular image about the state of affairs in Armenia; there is a concerted, collective effort to portray a cosmetically (i.e. technologically) enhanced version of government and state. In most cases, this is merely to ensure that donor funding streams continue to flow – in what is without question a donor-driven economy.

Political Culture

In conjunction to delving into the meaning and process of political development, it is essential to examine the concept of political culture. According to Almond and Powell (1966), it is the pattern of individual attitudes and orientations toward politics among the members of a political system; the subjective realm that underlies and gives meaning to political action.⁸ Such orientations can be categorized into a few categories, including cognitive, affective and evaluative; each of these is based on varying levels of individuals' understanding, knowledge, feelings or judgment of political objects and events. Naturally, as a political system is made up of the sum of its parts, and as institutions are comprised of the individuals that work within them, these perceptions associated with political culture matter. Political culture is likely to support certain general political goals and procedures, and to reject others.⁹ To a large extent, the supply and demand of political trust in society is also a determinant of its political culture: are political opponents viewed with suspicion? Does political interaction and discussion take place, what is the level of civility and institutionalization of political interaction?

Armenia's formal political culture is characterized by a President that holds enormous power (despite lack of specific reference thereof in the Constitution), a Prime Minister that has no specific mechanism of recourse upon presidential decisions, a redundancy of responsibilities, as well as a lack of accountability and 'checks' between branches.¹⁰ Its informal political culture, exemplified by its nepotistic tendencies, its non-standardized work habits, its general disregard for transparency and the free flow of public information, as well as a paradoxical conduciveness to the emergence of individual innovators within its structures, is something more difficult to gauge without the experience of immersion.

⁷ A poll conducted in the summer of 2002 revealed that less than 15% of the population read (government-controlled) newspapers on a daily basis and reported that 48% did not read newspapers at all. A September 2002 survey that found a mere 1.5% of the Armenian population trust the country's print media, compared with 80% five-six years ago. Giragosian, Richard, Balci, Tania M., 2003, "Report on the Status of Economic and Political Transformation: The Republic of Armenia (1998–2002)" (Draft). The Bertelsmann Foundation, 9.

⁸ Almond & Powell, 50.

⁹ Ibid, 57.

¹⁰ Mkrтчian, Nerses, 2001, "The Governance System in Armenia". United Nations Development Program, Link: <http://www.forum.am/groups/pol/mat/29.doc> (accessed December 16, 2004), 2.

The Concepts of E-Government & Bureaucracy

Approaches to the implementation of e-Government work in developing countries generally tend to be broad and top-down. While a top-down approach in a transitioning country is very necessary in terms of guiding strategy and political will, it is not as useful when one gets to the nuts and bolts of looking at how e-Government can actually be realized. Most of the work in this sphere being done is undertaken by donor organizations, and little of it in Armenia tends to be part of any organic movement toward ICT/automation. Website content developers are not working with process engineers and Chiefs of Staff to determine how best to limit the average citizen's time spent on countless administrative merry-go-rounds. Yet, simply put - websites can be built, citizens can use those websites, processes can be automated, technology can work its magic and a country will be more democratic because of it. Of course, as soon as one comes to reality, one sees that the internet penetration, teledensity and general proclivity of the population to seek public information is nowhere near where it must be to justify E-Government initiatives.

The idea that ICTs could be used to increase and enhance direct democracy (Barber, 1984) is an overly simplistic one when put into the context of non-western, transitioning political systems. As it is, the definition of e-government as brought up through the interview process for this research yielded absolutely no uniformity or clear understanding of the term. E-Government, for the purposes of this research, is defined as the use of information and communication technologies to provide access to government information and delivery of public services to constituents through the automation of bureaucracy.

