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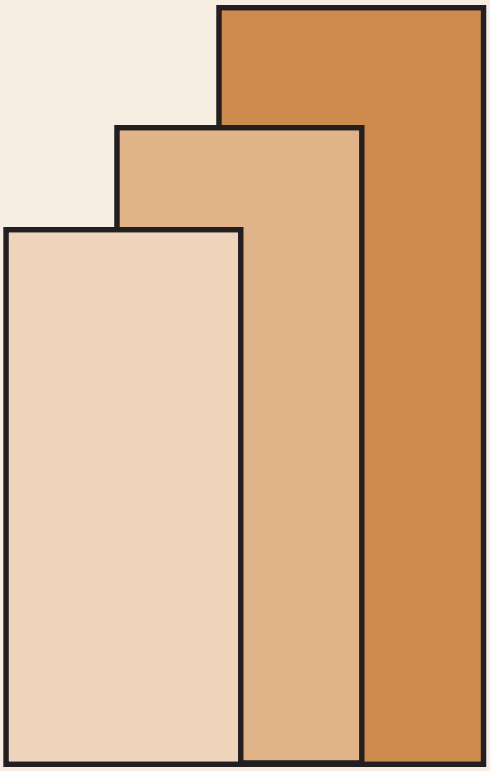
Gabrielle Iglesias

DISCUSSION PAPER SERIES NO. 2010-22



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e-Government Initiatives of Four Philippine Cities[1]

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* With thanks to Jennifer Francisco Matunding, research assistant.

Abstract

This study intends to provide a snapshot of the city government (in a developing country) as it uses information and communication technology (ICT) to transform its public service delivery and promote good urban governance. The volume of work related to services provided by local governments could be made more efficient, effective, transparent, accountable and equitable using relevant technologies. In the Philippines, a Government Information Systems Plan (GISP) was approved and adopted as framework for all computerization efforts of key services and operations. This study used as case study samples four city governments (Caloocan, Muntinlupa, Antipolo, and Tagaytay) known to actively use ICT applications to determine: (1) the level of use of ICT, and (2) how their computerization efforts facilitate good urban governance. The e-governance framework used for this study has a phased ICT utilization wherein a government agency must first use ICT to improve its internal operations (e-administration), then its public service delivery (e-government), before finally being able to use ICT to improve its relationship with its constituents (e-governance). The study was based on: (1) direct observations of their systems, (2) a review of their web sites, and (3) interviews with key officials whose positions corresponded to or were closest to a Chief Information Officer. The data was gathered from November 2003 to February 2004. Observations were finally assigned scores (using scales for each item), and analyzed along various components of e-governance. The results show two approaches among the cities in their development of ICT applications – (1) Muntinlupa City was doing a pull to e-governance by emphasizing its web site rather than internal administrative applications, while the other three were doing a push towards e-government by developing specific administrative applications that are not immediately accessible via the

Internet. No strong pattern can be detected among the four cities, but this can be expected since there was no common framework for their decisions to use ICT. All of the cities are concentrating on e-administration efforts. The city governments cited ICT for contributing to accuracy of records, increases in tax collection and other income, and improvements in efficiency, accountability, and transparency. Factors that may slow down ICT use for providing public service are the reported high costs to preparing a transactional website, and personnel issues over acquiring skilled employees and reducing staff turnover. Policy recommendations are: (1) emphasizing e-administration rather than website development to ensure that organizational processes exist to support public service delivery over the Internet; (2) city governments should develop their information policy; and (3) institute a system for identifying, anticipating and preventing problems and failures in local ICT investments.

Keywords: local governance, e-Government, e-administration, information and communication technology (ICT)

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1 The Value of Information and Communication Technology in Local Governance

Cities have a strategic advantage for e-governance operations: the needed telecommunication infrastructure, a concentration of businesses and citizens who may require public service facilitated by information and communication technology (ICT), and a rich reservoir of technical skills and human resources. However, the presence of these components for informatization does not automatically translate into automated public services that are economical, efficient, effective, responsive to public needs, or promote equity.

Around the world many services and documents are provided by local governments. The volume of work related to these services, the corresponding records-keeping, and the issuing of relevant documents could be made more efficient using relevant database, GIS and other technologies. Licenses, permits, and property taxes create sources of income for local governments. This income could be increased with improvements in the assessment and calculation of the value of fees and taxes and with better monitoring of tax evaders. Such income-generating services include the following:

- Residence services – community tax certificate, declaration of ownership of property, real property assessment, building permit, electrical permit.
- Regulation of business and professional service – business/cooperative registration, business license/ permit, certification of weights and measures, professional practice permit, public transport franchise, billboards and signboards license, sanitation inspection

certification, safety inspection certification, real property assessment, statement of value of property, declaration of ownership of property, electrical permit, Mayor's permit.

- Civil registry – marriage license, marriage certificate.

Some services and documents are facilitated by local governments, but are provided jointly with national and other local governments, to include the following:

- Public safety – police clearance, crime mapping, fire prevention services, jail management, public lighting; in some countries, local governments have control over police; registry/monitoring of convicted sex offenders and paroled criminals.
- Regulation of business – barangay clearance, registration in special economic zones.
- Transportation – traffic lights, road maintenance, road construction, traffic management.
- Education – construction of schools, management of public schools.
- Health –operation of public hospitals and health centers, emergency management services, regulation of water supply and water quality, waste management, drainage and sewerage, quarantine, provision for public cemeteries.
- Welfare – monitoring of informal settlements, curfew, youth development programs, centers for the aged, centers for drug rehabilitation, poverty alleviation programs.
- Economic growth – investment promotion, one-stop-shop for investors, tourism promotion, economic incentives, land use planning, infrastructure planning.

Information and communication technology applications have come into focus as tools for improving public service delivery. ICT commonly used are:

- Database management systems – electronic devices and routines for the storage, retrieval, manipulation, and display of data.
- Geographic information systems – electronic devices and routines for the storage, retrieval, manipulation, and display of geographic data.
- Networks – electronic devices and routines for the transfer of data; may be an Intranet, using a local area network or a wide area network; or over the Internet.
- SMS – short message system that allows sending and receiving of text messages over a cellular phone network; this technology can be connected to computers for storage of messages.
- Closed circuit television – television technology connected by a network to obtain images of areas in front of television cameras; this technology is increasingly used by local governments to monitor selected areas; CCTV can be combined with biometric face recognition technology for the identification of suspects, criminals at large, and terrorists.

This study tries to describe how these and other technology are used by local governments to provide services.

1.1 Rationale of the Study

This study intended to provide a snapshot of a specific type of public organization by describing their level of information production and sharing, the processes they went through to reach their current levels, and to learn from their experiences. In the information and knowledge age, government produces raw data and new information with more regularity than any other institution. "Information is at the heart of every policy decision, response,

activity, initiative, interaction and transaction between government and citizens, government and businesses and among governments themselves."[2] One may assume that ICT can improve the flow of information within government, but transforming public organizations and staff to make them willing and able to use such technologies is a complex process. Issues over funding, system maintenance, usability of systems, technical training, and increasing work demands upon staff are among the experiences of public organizations that adopt ICT.

It is important to emphasize that the goal of e-governance is not to be ready for ICT. ICT is always and only a tool for achieving public sector values of efficiency, effectiveness, equity, and responsiveness. This study merely appreciates that ICT has the potential to improve the interaction between the three partners of governance – government, business, and citizen.

The basis of the study is drawn from the experience of developed countries that lead in the use of ICT for local governance. For example, surveys in the United States have been conducted to determine the level of ICT use by local governments. For example, in 2000, the International City/County Management Association surveyed 1,881 municipalities and 850 counties on their e-government practices; 83% of respondents reported that their city/county has a website, and 44% experienced increases in demands for services as a result of e-government. The biggest obstacles to e-government according to the survey were: lack of IT/Web staff (66.6%), lack of financial resources (54.3%), and lack of IT/Web expertise (46.7%).

[2] UNDPEPA, *Benchmarking e-Government: A Global Perspective*, 2002, p. 8.

ICMA repeated the survey in 2002 and found that out of 4,123 municipalities and counties, 74.2% had a website, and 46.4% reported increased demands of staff. The biggest obstacles were: lack of IT/Web staff (65.7%), lack of financial resources (57.1%), and lack of IT/Web expertise (46.7%). It seems that while the number of local governments surveyed increased, and the number of local governments with websites had also increased during the two-year interim of the two surveys, the obstacles to e-government in 2000 were still present in 2002 – lack of IT/Web staff, lack of financial resources, and lack of IT/Web expertise.

The Digital State survey[3] conducted in the United States showed how state governments had an increase in the use and maintenance of network, database, and GIS technology into the operations of state-level local governments (please refer to Table 1). The survey asked questions for eight categories and gives raw scores from 0 to 3. Each score is added up per category, and the percentages are computed per category. The final score of a state is the average across all categories.

Table 1. Comparison of Digital State surveys, 2000 to 2002[4]

Category	**2000**	**2001**	**2002**
E-commerce & Business Regulation	58.54	59.5	59.5
Taxation & Revenue	68.06	78.0	74.2
Social Services	45.02	67.2	71.2 (est.)
Law Enforcement & the Courts	59.06	63.9	66.9 (est.)
Digital Democracy	67.14	82.5	Not stated
Management & Administration	70.70	76.1	Not stated
Education	64.14 (Higher Ed) 70.10 (K to 12)	86.2	74.2
GIS/Transportation	N/A	66.7	61.9
Overall Score	**62.85**	**69.7**	**65.4**
Number of Surveyed States	50	50	45

[3] Digital State Survey is made by the Progress and Freedom Foundation

[4] Lassman (2002), *The Digital State 2002: How State Governments Use Digital Technologies*, p. 1.