According to Jane Fountain (2001) of Harvard University, "... information technologies and organizational/institutional arrangements are connected reciprocally. Both function in this framework as dependent and independent variables. Each one has causal effects on the other. Institutions and organizations shape the enactment of information technology. Technology, in turn, may reshape organizations and institutions to better conform to its logic. In contrast, institutions generate rules and requirements to which actors and organizations must conform if they are to receive support and be deemed legitimate in their authorizing environment. Organizational environments reward effectiveness, efficiency, and control over production. Institutional environments reward normative requirements for appropriateness and legitimacy and, in some cases, conformity to procedure, presentation, symbols, and rhetoric."¹¹

According to Weber's theory of bureaucracy, a new type of organization, leadership and bureaucracy was derived from a 'rational' framework in the second half of the 19th century. Leaders in these systems are recognized and obeyed for subscribing to values

¹¹ Fountain, Jane, 2001, Building the Virtual State: Information Technology and Institutional Change, Brookings Institutions Press.

of logic, efficiency and reason; such organizations functioned on the basis of legitimately derived laws, rules and regulations.¹²

Weber identified three key features of bureaucratic organizations: a formal and unambiguous hierarchical structure of power and authority, an elaborate, rationally derived and systematic division of labor, and a set of general, formal, explicit, exhaustive and largely stable rules that were impersonally applied in decision-making.¹³ All decisions and communications are recorded in permanent files, there is a clear separation of personal from official property, and a high level of meritocracy (as opposed to nepotism) applied to hiring personnel. Despite the clearly negative connotation of this terminology when used in present day, it is apparent that the characteristics attributed to it as a concept are desirable. For those familiar with Armenia's political system, it is clear that the structures in place are pre-bureaucratic and in the laden context of a traditional society.

It is difficult for a specialized bureaucracy to operate effectively in a traditional society.¹⁴ In such societies, the conduct of politics is governed by custom, and more specifically by the patterns of behavior engrained in well-established social networks. Individuals are treated (and behave) according to ascribed status, not according to particular merits and needs relevant to a special political domain. If the rules of Weberian bureaucracy as we know them are imposed on such cultures, they are soon undermined by the persisting traditional norms. Hence the idea that even if ICTs were being used to enhance the functionality (and hence interactivity) of websites, the fact remains that citizens seeking information about how best to accomplish a public sector administrative task will not send email or check an internet site. They will call someone they know 'on the inside', if they can, to find the most effective and expeditious way to accomplish their goal.

According to Aby Jain (2004), two prevailing themes emerge through these kinds of exercises: the first is that IT emerges as a tool for reforming bureaucracy, and the second is that e-Government failure may be explained as a consequence of bureaucracy. The issue of how e-government and bureaucracy impact one another is undetermined and lacking in clarity. Various researchers like Schol, Bardach and Lazer have used various lenses to study e-government – stakeholder approaches, network theory and diffusion of innovations phenomena as a means of understanding under what conditions ICTs can improve the functioning of government.¹⁵ The case of Armenia will serve as a means by which the validity of both of these emergent themes can be examined.

Introducing an Assessment Tool

For the purposes of this analysis, the process of political development or maturation in Armenia's political system as a function of technology usage is contingent upon a core

¹² Jain, Aby, 2004, Using the lens of Max Weber's Theory of Bureaucracy to examine E-Government Research, Proceedings of the 37th Hawaii International Conference on System Sciences, 2.

¹³ Ibid, 2.

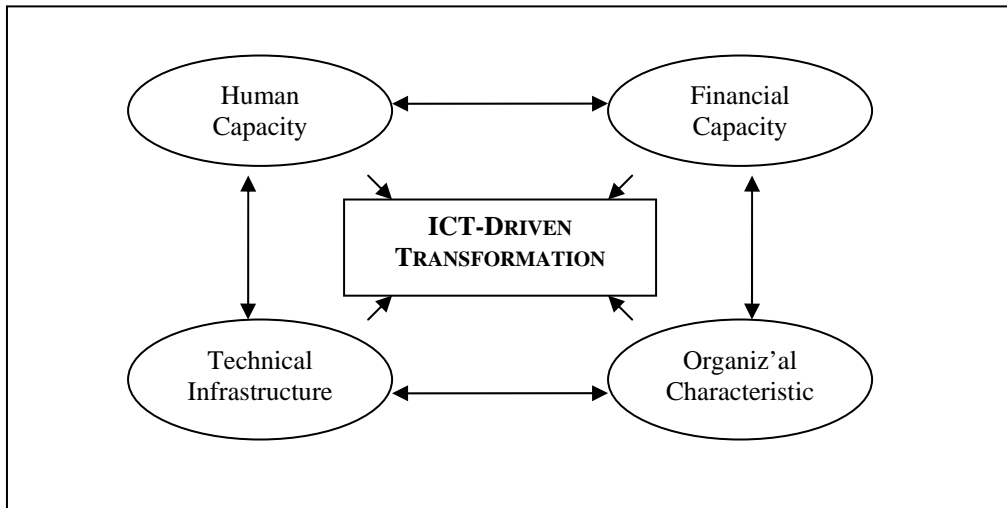
¹⁴ Almond & Powell, 59.