Ratings in Taxation, Social Services, Digital Democracy, Management and Administration, and Education show large changes in ratings. It is difficult to make comparisons because the surveys reported added questions and modified categories over time. However, descriptions in the survey note that:

- **E-commerce was "remarkably consistent"**. E-commerce referred to the use of the Internet and Intranets to locate, file and store paperwork for payments of fees and taxes, as well as for procurement and intra-governmental projects. The survey results showed that there was little change in the use of ICT for e-commerce. This may mean that e-commerce applications are relatively stable, and that once state governments have begun to use ICT for commerce, it is unlikely that these financial transactions will go back to manual record keeping.

- **20 states had perfect scores for Taxation & Revenue**. The other thirty states also had well-developed applications that enabled tax payers to at least receive online or email notification of the status of their tax filing information. Taxation applications and prompt feedback for taxpayers may also represent a stable application for Philippine cities. Not only can such applications enable local governments to track tax payments, transactions can be made transparent by allowing taxpayers to track their own payments.

- **One-third of states are revisiting data storage policies**. Data storage policies include constituting commissions or boards that review state policy over the storage of and access to data, and the creation of a chief information officer or equivalent position.

- **Only one state does not have a formal group to coordinate GIS data**. At the state level, GIS is used within transportation management and road maintenance functions.

Most states are dealing with multiple data layers including roads, traffic restrictions, road quality and maintenance, and traffic flow. These GIS data sets come from different state-level departments, and coordination is required to ensure that the data sets are consistent with each other, and can therefore be used together (*integrated*). Philippine cities also have many city-level offices that can independently maintain GIS data; coordination of GIS data is therefore a consideration if there is evidence of a spreading of GIS applications.

In the Philippines, Executive Order 265 (adopting a Government Information Systems Plan) and the provision in Republic Act 8792 (E-Commerce Law) requiring government agencies to have websites are two important policies that may have encouraged computerization and government web presence. Factors like available resources, political leadership, economic capacity, and the tendency of the private sector and civil society to use ICT also have an impact on the scope and breadth of a government's e-governance policy. What is interesting is that local governments have at times demonstrated the capacity to conduct transactions online before national government.

In July 2000, a Government Information Systems Plan (GISP) was approved and adopted as framework and guide for all computerization efforts of key front line and common services and operations of the government (EO 265), to enhance overall governance and improve the efficiency and effectiveness of the bureaucracy. The intention of the GISP was to put an enabling environment, policies and appropriate institutional structures within five years of its approval, to allow for the full and unhampered implementation of the GISP. The vision of the plan was that government agencies shall have reengineered their business processes and started the automation of their frontline services and housekeeping systems.

The private sector was envisioned to respond to the enabling environment by building up its own capacity and making organization changes and investments required to provide quality ICT services to the government.

The government shall implement the GISP in three phases:

- **PHASE 1: Setting Up the Enabling Environment.** Formulate policies, provide incentives and guidelines, establish technology standards, benchmarks and standards that will improve public services. Improve and strengthen existing institutional structures and capacities of implementing agencies and local government units. Generate the necessary investments from the private sector, government, and other funding institutions.
- **PHASE 2: Building the GISP information infrastructure.** Develop the necessary information and communications technology infrastructure. Reengineer the various mission-critical and public sector management business processes
- **Phase 3: Sustaining the GISP.** Define ownership and management responsibilities, authorities, and accountabilities for each information system. Develop benchmarks and indicators for evaluating project performance. Establish a mechanism for continuous learning.

Following this line, this study tried to investigate the e-governance capacity of four cities in the Philippines: Caloocan, Muntinlupa, Antipolo, and Tagaytay. This study surveyed the city governments for the following reasons: (1) to determine the level of use of Information and Communication Technology (ICT), and (2) to determine how their computerization efforts facilitate good urban governance. The results are expected to

contribute to an understanding of how cities use ICT to achieve good governance, and to assess how prepared they are to engage in the new economy.

1.2 Methodology

This paper defined e-governance as the public sector's use of innovative information and communication technologies to deliver to all citizens improved services, reliable information, and greater knowledge in order to facilitate access to the governing process and encourage deeper citizen participation. It is also described as having a phased development in which a government agency must first use ICT to improve its internal operations (e-administration), then its public service delivery (e-government), before finally being able to use ICT to improve governance. This phased development is described in the framework in Chapter 3.

This paper used the case study method to focus on cities that are known to have ICT applications actively being used to improve both the efficiency of the city government and the interaction between the city government and its clients (mainly registered residents and businesses).

The study was based on: (1) direct observations of their systems, (2) a review of their web sites, and (3) interviews with key officials whose positions corresponded to or were closest to a Chief Information Officer. In some instances, two officials were interviewed; in the case of Antipolo City, one respondent was a private citizen who managed a commercial website for Antipolo (the city did not have an official website at the time of the survey). Some questions related to out-sourced GIS applications were verified with the company that developed the applications. The data was gathered from November 2003 to February 2004.

Observations were finally assigned scores (using scales for each item), and analyzed along various components of e-governance.

1.3 Summary of the Results

The four cities had many similarities and many differences in their e-governance initiatives. No strong pattern can be detected among the four cities, but this can be expected since there was no common framework for their decisions to use ICT. All of the cities are concentrating on e-administration efforts. At the time of the study, the four cities were acquiring hardware and software, and had applications for e-administration such as for budget monitoring and payroll.

There seems to be two approaches among the cities in their development of ICT applications – the pull and the push to e-governance. Muntinlupa City was doing a pull to e-governance by giving emphasis upon its web site rather than internal administrative applications. The other three were doing a push towards e-government by developing specific, non-web-based administrative applications that are not immediately accessible via the Internet.

The local governments cited ICT for contributing to accuracy of records, increases in tax collection and other income, and improvements in efficiency, accountability, and transparency. GIS in particular was cited to help reduce the time spent at field work for inspecting property, help reduce time spent in retrieving property records, and helped reduce time and money spent for verifying property characteristics.

Factors that may slow down ICT use for providing public service include national policies and methods for accounting online payments through credit card payments or e-

banking, the high costs to preparing a transactional website, personnel issues over acquiring skilled and reducing staff turnover of trained personnel. In addition, none of the cities reported any strong demands from the private sector or from citizens for online transactions, and none of the cities survey its website users for desired web content.

In conclusion, all four cities are improving their e-administration, and are good examples of the progression from e-administration to e-government. However, the four cities have a long way to go before e-governance can be reached, and reaching e-government seems to be a big enough of challenge for the time being.

1.4 Limitations of the Study

The study is designed to be a comprehensive survey of the ICT acquired and used by the four case study cities, and to connect the findings to the development of e-governance in the cities. The cities were selected because: (1) The city governments had a relatively good set of ICT applications, and therefore already had some e-governance experience that can be studied; (2) They had at least intentions to develop GIS applications; (3) There were no published e-government assessments of the cities and the study may uncover new data.

Four cities are not enough to draw conclusions over the e-governance of all Philippine cities. Limitations of time and funding did not permit a survey of all cities. However, the study's methodology can be replicated in future research to cover more cities until a full survey is made. The methodology can also be used to track cities over time in a longitudinal study that can be designed to show stability of e-governance applications and the relative importance of the factors studied.

2 Previous ICT Assessments of the Philippines

Some assessments and surveys of the Philippines have been made on various aspects related to some of the requirements for e-governance. These surveys are briefly presented in this section. The general picture of the usage of ICT in the Philippines is that efforts are still concentrated in early stages of development of applications and of proliferation of the associated physical and policy infrastructure.

2.1 The Networked Readiness Index 2003

The Networked Readiness Index[5] (NRI) was developed as a global framework to map out the factors and dimensions that contribute to the capacity of countries to participate in and benefit from ICT development. The NRI was applied to **102** countries in 2003; the top ten countries, the top six ASEAN countries, and the ranks of the Philippines in the NRI sub indices are shown in Table 2. It is shown in Table 2:

Table 2. 2003 NRI Ranks for Top 10 and ASEAN Countries, and Ranks of the Philippines

2003 NRI Rank (out of 102 countries)	Country	Component/ Sub index	Rank of Philippines
1	US	*Environment*	82
2	Singapore	Market	78
3	Finland	Political & Regulatory	63
4	Sweden	Infrastructure	94
5	Denmark	*Readiness*	72
6	Canada	Individual	65
7	Switzerland	Business	80
8	Norway	Government	56
9	Australia	*Usage*	50
10	Iceland	Individual	72
26	Malaysia	Business	59

[5] The NRI is the product of collaboration between INSEAD, World Bank and World Economic Forum.

38	Thailand	Government	29
68	Vietnam		
69	Philippines		
76	Indonesia		

The index is a summary measure with three component indices: environment, readiness and usage.

- **Environment**: market, political and regulatory, infrastructure; it measures the degree of conduciveness of the national environment for the development and use of ICT. The ranking for environment was very low (82nd place), with the ranking for the subcomponent of infrastructure the lowest (94th place) for all the subcomponent rankings.
- **Readiness**: it measures the capability of the three principal agents of an economy (individual, business, government) to utilize the potential of ICT, and the country obtained a low ranking for this as well (72nd place). The rankings of the three principal agents seem to indicate that government is the most ready to use ICT
- **Usage**: it tries to measure the degree of usage of ICT by the three principal stakeholders of the NRI framework (individual, business, government). Indicators include changes in behaviors, lifestyles, and other economic and non-economic benefits brought about by the adoption of ICT. The ranking for the Usage component is the highest among the three components (50th place). One interesting point is that while the Philippines was low in the index, government performs better than the business sector in the sub-indices. This may indicate that the government's computerization is faster than the business sector. Since the NRI ranking was made in 2003, three years after the implementation of the 2000 GISP, it may reflect a positive effect of the government's computerization policy.

2.2 The Global Technology Index 2001

In 2002, the Global Technology Index[6] (GTI) was published as an assessment of each country's potential for economic growth in the New Economy (the information-based economy). The assumption is that previous material and service-based measures (GNP and GDP for example) do not reflect the factors that will support current growth. The GTI was applied to 49 countries in 2001. The top ten countries in 2001 and the top five ASEAN countries are shown in Table 3:

Table 3. 2001 GTI Ranks for top 10 and ASEAN Countries

2001 GTI Rank (out of 49 countries)	Country
1	USA
2	Sweden
3	Finland
4	Japan
5	Germany
6	Canada
7	Netherlands
8	Iceland
9	United Kingdom
10	Australia
17	Singapore
30	Philippines
37	Malaysia
48	Thailand
49	Indonesia

The index was proposed as a set five qualitative and quantitative composite indicators of New Economy growth factors: knowledge jobs, globalization, economic dynamism and competition, transforming to a digital economy, and technological innovation capacity. A

[6] Developed by the META Group. See Annex 6 for a description of the indicators.

brief discussion of the indicators follows; Annex 6 contains the list of indicators for each of the following aspects.

1. **Knowledge Jobs –** This refers to the number of people in knowledge- or information-based jobs, including IT- or engineering-based jobs, requiring higher skills training as well as the enrollment of people in higher education institutions.

2. **Globalization –** A country must shift its scope from competition in a national economy to competition in a global economy. The assumption of the index is that countries must reduce economic and trade barriers, support technological innovation towards new enterprises, and sell products and services to a global market.

3. **Economic Dynamism and Competition –** Competition refers to the ability of companies to apply technological innovation in order to create the new products and services, and the speed of marketing these products and services. IT companies will have to be dynamic, entrepreneurial, fast, and adaptable.

4. **Transformation to a Digital Economy –** Instead of making deals face-to-face, exchanges of physical goods and paper trails, this measures the capacity for virtual relationships, Internet transactions and virtual exchanges of money, products and services. Capacity is indicated by the quality of the physical infrastructure used for computerization and access to the Internet.

5. **Technological Innovation Capacity –** In addition to the old considerations of labor, capital, and production inputs, this measure considers increases in knowledge. The increase in knowledge is indicated by a country's expenditures for Research and Development (R & D) and R & D resources.[7]

[7] This factor echoes the concept of endogenous growth, where the growth unexplained by GNP is explained by long-run equilibrium factors, so that growth is expressed simply as $Y=AK$, where A is any factor affecting

The Philippines obtained the following ranks:

Table 4. 1999 to 2001 GTI Rank Scores for the Philippines

	1999	2000	2001
Knowledge Jobs	1	8	3
Globalization	35	41	44
Economic Dynamism and Competition	34	39	36
Transformation to a Digital Economy	32	35	39
Technological Innovation Capacity	38	38	45
Overall out of 49 countries	**26**	**32**	**30**

The 2001 GTI described the Philippines as having excellent scores in "Knowledge Jobs" set of indicators, ranking 3rd for "availability of senior management", 4th for "availability of IT skills", and 12th for the number of qualified engineers.

In contrast, the country performed poorly in "Technological Innovation Capacity" indicators, ranking 46th in terms of number of patents issued, and 47th for total R&D expenditure. In the analysis of the researcher, these low rankings are very disturbing because they show whether the country's scientific and technological personnel are able to convert their training and know-how into products or processes that can be used by the various economic sectors.

2.3 The Philippine Government Websites Survey 2002

Digital Philippines studied **140** national government websites from September 2001 to April 2002. The websites were evaluated using the "Five Stages of e-Government"

technology. In this equation, R&D expenditures and development of human capital will have a large impact rather than low costs of labor. This may explain why poor countries with lower expenditures in education now face greater difficulty competing in the Next Generation economy. Conversely, Southeast Asian countries with a cultural emphasis on education have potential to compete.

framework of the United Nations and the American Society of Public Administration. This section has a brief description of each stage; the annex has a more elaborate table on the characteristics of each stage.

- Stage 1 "Emerging Web Presence": a government website that serves as a basic public information source indicated by FAQs, contact information and other static information about the agency.
- Stage 2 "Enhanced Web Presence": a government website that provides basic static information, that is updated regularly, includes documents/resources that may be easily downloaded and has features that allow a site search and e-mail for queries/comments.
- Stage 3 "Interactive Web Presence": a government website that acts as a portal. It allows users to search specialized databases, and to downloaded forms or submit forms online.
- Stage 4 "Transactional Web Presence": a secure government website that will allow users to directly access services based on specific needs, and complete transactions online.
- Stage 5 "Fully Integrated Web Presence": a country website where all services, transactions and links can be done through a single central portal.

The following table shows the results of the survey:

Table 5. Analysis of 2002 Philippine National Government Websites by Stage

Stage	Number	Percentage
Emerging	34	24.29
Enhanced	59	42.14
Interactive	27	19.29
Transactional	0	0
Fully Integrated	0	0
Not Available at time of visit	20	14.29
Total	**140**	**100.01**

The results indicate that the websites surveyed still belonged to the early stages. Websites still tended to provide one-way information from the government to the people who view the sites.

2.4 Inventory of the GIS Capability of LGUs 2003

The National Mapping and Resource Information Authority posted an inventory of Philippine local government units (dated as of December 2003).[8] Their GIS capability was categorized into four stages, from mere acquaintance with GIS to having an operational GIS. The following table shows the breakdown of **1,690** local government units (LGUs):

Table 6. Level of GIS Capability of LGUs, 2003

Stages	Cities	Municipalities	Provinces	Total
Operational	13	5	4	22
Developmental	23	34	18	75
Gestation	33	172	20	225
Sub-Total	*69*	*211*	*42*	*322*
Acquaintance	46	1,285	37	1,368
Total	**115**	**1,496**	**79**	**1,690**

The data showed that LGUs are acquainted with GIS, but most have not begun developing applications. Examining the data by type of LGU, we find that more than half of the provincial governments have begun developing GIS applications. Less than 1 per cent of municipalities have operational GIS, and 86 per cent of municipalities have only an acquaintance with GIS. More than half of the cities have begun developing GIS applications, and 11 per cent of cities have operational GIS.

[8] The basis for the categorization and the method of data collection was not specified. The inventory is available at: http://www.namria.gov.ph/downloads/gis_dev.xls

2.5 Survey of the Level of Computerization Initiatives of Local Governments 1999

The Governance and Local Democracy Project conducted a survey of the computerization initiatives undertaken by local government units using a self-administered questionnaire sent by mail or fax. The data shows that there are a variety of reported applications that are already being developed by provincial and local governments.

The report received responses from 46 provincial governments. The percentages of reported applications developed or were being developed during the period of the survey from June to October 1999 are shown in the next table:[9]

Table 7. Level of application systems development for 46 provinces

Application System	Level of Development (%)				Total (%)
	Being used	Completed not used	On-going development	On-going data build-up	
Payroll System	38	4	17	4	63
Real Property Tax Assessment System	29	8	21	4	62
Personnel Management Information System	33		21	4	58
Accounting System	17	4	29	4	54
Real Property Tax Billing System	13	4	17	4	38
Budget Monitoring System	8		21	8	37
Remittance System	21		4		25
Supplies & Inventory Control System	21	4			25
Property Management Information System	8		13	4	25
Cash Management System	4	4	17		25
Business Permit and Licensing System	4	4	13	4	25
Cash Collection System	8		13		21
Programs & Project Monitoring System		4	13		17

[9] The survey asked respondents to assess the level of application systems implementation into 8 levels, from "Being used" to "No interest". The table shows only the responses related to level of development.

Document Tracking System	8	4	4		16
Engineering Equipment Monitoring System	4	4	8		16
Legislative Information System	8		4		12
Hospital Information System	4		8		12
IRA Funds Allocation Monitoring System		4	8		12
Quarry & Mining Permit System		4	8		12
Governor's/Mayor's Permit System	4		4		8
Market Administration System	4				4
Miscellaneous Tax & Fees System			4		4
Investment Monitoring System			4		4
Local Gov't Statistics Information System			4		4
Public Information System			4		4
Executive Information System			4		4

The results indicate that there is more application development than application use by provincial governments at the time of the survey. The top three applications in 1999 in terms of reported usage by the 46 provincial government respondents are: payroll systems, personnel management information systems, and real property tax assessment systems.

In terms of systems development, the 46 provinces reported that they first developed information systems for managing its money (payroll, real property tax assessment, accounting, remittances) and its resources (personnel management, supplies and inventory). Systems that were still under development at the time of the survey were also for managing money (accounting, real property tax assessment, budget, payroll, real property tax billing, cash management) and for managing resources (personnel management).

The report received responses from 36 city governments. The percentages of reported applications developed or were being developed during the period of the survey from June to October 1999 are shown in the next table:

Table 8. Level of application systems development and implementation for 36 cities

Application System	Level of Development (%)				Total (%)
	Being used	Completed not used	On-going development	On-going data build-up	
Local Civil Registry System	50		13	13	76
Real Property Tax Assessment System	30		13	13	56
Payroll System	23	3	13		39
Business Permit and Licensing System	20		17		37
Real Property Tax Billing System	17		17	13	47
Personnel Management Information System	17		17		34
Accounting System	10		13	3	26
Governor's/Mayor's Permit System	10		7		17
Budget Monitoring System	7	3	7		17
Local Gov't Statistics Information System	7			7	14
Legislative Information System	10		3		13
Tricycle Operations System	7		3	3	13
Property Management Information System	3	3	3	3	12
Remittance System	7			3	10
Cash Management System	3		7		10
Market Administration System	3		3	3	9
Occupational Permit System	3		3	3	9
Programs & Project Monitoring System	7				7
Miscellaneous Tax & Fees System			7		7
Cash Collection System			7		7
Document Tracking System	3		3		6
Building Permit Monitoring System	3			3	6
Investment Monitoring System	3				3
Public Information System	3				3
Supplies & Inventory Control System		3	3		6
Executive Information System			3		3

The results seem to indicate that there is more application use than application development by city governments at the time of the survey. The top three applications in terms of reported usage by the 36 city government respondents are: local civil registry system (50%), real property tax assessment system (30%), and payroll system (23%).