¹⁵ Jain, 1.

set of institutional characteristics. These include human capacity, organizational culture, technical infrastructure, and financial resource base. These four components shown in Figure 1 comprise the structural and cultural characteristics existent in a country’s political system. Each of these pillars of institutional ‘capacity’ are an effective indicator of the extent to which ICTs can be applied and absorbed to achieve the ‘official’ donor objectives of greater efficiency and transparency. Without them, it is not possible to gauge any change in the “regulative, distributive, symbolic or responsive capabilities”¹⁶ of Armenia’s political system.

The tools used to manage information flow in a public sector institution, particularly related to the executive branch of government, has a material impact on the ability of that institution to articulate its objectives and to eventually meet them. Since the key role of public sector institutions can be seen as (at least theoretically) relegated to the sphere of public service, it is particularly critical to observe whether or not the utilization of technology is able to fulfill this goal. The likelihood and potential of an institution to absorb new information technologies such that they can be real enablers of change is contingent upon several interwoven key components related to organization, infrastructure, and leadership. Some are structural, while others are more dynamic and apt to be in flux, including budgetary and human resource issues.

Figure 1: The 4 Pillars of ICT Driven Institutional Transformation



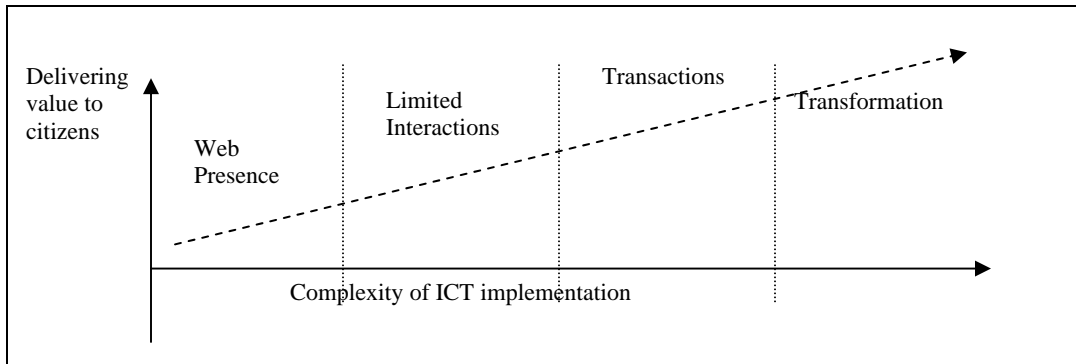
The main query areas of this type of assessment are designed to address each fundamental component in turn, related to a government organization’s capacity to adopt and use ICTs. These are based on a set of assumptions about what it means to use IT effectively in an institution, insofar as the characteristics of technology as an objective, positive transformer can be understood. For example, it would be a valuable outcome if the determination of one component of ICT development turns out to be a catalytic one for the other components. In other words, it is a goal of this type of research to figure

¹⁶ Almond & Powell, pg. 38.

out whether the main barrier to successful ICT implementation is a financial one, as opposed to a technical one.

Based on a summary review of ICT for development projects, it is evident that the invisible threads of determinism wrapped around the various technology-related aid programs that donors organize are real. While donor efforts to promote democracy and free market values in transitioning countries are noble and largely well-intentioned, the approach based on ‘cause-and-effect’ expectations about IT is a flawed one. Indeed, there is a degree of latent determinism even in the terminology and stated missions of those involved in gifting computers, networks and servers to the developing world. In conjunction with this, of course, is a normative component that derives from academic literature characterizing ICTs as inherently positive social transformers. Part of this is reconfirmed by the adapted conceptualization of the process of implementing ICT work as a function of the value delivered to citizens, shown in Figure 2. This was part of a presentation of the World Bank in Armenia to a group of IT and e-Government experts in October 2004. From web presence, to the facilitation of interactions, to the eventual transformation of institutions to an ‘ideal’ (exemplified by optimal levels of political participation), ICTs are considered as tools for facilitating ‘progress’ along a continuum of institutional change.