In terms of development, the surveyed cities reported that they first developed information systems for the civil registry, for managing their money (real property tax

assessment, payroll, business permits and licensing, real property tax billing) for managing their resources (personnel management), as well as the civil registry.

2.6 Summary of Previous ICT Assessments

Previous assessments looked at either the potential of the Philippines to use ICT and benefit from it (i.e. the NRI and GTI assessments), or surveyed various ICT initiatives of national government (Websites Survey) or of local governments (GIS Capability Survey and Level of Computerization Initiatives Survey).

International assessments of readiness painted a general picture of a low state of readiness in 2001 and 2003. Both the NRI and the GTI gave low overall assessments of the environments that support the use of ICT and the Philippines' participation in the digital economy. Local assessments of web sites of national government agencies and GIS capability showed predominantly basic levels of each.

There were still some bright spots to be found. The Philippine national government had a relatively good ranking in terms of usage of ICT and people in knowledge- or information-based jobs. Some provincial governments and city governments reported a variety of applications in various stages of development.

3 A Framework for e-Governance

E-Governance is the use of Information and Communication Technology (ICT) to promote governance, governance being the process of cooperation among the three partners in development – government, business, and citizen organizations – to guide themselves in decision-making and policy-making. At this point in time, the main technology used for e-governance is the Internet as it hosts web-based applications that connect the public to government services, information and decision-making.

It should be clarified that ICT are merely tools to be utilized by the three partners in governance: governments, the private sector, and civil society. The ultimate objective is to improve the process of governance within and among the three partners. ICT can help reach this objective by improving the flow of information, the storage of data, and the access to information whenever it is needed.

UNDPEPA has an e-governance framework that shows an appreciation of the different levels of application of ICT for the public sector (please see next figure).

E-Government:	*Inter-organizational relationships*
	▪ Policy coordination
	▪ Policy implementation
	▪ Public service delivery
E-Administration:	*Intra-organizational relationships*
	▪ Policy development
	▪ Organizational activities

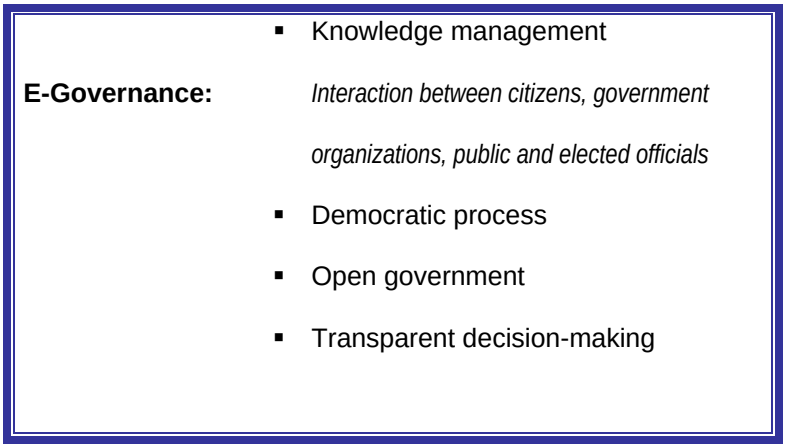

Fig. 1. UNDPEPA eGovernance Framework[10]

Computerization has to occur within a context, and in their framework that context is whether the objective is to improve a single agency's service delivery (e-Administration), or to improve how different government agencies coordinate their efforts to deliver related or connected services (e-Government), or to improve how the State as a whole interacts with its business and citizen partners in the governance framework (e-Governance).

This section discusses the difference between the e-government, e-administration and e-governance. It continues to elaborate on the basic ideas that should guide e-governance efforts, and ends with a modification of the framework.

3.1 E-Administration

Information technology is often used to improve the management of government. It has the potential to streamline business processes, improve the flow of information within government offices, improve coordination among city offices, and finally to serve as decision support for local officials. The first computerization efforts are usually done in this area, and often are in the following forms:

[10] UNDPEPA, *Benchmarking e-Government: A Global Perspective*, 2002, p. 54.

- conversion of paper files into digital form, and storage within computer databases and archives
- computerization of manual operations, such as computation of income, generation of payroll, generation of reports
- use of Intranet for intra-office communication and sharing of hardware such as printers and scanners
- use of facsimile machines, e-mail and Internet for communication
- use of the Internet for research
- use of barcodes for office equipment inventory and for document tracking
- payment of salaries via ATM accounts
- e-procurement, or the transparent purchase of supplies by government over the Internet
- updating and management of cadastral records using GIS

3.2 E-Government

E-Government refers to the use by government agencies of information and communication technologies (ICT) that have the ability to transform relations with citizens, businesses, government employees, and other arms of government in the delivery of services. ICT covers a wide range of applications making use of the Internet, computer software and hardware, computer networks, mobile phone communication technologies, global positioning system technology, and other similar electronic devices.

The focus of e-government is not the technologies that can be used, but on how to use technology to improve public service delivery. "E-government is about transformation that helps citizens and businesses find new opportunities in the world's knowledge economy. It holds great potential. Yet, if e-government is not part of a larger program for reform—reforming how government works, manages information, manages internal functions, serves citizens and businesses—then it may not produce all the benefits expected from the time and money invested. Use e-government to rethink the role of government. Use it as a tool to further economic development and good governance."[11]

A general classification of e-government activities would be as follows:

1. E-commerce – the exchange of money for goods and services over the Internet. Such activities are made possible by first entering into partnerships with banks and credit card companies, and then using websites to transfer the money from citizens to the city government's accounts. Examples of activities that city governments conduct through e-commerce include:

    - payment of taxes
    - payment of fees for birth/death certification
    - payment of fines
    - transfer of donations
    - renewing vehicle registrations
    - renewing driver's licenses

[11] Pacific Council on International Policy, *Roadmap for E-government in the Developing World,* p. 7

- payment of business licenses
- purchase of government data

2. E-services – the electronic delivery of government information, programs and services, often (but not exclusively) over the Internet. Many programs and services are delivered over the Internet, with the intention of reaching the widest audience possible. Examples of city e-services over the Internet are:

   - promoting travel and tourism to the city, posting such items as maps, hotels, restaurants, historic places, beaches, museums, transportation, currency and exchange rates, weather bulletins, etc.
   - promoting investment in the city by posting investment guides and providing downloadable forms for filing taxes, obtaining business permits, etc.
   - posting jobs available in the city, and accepting on-line applications
   - posting real-time traffic updates, as well as schedules for planned road repair
   - posting announcements, updates on city projects and programs, updates on environmental concerns
   - providing access to government data and maps
   - acting as a clearinghouse for data about the city
   - providing computer terminals with Internet access

   City e-services can also be offered within a closed network, especially when for the sharing of data that should be available only to government. Examples of such services include the following:

- Tracking sex offenders. This could involve a network of law enforcement agencies and local government units, and is found in countries where communities must be informed when a convicted sex offender moves into their localities.
- Providing support to special groups, such as child protection services.
- Law enforcement. APB, criminal profiles, criminal records, and other sensitive information are shared among law enforcement officers.

3.3 E-Governance

The UNDPEPA defines governance as "the process by which institutions, organizations and citizens guide themselves. Governance is also about the interaction between the public sector and how society organizes itself for collective decision making, and provides the transparent mechanisms for seeing it through."[12]

E-governance is therefore the public sector's use of innovative information and communication technologies to deliver to all citizens improved services, reliable information, and greater knowledge in order to facilitate access to the governing process and encourage deeper citizen participation. "It is an unequivocal commitment by decision-makers to strengthening the partnership between the private citizen and the public sector."[13] Examples of e-governance include:

- providing feedback channels to public officials, such as through e-mail or SMS
- increasing transparency of local government transactions

[12] UNDPEPA, *Benchmarking e-Government: A Global Perspective*, 2002, p. 54

[13] UNDPEPA, *Benchmarking e-Government: A Global Perspective*, 2002, p. 53

- strengthening devolution by support portals that require coordination between national and local government
- addressing social obstacles, such as digital divides among the ages and economic classes
- posting ordinances, as well as providing access to ordinances under deliberation
- providing on-line debate over proposed ordinances
- on-line hearings and on-line testimony by experts
- public opinion polling
- providing information on candidates and campaign finance
- on-line voter education
- use of electronic voting, from optical scanning of ballots to touch-screen voting booths
- Results of polls, on-line discussion, and online voting used directly in public decision making, implying trust in the automated components of decision-making.

3.4 Foundations of E-Governance

E-governance could be mistakenly perceived as driven by technological change alone, that improvements in public service delivery are attributable solely to the ICT bought and used by government. This would be an incomplete perception of the transition from a traditional government into an e-government, and of the efforts required in maintaining an e-government. Generally, successful e-governance in the Philippines will have to build upon

several foundations: mission driven, client centered, integration of processes and technologies, change management, and information policy.

Mission driven

E-Government always has an internal focus upon the mission of the government agency. The adoption of new technologies and new work routines should be made while keeping the values of good governance in mind – efficiency, effectiveness, transparency and accountability. In the end, government is expected to improve itself on these values; e-Government and its attendant ICT technologies may or may not be the key to the desired improvement. Each new technology requires many things before it can be absorbed:

- Conduct an inventory of needed data to run the technology.
- Conduct an inventory of the volume of transactions per public service provided by the city government.
- Conduct an inventory of tasks and routines, especially to trace routines that are performed by two or more offices.
- Streamline procedures whenever necessary.
- Conduct a training needs analysis and development of human resources.
- Conduct an inventory of work routines that have to be modified so that the technology can be utilized.
- Conduct feasibility studies, using cost-benefit analysis or cost-effectiveness analysis, that show that the technology will cause service will indeed become more efficient/effective/transparent, or will hold employees more accountable for their actions.

- Realign work duties whenever necessary. Some technologies can substitute for numerous personnel, who can then be reassigned to other offices that lack personnel.

Client-centered

E-government has the client as its external focus; the client can be an individual resident of the city, or a business registered in the city, or an individual who works in the city, or even a potential resident/business/worker. The resident citizen and the registered business are the primary targets of e-government, because it is their welfare that the city seeks to promote, their taxes are collected, and their votes that are sought.

E-government can focus on what services the clients want provided electronically, thereby reacting to stakeholder demands. Surveys in the United States show that the common desired electronic services are the following:[14]

- renewing a driver's license
- state park information and reservations
- hunting and fishing licenses
- one-stop shop for government services
- ordering birth/death/marriage certificates
- filing taxes
- voter registration
- access to a candidate's voting record

[14] Cook (2000). "What Citizens Want from E-Government".

- voting on the Internet
- accessing medical information from the U.S. National Institute of Health

Other services mentioned, although less frequently include:

- reviewing state police reports
- paying parking violations
- on-line application for unemployment insurance, welfare and health benefits
- access to child's grades and homework assignments

E-Government can also act as a catalyst for economic progress and social development by helping its business community. An important context to this is globalization, because companies are no longer merely competing with local businesses, but with global businesses. This global competition has to be met, and e-government can take the Local Economic Development perspective, and add the electronic aspect and compete for new economy opportunities:

- aggressively promote direct investment into the city using the city government's website to promote the benefits of investing
- encourage the private sector provision of Internet service, with all the attendant infrastructure (telephone lines, fiber optic cables, high speed Internet access, Internet cafes, website development, website hosting), all at affordable prices
- ensure a steady power supply
- ensure access to the banking infrastructure needed for e-commerce
- encourage the creation of e-businesses, and promote them on the city government website

- turn companies into partners who deliver e-services in behalf of the city government
- develop a supply of knowledge workers, by aggressively promoting training on computing skills that meet international standards for knowledge workers
- posting knowledge jobs available in the city, and providing a certification process for e-recruiters
- closing the digital divide by providing subsidized Internet access to poor people

Integration of Processes and Technologies

Effective e-government service is delivered independent of the organizational structure required to produce it. On-line one-stop shopping, government information portals, and inter-government sharing are examples of integration. Integration can occur along many vertical levels, or among several organizations:

- Identify processes or data used in common by offices within the city. A distributed database architecture and an office Intranet can localize the maintenance of the common data within one office while assuring other offices of access to the same data.
- Use common codes for the same data objects for all databases.
- To do one-stop-shopping style of e-service provision, make sure that clients fill up only one form that asks data required by all offices involved in providing a particular service, regardless of whether these offices are found in local governments or in national agencies. Automation can extract the data needed by each office and copy them into the respective databases.

- On the city government website, provide links to websites of the region and province to which it belongs, and even to the pertinent regional offices of national agencies.

Change Management

Employees are inherently resistant to change, and the degree and nature of the resistance affect the successful transition to e-government. Overcoming this resistance requires organizational "change management" by doing the following:

- Understand the cause of the resistance. People generally dislike having to learn new tasks, new software, and new gadgets, or may be apprehensive that they cannot learn new things, or don't have much time available for training, or are afraid that new technology would make them "obsolete". All of these causes tend to be present whenever new technology is introduced into any organization.
- Gain the trust of the organization's employees. Demonstrations of how the new ICT technology can help the employee do work faster, better, or more easily win advocates. However, employees who are given the opportunity to shape how and why they use ICT will increase understanding of the value of ICT for their work. This in turn leads to increased use of ICT, and probable increases in organizational performance.
- Develop ICT champions who can advocate for e-government, help lead the process, encourage other employees, and remind the organization to keep the focus on the mission and the clients. Such champions are recognized as crucial to ensure the completion of the process. Bottlenecks to the completion of ICT projects are due, for a great part, to the inability to complete data, to undergo training to use the new ICT, insufficient funds for

maintenance and upgrades, or unwillingness to share access to the new technologies and/or data.

- Involve the employees in the selection and adaptation of new ICT. People at the front-lines and doing the routine back-room operations usually know which services are more in demand, which processes are the bottlenecks, etc. All these are valuable input as to what type of improvement a new ICT must be able to provide.

- Promote collective "ownership" of the data and information. As in any computerized system of generating data or information, the rule is Garbage In-Garbage Out. Therefore, all employees involved in data production or in information generation have to be made cautious as to the quality of data, and conscious about keeping up-to-date databases. Ownership is not the same as access to data and information. Access should be regulated by an appropriate information policy.

Information Policy

E-governance requires a comprehensive policy framework that includes provisions to, among others, protect the privacy of individuals, enable e-commerce, provide for the security of data, and punish unauthorized or inappropriate use of private information. E-governance policies will need to deal with such issues as hacking and cyber crime, the use of digital signatures, security, credit card transactions, consumer trade, taxation of on-line purchases, freedom of expression, cyber stalking, etc.

3.5 Framework of the Policy Paper

E-government and e-governance will require inter-agency cooperation, the setting of standards and conventions on data, laws on the acquisition of data and its protection against inappropriate use or from hacking, and a systematization of procedures among government agencies. For example, effective coordination between two agencies requires both to agree on data formats, naming conventions, to agree on a work flow and data flow, to have similar client-centered approaches, and to have similar levels of computerization.

What is critical is that e-Administration efforts be mature before embarking into e-government or e-governance. Whether in a city hall or in a national department, computerization, use of databases, improved office procedures, and appropriate training at the agency level all provide the organizational support for e-government and e-governance. This research is proposing a refinement of the framework in eGovernance in three stages: eAdministration, eGovernment, and then eGovernance (please see next figure). In other words, to achieve eGovernance one must go through the first two stages in sequence.

There is a fundamental reason for this sequence. The effective use of ICT does not happen automatically; it does not have a "Plug and Play" quality. All technological innovations in organization must go through a process of acceptance of the idea by a champion, then by increasing numbers of staff. The idea of an ICT champion(s) is sometimes critical because it is this person or group's vision that creates "political will" and therefore the perseverance for all the necessary changes. These changes are what largely influence the success or failure of any application of ICT.

There are many examples of activities that an organization must undertake to integrate ICT into their processes in order to use the technologies for governance processes. Much planning is made to adopt ICT, to include the creation of a computerization strategy or plan. Changes in office procedures should be effected in order to harmonize with the systematic nature of computerization. Changes in policies regarding the continued storage and use of information must be made with the intent to improve the accountability for the accuracy and security of the data collected by the government. Change management seminars for employees, capability training for staff, and incentive systems to deter the pirating of trained personnel may be needed to ensure that government employees are aware and critically supportive of e-governance initiatives.

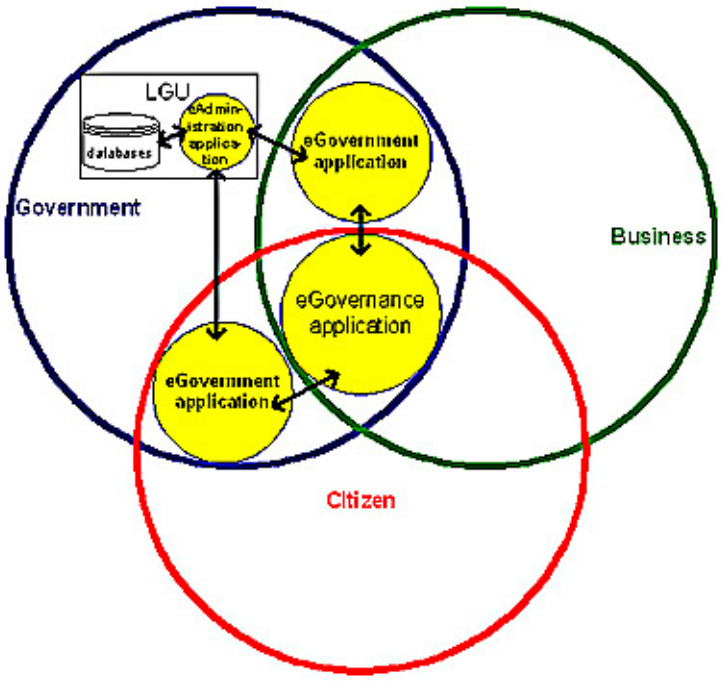

Fig. 2. Framework for shifting into eGovernance

E-government efforts extend beyond cooperation among State agencies. Applications can involve cooperation with the private sector (such as creating links to e-banks and e-money for online payment of taxes) and with individual citizens (such as paying real property taxes online). The shift to e-governance has truly happened when citizens and private sector have roles and power in public decision making (governance) and ICT is utilized for this purpose (e-governance).

Under the framework, jumping forward to e-governance applications are not advisable. While the intent to promote democratic processes using ICT is laudable, it requires that all governance partners are all familiar enough with the technology to be used and are equally "willing" to use technology for the same purpose. For example, there are real issues of the "digital divide" where age and socio-economic status have been related to Internet use. In the United States, income is directly related to Internet use, educational attainment is highly positively correlated to Internet use, Internet usage increases with age except for seniors (55 years and older) who show the lowest Internet use (DOC, 1999: pp. 34 to 35). If these patterns also hold in the Philippines, then attempts to provide e-governance may marginalize citizens by virtue of their inability to access services provided through the Internet.