Figure 2: ICT and Service Delivery



As ICT implementation progresses, the utility of the technology to the citizenry is gauged as a function of the complexity of the types of transactions it facilitates. This analysis attempts to clarify the features that will render the deployment of a technology program either a success or failure in these terms. Due to the fundamentally qualitative and subjective nature of this analysis, it is important to start out with a basic understanding of the interplay of decisive factors in a conceptual framework, as well as to articulate the means by which optimal and sub-optimal outcomes can be assessed. Figure 3 lays out some basic scenarios to this end.

Figure 3: Characteristics of ICT Scenarios

	Sub-optimal	Optimal
Human Capacity	Late Adopter Culture	Innovator Culture

Technical Infrastructure	Donor Driven & Marginal	Organic Growth & Mission Critical
Financial Capacity	Deference to External “Push” factors/ Aid	Commitment/ Active Resource Allocation
Organizational Characteristics	Opaque, No Feedback Mechanism	Commitment/ Transparent & Accountable

Sample Case: ICT Status of the Ministry of Health

Address: Government Building 3, Republic Square, Yerevan, Tel.58-24-13

Website: <http://www.arminhealth.am>

Number of Employees: Approximately 100-120

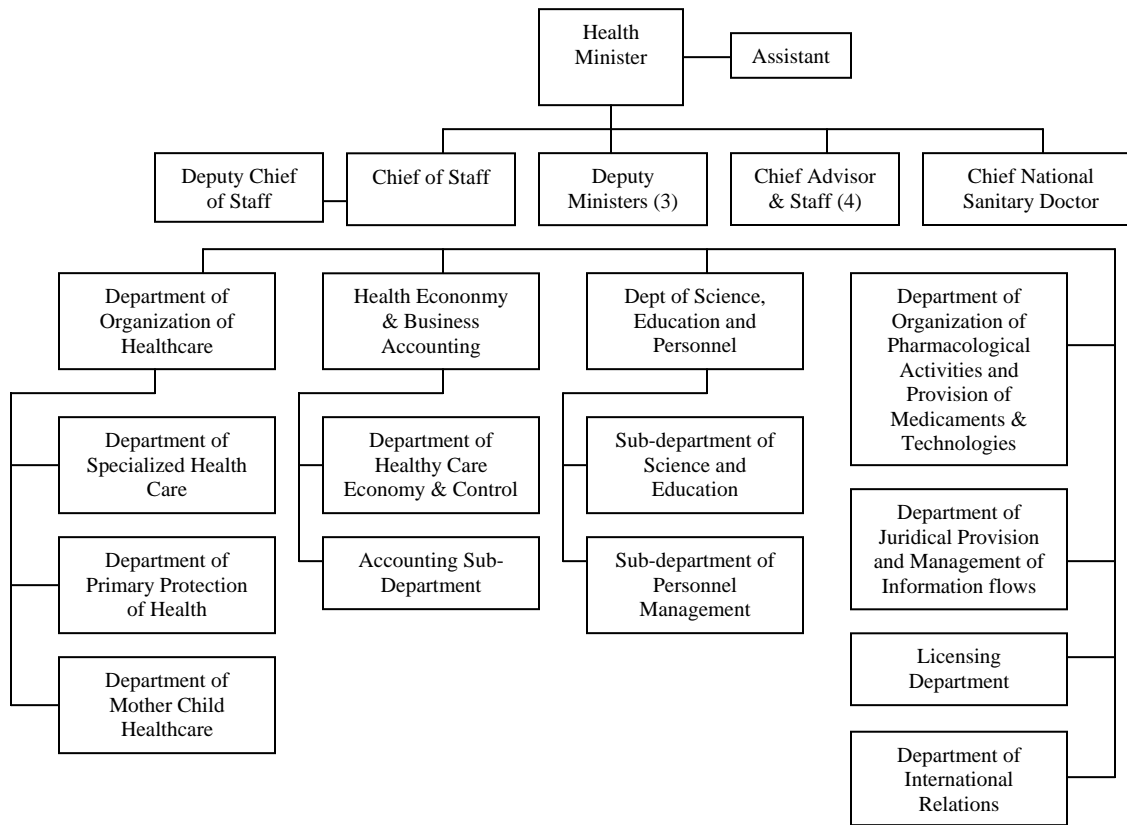
Percentage of Computer Usage: 75%- 80%

According to its official description, the Republic of Armenia Ministry of Healthcare is a republican body of executive authority, which elaborates and implements the policies of the Republic of Armenia Government in the healthcare sector.

Publicly available information includes statistics through a ‘National Database’ (including population, characteristics of population health, resources for health care, maternal and child health); legal Information (Law on Drugs, Law on Reproductive Health and Rights); programs and Action Plans (National Environmental Health Action Plan of Armenia (NEHAP), including a program on tuberculosis/malaria control in Armenia; the Armenian-American ophthalmology program; family medicine in the Primary Health Care; National Response to HIV/AIDS in Armenia; programs and strategies to improve child health and development; and programs and strategies to improve reproductive health).

There is also information available on International Cooperation Programs, as well as key features including webmail capabilities, and English/Armenian language options. This Ministry’s website, relative to others sites, has been developed with the help and collaboration of the World Health Organization in Geneva, Switzerland.

Figure 4: Organizational Structure of Ministry of Health



In each department of the Ministry of Health, on average, one finds a Head of Department, a Deputy Head of Department and/or various Heads of Sub-Departments, a Chief Specialist, a Leading Specialist and/or a Primary Specialist, and a Secretary. The Licensing Department, the International Relations Department, the Department of Juridical Provision and Management, and the Department of Organization of Pharmacological Activities and Provision of Medicaments and Technologies are smaller than their counterparts in the organizational structure of the Ministry.

There are three main layers to the *Health Information System Assessment*, including the associated ministries (Ministry of Health/National Statistical Service/Ministry of Social Welfare), municipal centers, and medical facilities in the regions. Although it is not immediately explicit on the organizational chart of the Ministry, an Information Department exists (as part of the Judicial Provision and Management of Information Flows Department) and was created approximately 2 years ago, having been previously split into three separate information/technology-related centers. The Minister of Health decided to centralize the work of the ministry’s information and communication infrastructure in 2001, and work with the World Health Organization on an “ICT implementation” project.

As a result, the Ministry of Health has a moderately advanced information and communication technology infrastructure, supported in part by their own servers (mail,

file), and in part by the services of MedInfo a private health information systems provider created in 2001 working primarily with the Ministry of Health. Part of the result of this project is the ministry website, which by Armenian ministry standards, is well developed and navigable.

MedInfo works with the Hygiene Agency, and on the SANIBIT database, which is an information bank housing 87 types of disease indicators. Their work is devoted to health related data processing, system design, and the provision of support to the technical projects of the Health Ministry and related units. Prior to the creation of MedInfo, there was a Health Information Analytical Center in existence from 1996-2001; service was generally incompetent and the lack of adequate financial resources to maintain the department internally rendered it ineffective. After 2001, work toward a functioning social security system began, along with development of the NEMRUT system, and the National Information System (under the auspices of the Ministry of Transport and Communication), among others. Since the ‘privatization’ of the Information Analytical Center one year ago into MedInfo, IT service has improved in quality, and appears to be more answerable and responsive to Ministry technology needs.

The primary challenge of the ICT environment in the Ministry of Health appears to be one related to facilities, and education/IT training. The last major training occurred approximately three years ago, and there are still issues surrounding the fact that some of the reporting forms they use to collect information date back to the former Soviet system. There is considerable duplication of effort in the procedures associated with reporting/recording data. Attempting to interact with comparable institutions – for the purpose of leveraging information or looking at benchmarks/best practices – is problematic for this Ministry.

The problem of norms surrounding the provision of information to the citizenry is a serious one, in large part because the key target audience of the Ministry is the people. Citizens, when they contact this ministry, must write official letters; emails are not part of the communication norms of this institution. ICT infrastructure, from an organizational perspective, is seen as an enabler not necessarily for standardizing the presentation of public information (an area in which they have already made some organic progress), but as an opportunity for comparing national data with international data sets. ICTs are seen to facilitate collaboration and to prevent the duplication of effort.