On a more pragmatic note, public organizations and businesses have to be prepared to store electronic data, regularly check official email, become more transparent, and do other actions to put working human systems behind a website. Websites by themselves do not mean that e-governance is in place; it is how the website is put to use, the amount of useful information and interaction that can be made using the website that are key.

4 e-Government Initiatives: Antipolo, Caloocan, Muntinlupa and Tagaytay Cities

This study assessed the utilization of ICT in core services of four city governments in the Philippines and did this by categorizing questions in ten aspects, namely:

Information Infrastructure

- Implementation of their Government Information System Plan
- ICT equipment and infrastructure (including software used)
- ICT and management
- Geographic Information Systems (GIS)
- City Website

Applications

- Taxation and Revenue
- E-Procurement
- Electronic Commerce and Business Regulation
- Law Enforcement
- Digital Democracy

This study tried to evaluate the various systems of the selected city governments using a research instrument with questions related to the aforementioned ten aspects of ICT utilization. Direct observations and interviews with key officials whose positions corresponded or were closest to a Chief Information Officer were the basis for the data gathered on the core services.

The data essentially are scaled assessments of the quality of the presence and utilization of various ICT components and products. Questions on the information infrastructure tried to get a description of the organizational basis, physical equipment, and interrelationship between existing information systems and organizational processes.

Questions on applications tried to get data on what types of public services are delivered using ICT. The data are shown in Annex 2. The websites of the city governments were evaluated using the indicators developed by the UN-ASPA (please refer to Annex 3 for a table of the indicators).

The research instrument did not have many questions specific to e-governance for several reasons. First, governance modes of action that involve all three partners in development are still not prevalent practices. It would be unlikely, therefore, that online collaboration would be needed at this point. Second, past ICT surveys indicate that city governments in the Philippines have not developed much expertise in ICT usage, and that only some examples exist of cities with relatively extended or extensive ICT usage can be found. It was therefore deemed premature to be determining the extent of e-governance initiatives. Some questions related to cooperation and coordination with the business sector and private citizens were included under the various applications (specifically in the City Website, E-Commerce and Business Regulation, and Digital Democracy sections).

The data was gathered from November 2003 to February 2004, with follow-up interviews conducted from April to May 2004. This section summarizes the results for each of the ten aspects.

4.1 GISP implementation

Phase of implementation of the GISP

The respondents from the city governments were asked to assess to what phase of GISP implementation they belong:

- Phase 1: Setting Up the Enabling Environment.
- Phase 2: Building the GISP information infrastructure.
- Phase 3: Sustaining the GISP.

Of the four local governments surveyed, only the city government of Antipolo said it is still in the second phase of the GISP implementation (infrastructure building) while the three others are already on the maintenance phase.

Information sought at the information desk vs. information on the city's website

Information that are often sought at the city government's information desk can generally be grouped into three: a) location of offices b) processes of filing certain legal documents (applications for/renewal/clearances) and c) availability of certain local government officials and staff, and the location of their offices. If this information can be placed on the city's website, then clients who have Internet access may be able to save time and effort by getting answers on-line rather than going to City Hall in person.

Tagaytay City, primarily considered to be a major tourist spot in the country, also received inquiries regarding their current press releases, directory of establishments and information on the city government's activities and monthly newsletters.

Muntinlupa, on the other hand, had a public information booth where most of the answers to everyday queries can be seen (e.g. locations of offices, process of application and filing permits, tax declaration process).

Although these queries are everyday occurrences, most of these information are not available in the cities' websites at the time of the survey. Caloocan City is a little above the

others in that their website contains some of the information stated above. Muntinlupa City's website has the procedures for filing different applications and renewal.

The lack of correspondence between the information at the public desk and the website should be studied further to know if it is indicative of needing a client-focused orientation in their websites (i.e. using the website to provide the answers sought by walk-in clients) or if it is indicative of low-Internet usage of clients (i.e. most clients of cities do not use the Internet to collect information).

Job vacancy information

Muntinlupa had job vacancy postings that are currently available online and can be accessed through the city website, however limited. Around 25% or less of the city jobs can be processed online. The reason behind this is the infrequent use of this feature by people.

Job vacancy postings and job information were not available for the other three city governments' websites. Only Tagaytay City has expressed a plan to put up one in the future. Applicants must apply personally at the city government concerned or directly at the particular private firm that posted the vacancy.

4.2 ICT Equipment and Infrastructure

WAN Utilization

Caloocan City was the only city government in the survey that utilized a WAN. It was used primarily for service delivery and for connecting work stations of different offices, specifically with their North Caloocan Office.

Muntinlupa expressed an interest in joining a WAN in the near future in line with the 2020 vision of Muntinlupa City as the premier financial district of Southeast Asia.

Intranet Utilization

Antipolo and Muntinlupa were the only city governments in the survey that utilized a LAN/Intranet.

Antipolo's Treasurer's Office used it primarily to monitor and access data from the Permit and Licensing Office and the Assessor's Office.

Muntinlupa City used an Intranet to provide their employees with access (to news, reports, information, and data), and to facilitate collaboration among project teams. They also planned further use to disseminate documents, manuals, forms, and to provide online training.

4.3 Software used

City governments were asked what software were used for several of their functions.

E-governance

The e-governance function found were for land use planning. Antipolo did not use any software for land use planning, while Caloocan and Tagaytay both used a GIS viewing software ArcView, and Caloocan used AutoCad as well. However, public participation in the land use planning process was not in evidence, as electronic public involvement is usually done over the Internet. Examples of online land use planning is through electronic town hall meetings and posting proposed zoning or infrastructure on city websites.

E-government: E-commerce

The e-commerce functions found by the survey were for issuing of permits, licenses, business taxes, and real property taxes. None of the three cities offered Internet-based payment facilities.

Antipolo, Caloocan and Tagaytay cities used a configured, Unix-based database management system for issuing permits, licenses and business taxes (Business Permit and Licensing System) from the company Amellar Solutions. For real property taxation, the three cities used a GIS-based solution called Real Property Tax Administration also from Amellar Solutions.

Muntinlupa used Visual Basic to run a Business Permit Monitoring System, a Violators Monitoring System, a Licenses and Business Taxes System, and a real property tax administration system. These programs were developed by the MIS staff of the city government.

E-government: E-service

The e-service functions found in the cities were for applications in health, social welfare, education, employment, crime prevention, and the civil registry. All cities used the Standard Civil Registry System from the National Statistics Office. Muntinlupa City had additional computerized services: a Day Care Information System by the MIS that runs in a DOS environment, a Public Employment Management System by DOLE. Caloocan City had a GIS-based crime-rate monitoring system.

E-administration

The e-administration functions surveyed were for planning, budgeting, accounting, payroll, procurement, and supply management/inventory. All cities used a variety of software:

Table 9. Software/Applications used for administrative functions

Function	Antipolo	Caloocan	Muntinlupa	Tagaytay
Planning	MS Office	MS Office	MS Office	MS Office
Budgeting	MS Office	MS Office	Budget Monitoring System	MS Office
Accounting	GAAS	Excel	Accounting Information System integrating all the revenue generating offices	GAAS
Payroll	Excel	Excel	Personnel Management Information and Payroll System	Government Payroll Biometrics System
Procurement	None	MS Office	Procurement and Supply Management System (PSMS)	MS Office
Supply Management/ Inventory	None	None	PSMS – integrated with the procurement office	None

4.4 ICT and Management

Internet and Email Access for Employees

Three local governments of Antipolo, Muntinlupa and Tagaytay answered the same for the questions related to Internet and email access. Only some offices were allowed Internet access (details below), while email access was a privilege of specific department heads. Employees did not have direct access to email, although they could answer queries sent through email using a designated computer with internet access. Since Internet or email access was so limited, there was therefore no policy regulating Internet or email use.

Table 10. Internet and email access in the four cities

City Government	Offices with Internet Access
Antipolo	Collection, Assessor's, IT Office
Caloocan	None
Muntinlupa	All offices, but only heads have access
Tagaytay	Mayor's, Admin, EDP, PIO, City Planning

The offices of Muntinlupa City Government had at least one terminal for unlimited Internet access. This was monitored by the MIS office who can block access when needed. Internet access was limited to the heads of offices and for some staff, depending on the nature of the work of the department. Every employee had an email address. There was no policy on Internet and email access but they planned to make both.

Budget Provision for IT Systems

The budgetary provision for different components of IT systems was relatively extensive. The common budget items for the three cities were hardware maintenance, information system maintenance and GIS maintenance. The IT components that were provided for by the 2003 and 2004 city budgets are in the next table:

Table 11. Provision for IT components per city, 2003 and 2004 budgets

Requirement	Antipolo		Caloocan		Muntinlupa		Tagaytay	
	2003	*2004*	*2003*	*2004*	*2003*	*2004*	*2003*	*2004*
Software purchase								
Software license renewal							*	
Hardware purchase			*	*	*	*		*
Hardware maintenance	*	*	*	*				*
IS design			*	*				*
IS maintenance	*	*	*	*				*
GIS design								*
GIS maintenance	*	*	*	*				*
IT training			*	*				
Internet access	*		*	*		*		*
Website design			*	*				*
Website maintenance								*
Website hosting								*

Chief Information Officer

Only the city government of Tagaytay had a chief information officer with the designation of Officer-in-Charge of Electronic Data Processing Office (EDP). He oversaw technology policies, issues and operations of the city government. Muntinlupa had a similar position of the Management Information Systems (MIS) Office head.

Caloocan and Antipolo cities both agreed that they should hire an equivalent position in the near future.

Technical Assistance

With respect to the need for technical troubleshooting and assistance, the three local governments all had someone in the office who understood computers. For Caloocan and Muntinlupa, the MIS Office had a big part to play whenever a need arose. Antipolo consulted their software vendor Amellar Corporation. Tagaytay opted for the services of private technicians.

Benefits from Computerization

The local governments cited improvement in efficiency because it lessens time spent on computation and time spent for retrieving records.

Computerization helped improve their accountability because their systems clearly define the people who are allowed to access data that must be kept safe, provide different levels of access to sensitive data to city government employees, and monitor the activity of anyone who uses their system to prevent tampering of records. Computerization has also rendered their performance as transparent to many people because of the standardization of the bases for paying fees, permits and taxes. Data can also be counterchecked for errors.

4.5 Geographic Information Systems (GIS)

This part of the survey was conducted only for the cities of Antipolo, Caloocan and Tagaytay. At the time of the survey, Muntinlupa City did not have a functioning GIS.

Primary Use of GIS

The Antipolo, Caloocan and Tagaytay local governments were mainly utilizing for real property taxation. Day-to-day management of the GIS was given to the Assessor's office of Antipolo and Tagaytay. Caloocan gave the over-all responsibility to the IT Office. Spatial data were mostly created from paper tax maps and aerial orthophotographs. Additional data sources include paper topographic maps, road maps and land use maps.

Other Uses of GIS

The GIS was also used to provide other departments with spatial data to develop other applications. Additional use of the GIS per city is shown in Table 12.

Mapping on the City's Website

The city governments of Caloocan and Tagaytay said their website contained mapping features based on their GIS.

Table 12. Provision for IT components per city, 2003 and 2004 budgets

City	Other uses of GIS
Antipolo	Land Use Planning, Traffic Management
Caloocan	Mapping, Land Use Planning
Tagaytay	Mapping, Land Use Planning, Environmental, Traffic and Road Management, Disaster Management

Antipolo had also begun efforts to improve the addressing system in their city by reviewing the locations of streets, identifying those without names, developing a convention for assigning numbers to buildings, and lobbying for local legislation to support the system.

Benefits from the GIS

The Antipolo, Caloocan and Tagaytay local governments cited increases in real property tax collections as the benefit from the GIS. The increases in the collection were related to improvement in records management, mapping for taxation purposes, visual validation of property declaration, and in identifying delinquent taxpayers. The GIS was cited for improving their efficiency by reducing time spent for field inspection of property, reducing time and money spent to verify declared property characteristics, and for reducing time spent retrieving property records.

The system used by three cities was purchased from the same vendor. This system allows the property owner to view h/her property records and property map, to purchase printouts of their own property records, and so property owners are able to identify if their property is not correctly described. Thus the GIS is cited as having improved their accountability and transparency to their constituents.

The Caloocan local government gave additional benefits from their GIS:

- Engineering: GIS provides information on contours and elevation utilized for planning waterways or downspouts for the drainage system.
- Traffic Management: visualizes possible rerouting sites for traffic bottleneck scenarios.

- Crime monitoring: facilitates identifying crime-prone areas and for deploying policemen.
- Planning: visual representation to assist during conceptualization of projects to benefit as many citizens as possible.

Problems with the GIS

Different problems were identified by Caloocan and Tagaytay local governments, while the respondent from Antipolo City did not find any problem they could not solve. Caloocan City cited major problems are the mismatch between the personnel's GIS-related skills and the requirements of GIS, staff turnover of trained personnel, compensation for GIS personnel is not as attractive as in other places, costs of acquiring data, and costs of acquiring and upgrading software licenses.

4.6 City Website Management

Presence of a City Website

All cities had websites, although it must be noted that at the time of the survey, Antipolo City did not have an official website but recognized a commercial initiative created mainly to assist tourists. The study made an inventory of the components of each website using the UN-ASPA 5 Stages of E-government. (The inventory is shown in Annex 4.)

A clear distinction was seen from the three local governments with regards to their website. The Antipolo website, being a commercial initiative, had been constructed in 1999 and updating was done at least once a week.

Both Tagaytay and Caloocan constructed their websites from 2000 to 2001. Tagaytay updated once a month, while Caloocan updated once a year due to late submission of data by their offices.

Muntinlupa's website was constructed from 2002 to 2003 and updating of the website the department data and the newsletter was done. Emails from the constituents to the Mayor were read daily and reported as soon as possible to the Mayor himself.

The components of each website were inventoried and classified as features of the UN-ASPA Five Stages of e-Government (please refer to Annex 4 for the inventory). The inventory of the websites shows that Muntinlupa, Antipolo and Tagaytay have Enhanced (Stage Two) Websites, and have begun to develop interactive features. Caloocan's website is only at the Emerging stage. The next question gives an extended description of the processes behind the websites.

Website Management

The day-to-day management of the website was under the responsibility of:

- Caloocan City – private contractor (Amellar Corporation)
- Muntinlupa City – MIS office
- Tagaytay City – EDP Office

Difficulties in maintaining their website were related to retrieving data related to online items that must be updated frequently, and insufficient funds for maintaining their website.

Website Promotion

Promotion of each city's website was done through different modes:

- Antipolo City – No promotion by the city. Foreigners/visitors searched for them through web search engines.
- Caloocan City – press releases, posters, flyers
- Muntinlupa City – press releases (newsletters), and other means through correspondences to constituents abroad and associations like the League of Cities.
- Tagaytay City – letterheads, streamers, newsletters

Specialized databases accessible through the website

- Antipolo City – e-cards, chat rooms, forums/bulletin board, people search, email (for interactivity purposes only)
- Caloocan City – Real Property Tax and CRS (for viewing purposes only)
- Muntinlupa City – none
- Tagaytay City – none

4.7 Taxation and Revenue

Muntinlupa City estimated that 26 to 50% of tax forms were downloadable, and both Caloocan and Tagaytay estimated that 25% or less of tax forms were available online through the city governments' websites, but online payment was not yet possible. Caloocan and Tagaytay cities scheduled the implementation for online payment during CY 2004.

4.8 e-Procurement

With the exception of Antipolo City, the three city governments were utilizing e-Procurement by purchasing products over the net (Muntinlupa and Tagaytay) and posting requests for bids or proposals (Caloocan and Muntinlupa).

4.9 e-Commerce and Business Regulation

Caloocan, Muntinlupa and Tagaytay city governments were already into e-Commerce and Online Business Regulation to some degree. All three city governments did not have online forms or online payment. Tagaytay City had downloadable forms such as Business permit forms, Zoning and electrical application forms. Caloocan City constituents could download Real Property Tax assessments as well as business permits forms. Muntinlupa City residents could download business permit forms. They had not engaged citizen or business participation in the development of their online services.

4.10Law Enforcement

ICT use in law enforcement can be seen as minimal in all four cities. Although they all had digital mobile technologies available for law enforcement offices connected to a digital communication network, they all did not have video-conferencing capabilities intended for high security communications; Tagaytay already purchased the equipment but the system was not operational at the time of the survey.

Muntinlupa City had an anti-drug abuse campaign called the CRUSADA Text Hotline (0920-7272311) which allowed constituents to give drug abuse related information to the authorities with anonymity. This information is coursed through the DAPCO Drug

Enforcement Unit or Task Force Kidlat. CRUSADA won the "Trailblazing Program" 2003 Galing Pook Awards given by President Macapagal-Arroyo.

A computerized system integrated with other law enforcement agencies was not available.

4.11 Digital Democracy

Among the three city governments, Caloocan City was the only one actively engaging in digital democracy measures such as providing for locations of polling places, posting names of local candidates for local elections, conducting voter education, and precinct information in their website, except that still no citizen can vote online. This information was available during the May 14, 2001 elections campaign period.

Muntinlupa City had provided data on the number of registered voters per barangay, but did not have data on the location of polling places. The city government was considering putting up names of local candidates for elections by March 25, 2004, but they discontinued the activity because it may be perceived as electioneering.

Tagaytay City had posted names of local candidates for local elections.

Only the mayors of Tagaytay City and Muntinlupa City posted their email addresses on their respective city websites: mayorfrancistolentino@tagaytay-city.org and jaime.fresnedi@muntinlupacity.gov.ph.

4.12 Some Feedback from Citizens: Caloocan and Antipolo Cities

A small survey was made of citizens was made to get some indication of whether citizens are aware of the computerization efforts of their city governments. Ten citizens from Caloocan were interviewed, 5 residents and 5 business owners. Ten citizens from Antipolo were interviewed, 5 residents and 5 business owners.

Thirteen respondents noted benefits from the computerization, and all were associated with the computerization of their real property taxation. The benefits mentioned were faster service (from 6 respondents), systematic processing (2), accurate taxation (2), and transparent taxation (1).

Seven respondents did not see any benefits from the computerization. Description of the processes at city hall after computerization were that processing was still slow (from 3 respondents), corruption was still present despite computerization (2), city hall employees were still inefficient (1), and the local government still raised taxes (1).

Communicating what computerized products are available, such as printouts of tax maps and the website, may be needed. Only 3 of the 10 interviewed residents knew that tax maps were available. Only 4 out of the 20 respondents knew about the websites of their respective cities.

5 Summary and Comparison of the Four Cities

The four cities had many similarities and many differences in their e-governance initiatives. No strong pattern can be detected among the four cities, but this can be expected since there was no common framework for their decisions to use ICT. The possible responses for each of the survey questions were scored as a scale from least to most desirable.