Human Component

There are between 100 and 120 employees in the Ministry of Health, of whom 80% have PCs. A total of seven people work for the in-house Information division under Director Elvira Mirzoyan, which is dedicated to the collection and analysis of data; two technical workers who focus on network maintenance/systems) are imported from Medinfo, and there are an additional three statisticians who work on reports and methodology. The Ministry itself does not employ the real technical specialists necessary for system design. While the work of MedInfo is indispensable to the functionality of the Ministry, the use of new technologies appears to be moderately “mission-critical” to its operations.

In terms of the composition of the MedInfo group that supports the Ministry's technical needs (from the standpoint of equipment maintenance, upgrades, accessories, etc.), there are twelve people working there, including engineers, programmers and network administrators. Some of these work part-time. They typically have low employee turnover and a consistent, high level of training for the employees.

This said, there is a considerable amount of individual initiative that goes unrecorded, even on the official Ministry websites. An interview with the Armenian equivalent of the "Surgeon General" yielded tremendously interesting facts about the development of public information materials (CDs, brochures, etc.). This is part of a broader pattern of fragmented, decentralized development of information materials that is typical in most ministries and organizations in Armenia.

Financial Component

There is no separate designated budget for an Information Technology development in this Ministry. Resources are allocated in general aggregated departmental budgets, and are utilized on an "as-needed" basis.

According to MedInfo, the total money allocated to health care in the national budget has been augmented year upon year, starting from 18 billion dram (\$36 million USD) in 2003, 24 billion drams (\$48 million USD) in 2004, and 34 billion drams (\$68 million USD) slated for 2005. MedInfo works with the Ministry of Finance, as well as with UNICEF, USAID and the World Bank on developing an immunization program. Interestingly, the interview with MedInfo yielded an idea that is seldom articulated in Armenia: that government funding for such programs is at an order of magnitude above the collective funding pool brought together by donor organizations, and that more of it comes from the state than from outside. Whether it is possible to discern the extent to which this is true, depends on how transparent the sources of the government's general budget can be. As it stands, this kind of information is not available to the public. In any case, such statements are in stark contrast to the culture of donor dependence that appears to be present in the majority of government Ministries in Armenia.

Technical Component

MedInfo have created a local area network (LAN), and established an internet connection via satellite internet. As is the case with almost all other government ministries, financial limitations are the main problem associated with maintaining internet connectivity on a consistent basis. Their 'knowledge management' systems are comprised mostly of local file servers, which reside at the Ministry in conjunction with a number of print servers; the Ministry's internal "knowledge" network is equipped with search functionality. Webmail use is common. They have a functioning framework to

connect with information systems in the Marzes, three of which currently have IT facilities thus far. These regional centers contribute to the aggregation of updated information about mortality, diagnoses, etc. for international classification of diseases.

In terms of physical infrastructure at the Ministry, there are 3 (Acer) servers in place (Mail, File/Print, Web), and a number of computers with varying levels of processor capacity. There are: 1 Pentium IV computer, 4 Pentium III's, 14 Pentium II's, 18 Pentium I's, 7 old Celeron processors, and 33 Celeron IIk; this means there are just under 80 machines. The Ministry has 8 copy machines (5 of which must be upgraded) and 44 printers, half of which are in acceptable shape. Across the board, approximately 50% of this equipment must be upgraded.

There is an optical line for the provision of internet and network connectivity that should be physically ready for the Ministry in 1-2 months, but which will be more expensive than the connectivity that MedInfo currently provides to the Ministry as an internet service provider. The issue of Armentel's telecommunication monopoly features prominently here as everywhere else; they have a downlink of 1 Mb, and a radio modem uplink of 128 Kbps.

Work with Donors

The Ministry of Health of Armenia has been working in collaboration with the World Bank, the World Health Organization (WHO), and USAID – in an information development program aimed at creating a computerized system of reporting. They have been gathering information for a National Database for the last 20 years, and have plans to add analyses, which are eventually to be made publicly available online. Data is collected on an ongoing basis from 600 facilities, creating the “Health System of Armenia” in conjunction with the National Statistical Service. Death and birth certificates are also issued. There have been known to be significant discrepancies between figures stated in the medical and the state systems – in large part because people who move or emigrate rarely report their change of status. For this reason, the integrity of the constantly updated health systems database is more likely to be accurate, according to the Director of Information Services.

MedInfo has worked with the WHO on data presentation systems, aggregating national indicators of various kinds (social, demographic, health) through until the end of the year. There is also work with PATCO – in a social transition program – which also financed the various information centers, and an electronic network (GHIS).

Conclusions about the ICT Climate

The purpose of this type of comparative “inventory” analysis is to lay a foundation upon which future e-government work in Armenia can be undertaken. The issues of sustainability and ownership in this country are critical; there is a strong tendency for projects to dissolve or disappear completely after funding runs out, in part because ownership and commitment by Armenian figureheads and organizations is not always

successfully assumed. In the words of one interviewee in response to the adage that ‘information is power’, “...the lack of information is *also* power...”. One may find that Armenia exemplifies this truism in many ways, after spending time interacting with and moving through certain ministries. Moving toward institutional transparency does not necessarily serve the purpose of those who are not suffering from the workings of the institutional status quo. Will the efforts of governments to push for the modernization of networks and for new ICTs serve to undermine mechanisms of governance and control whilst in ‘transition’? This notion addresses what Fountain (2001) terms the ‘perversity of incentives for institutional transformation’.¹⁷

Often, there appears to be perceived “buy-in” on the part of various departments or organizations for the simple purpose of securing grant money and acquiring the new hardware/equipment. This outcome has been manifested countless times in various ministries, and the result is that one finds a tremendously high degree of fragmentation in the IT ‘market’ for government work, not only in terms of policies and standards, but more specifically on the level of non-standardized fonts, non-interoperable machinery, etc. Furthermore, there are no guarantees that the IT equipment in question will ever be used to its full capacity, or that for it be directed toward the purpose of effectively delivering services to the citizenry.

The extent of political participation that e-government projects are created to provide is a social phenomenon that must be possible to manifest in the physical realm before they can work in the virtual realm. In other words, the social reality of a political culture characterized by ‘unpleasant’ interactions with all levels of public administration, as is the case in Armenia, can easily transcend the objectives of any IT efforts to provide the opposite. To provide online functionality that typifies an advanced polity is to present a solution thirty steps ahead of society; the technology itself can ‘leapfrog’ various steps and standards, but should not be geared toward leaping over public perceptions of ‘what could work here’ and ‘what could never work here’. Every society has its own answer to the question of effective ICT adoption, and in the case of transitioning countries, workable solutions are often hybrids; combinations of automation and social networking.

The climate for the use of ICTs in Armenia is still generally sub-optimal. The mini case of the Ministry of Health in this paper demonstrates some of these findings, although it is – compared to its institutional counterparts – still in better shape than most. This is because the development of its information systems is undertaken by (and outsourced to) an external (private) entity that benefits from decent remuneration, in stark contrast to the vast majority of ministries in which IT departments are in-house and yet peripheral (at best).

While there is little existing ICT infrastructure that can raise serious problems of interoperability and the organizational arena is ripe for change in terms of process/strategy innovation, there is still very little foundation laid for creating a culture of IT-savvy government workers. This comes from a work ethic heavily influenced by the communist experience, and the work patterns of a generation of workers and civil

¹⁷ Fountain.

servants who are generally resistant to organizational change, particularly in government. There is also a general dearth of incentives for change, on one level exemplified by a distinct lack of demand on the part of citizenry for access to information. People are simply not in the habit of asserting their rights to public information, whether that information is printed on paper or available in digital format. Meantime, precedents for the protection of monopolies of digitized public information have also been set; the Ministry of Justice and the IRTEK case is a shining example of such a problem. E-Governance therefore is still a long way off, because citizens in Armenia in general do not see themselves as the beneficiaries of public information provision.

There is little obvious sense of understanding as to where the main impact of ICTs will be in Armenia, and this is manifested by an obvious collective misunderstanding as to what e-government is supposed to accomplish. While this research is not meant to serve as a discouragement to those donor organizations spearheading efforts to develop the ICT sector and to follow through on the afore-mentioned recommendation of the famous McKinsey report, it is intended to shed light on the problems of developing automated processes that merely cover up (or compound) existing administrative/operational problems. The development of ICTs in government – in the support of systems both backend and front-end – should come not only from the united front of a coordinated and coherent donor stream, but in conjunction with genuine efforts to promote organic (as opposed to transplanted) growth strategies. Anything less will result in a continued flow of ineffective funding that misses the mark in terms of meeting the objectives of true institutional transformation, which in large part – and with few exceptions – describes the status quo in Armenia today.

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