The data for each component of e-governance are scaled assessments that reflect the presence of ICT in local governance processes, and the extent of ICT presence. Each city has a score that can be compared with the maximum possible score. The closer a city is to the maximum score, the better is its use of ICT to achieve the goals of good governance. The summary of the scores for the various aspects of e-governance are shown in Table 13:

Table 13. Survey Scores of the Four Cities by Component and Per cent of Total Scores

Component	Highest Score Possible	Antipolo	Caloocan	Muntinlupa	Tagaytay	Total of 4 cities
E-governance	7	0	3 43%	0	0	3 11%
E-government Applications	46	2 4%	16 35%	13 28%	15 33%	46 25%
Website	19	2 11%	7 37%	11 58%	7 37%	27 36%
GIS	21	9 43%	13 62%	0	15 71%	37 44%
Software	34	16 47%	18 53%	15 44%	18 53%	67 49%
GISP	13	2 15%	4 31%	9 69%	5 38%	20 38%
ICT and Management	41	14 34%	21 51%	15 37%	18 44%	68 41%
ICT Equipment and Infrastructure	62	17 27%	19 31%	37 60%	13 21%	86 35%
TOTAL	**243**	**62 26%**	**101 42%**	**100 41%**	**91 37%**	**354 36%**

The initial analysis of which components are where the cities had the best overall performance are for Acquisition and use of software (49%) and GIS concerns (44%). Caloocan and Muntinlupa had the best overall performance among the four cities (42% and 41% respectively). Software concerns seem to have the least variation among the cities (from 44% to 53%), while GIS concerns had the 1st and 3rd highest performance by any city for all components (71% and 62% respectively).

Achievements in E-governance

Another analysis is to summarize the scores into four main categories (E-government, E-administration, ICT Management, ICT Equipment and Infrastructure) and a few items for E-governance:

- E-governance – this category combines items related to involving the two partners in governance, the business sector and civic society, in public decision-making through ICT applications, including decisions over how ICT applications may be used to provide public service.
- E-government – this category combines E-government Applications and Website sections.
- E-administration – this category combines the Software Usage and GIS sections.
- ICT and Management – this category refers to organizational and information system plans to develop and maintain information systems, and use information products, including GISP.
- ICT Equipment and Infrastructure – this category refers to hardware and physical networking of ICT equipment.

Table 14. Comparison of Scores of the Four Cities by Category[15]

Category	Max. Score	Antipolo	Caloocan	Muntinlupa	Tagaytay
E-governance	7	0	3 43%	0	0
E-government	65	4 6%	23 35%	24 37%	22 34%
E-administration	55	25 45%	31 56%	15 27%	33 60%
ICT and Management	54	16 30%	25 46%	24 44%	23 43%
ICT Equipment and Infrastructure	62	17 42%	19 31%	37 60%	13 21%
TOTAL	**243**	**88.1**	**167.25**	**145.83**	**135.62**

All of the cities are concentrating on e-administration efforts. At the time of the study, the four cities were acquiring hardware and software. All cities had applications for E-administration (e.g. for planning, budget monitoring, accounting, and payroll). Three cities reported having procurement systems as well.

Caloocan and Muntinlupa cities have more of the e-administration and e-government components asked for in the survey. Muntinlupa City had more ICT Equipment and Infrastructure, especially due to its use of an Intranet and its high use of its website. Muntinlupa City received a Galing Pook Award for its Crusada Hotline in 2003, an application using SMS.

Caloocan City's better performance at managing its ICT applications may be due to specific budget allocations for system design and maintenance. Among the four cities, Caloocan performed the best at developing e-government applications and seemed hampered only by the delay in updating their website. However, the city government was developing a system to allow for online access to property taxation history and payment of fees. They also

[15] Figures are rounded off; totals therefore do not seem to tally with table entries.

provide election-related data on the city website during local election years, usually close to voting day.

Caloocan City also scored much lower than Muntinlupa at ICT Equipment and Infrastructure component and its website is only at Stage One. However, it performed as well as Muntinlupa because it is using its GIS and has more e-government efforts. This may indicate that the number of computers and other hardware is not the main factor that spurs e-governance initiatives for various local governance functions.

Tagaytay City obtained a score not too far from the first two, and was the only city with a Chief Information Officer. This means that there was a position with the responsibility for the development of useful information from a public perspective. This position can also be responsible for the judicious distribution of information to the public. Muntinlupa City had a Management Information System Office, and Caloocan City had an Information Technology Group with an internal orientation and mostly did applications development and information infrastructure maintenance.

Antipolo City's score was affected by their lack of an official website, lack of a CIO or similar position, and minimal development of e-government applications. However, while the city were behind the other three cities in terms of scores on the survey, follow up interviews revealed more initiatives taken by Antipolo City. They had already ventured into geo-coding that required ordinances effecting standards for building addresses, the naming of all streets, and the densification of control points before the corresponding GIS application can be developed.

At this point, the three cities with GIS applications were compared for similarities. All three were behind Muntinlupa City in terms of ICT Equipment and Infrastructure, and yet were at par in terms of Software Usage, and had working GIS Applications. This may indicate that ICT Equipment and Infrastructure are not critical to developing e-administration and e-government initiatives.

In summary, there seems to be two approaches among the cities in their development of ICT applications – the pull and the push to e-governance. Muntinlupa City was doing a pull to e-governance by giving emphasis upon its web site rather than internal administrative applications. Muntinlupa City had been publicly recognized for its comprehensive website, and had more content (such as online tourist information, over 1000 ordinances, and forms). However, online transactions require good database systems, clean records, integration of systems, and security. To respond to the pull or need to keep its online content up-to-date, the city had to improve the speed and quality of its service. Its e-administration efforts were the next point of emphasis as evidenced by the ongoing conversion of its database system from flat files to relational database systems.

The other three were doing a push towards e-government by developing specific administrative applications that are not immediately accessible via the Internet. These applications are the bases for online extensions of their service once the systems are running well. It seems that there need not be a direct relationship between the amount of ICT equipment and infrastructure with the ability of a city to use ICT. Muntinlupa had more ICT equipment and infrastructure, but Caloocan and Tagaytay and had developed more E-government applications.

Caloocan and Tagaytay cities had concentrated on GIS-based real property taxation system and has begun to develop some systems based on it, such as for crime mapping and road maintenance, with Tagaytay having developed more applications. They also have the same business permit and licenses system. Even though Caloocan and Tagaytay gave less emphasis to their websites, Caloocan was developing an online payment system for taxes and fees, while Tagaytay already had a Chief Information Officer overseeing its use of ICT.

Antipolo City had less equipment, hardly had any e-government applications, and did not have an official website. It seemed to be at a beginning point in e-administration, as it had concentrated its efforts in the development of particular systems, i.e. GIS-based real property tax administration, and a system for issuing business permits and licenses. However, Antipolo was the only city doing addressing the complex legal and organizational requirements for a clean spatial database by developing an addressing system in their city.

Implications of E-governance

The city governments cited ICT for contributing to accuracy of records, increases in tax collection and other income, and improvements in efficiency, accountability, and transparency. GIS in particular was cited to help reduce the time spent at field work for inspecting property, help reduce time spent in retrieving property records, and helped reduce time and money spent for verifying property characteristics.

A factor that can hold city governments back a bit is that the national government has not yet developed methods for accounting online payments through credit card payments or e-banking. City governments who would like to have online payment schemes would benefit from policies for the security of transactions, from a variety of online payment modes, and

from supporting services from the private sector such as online credit card payments and money transfers from private and corporate Internet bank accounts.

There are high costs to preparing a transactional website. More than website design and hosting, one needs a fully-computerized system for storing data, securing, and retrieving data, data backup storage, and a capability for online access by users. Unless there is a high enough demand for an online payment system, so that a city government will earn enough from online tax payments, then it is not financially rational to provide the service.

Personnel issues such as acquiring staff with training for using and maintaining the various computerized systems, addressing staff turnover of trained personnel, and providing competitive compensation specifically for GIS personnel have also come up.

Individuals have to be coaxed, prodded or pushed into the information age. Digital divide is a real issue here because poor families will not be able to afford the required hardware, connectivity and training to the Internet. Until the general populace is given sufficient experience with computers, e-governance will not happen. As of the time of the study, the four cities did not report any strong pressure from residents and businesses to provide online public service.

Antipolo City has just begun the deployment of computer kiosks linked by a WAN to City Hall. On these kiosks, users can access easy interfaces on touch-screen equipment to read announcements and view maps of different parts of Antipolo. This is a start to increasing familiarity with computers, and the kiosks can be used later for WAN-based rather than Web-based e-governance.

Local governments can provide training on Internet usage for its citizens, and encourage IT education to increase the number of IT-skilled labor. Local governments can also provide scholarships to improve the quality of skills from call center and encoding operations to programming, digital art, and creation of Internet-based services. But beyond this, citizens and business have to have their own initiative to meet with government in virtual space.

Next steps for E-governance

What is missing in the picture are the demands from the business sector and the citizens. Both governance and e-readiness have to be present before e-governance can appear. None of the cities reported any strong demands from the private sector for online transactions, and none of the cities survey its website users for desired web content. This can be connected to the NRI 2003 results where government consistently outranked the business sector and private individuals in terms of networked readiness and usage.

National government may have created the supply of public online resources and prescribed minimum content. The implementation of E.O. 265 and R.A. 8792 may have pulled an on-line presence from national agencies, if only as an emerging web presence. City governments and highly urbanized municipalities do have enough resources for computerization and website development to follow the lead of national agencies. National government may also have to encourage the private sector to develop the necessary online banking and other payment systems to provide secure online support to such transactions.

In conclusion, all four cities are improving their e-administration, and are good examples of the progression from e-administration to e-government. However, the four cities have a long way to go before e-governance can be reached, and reaching e-government

seems to be a big enough of challenge for the time being. Part of this challenge is encouraging their clients in the business sector and among citizens to meet online.

Policy Recommendations The following are the recommendations on how to improve e-governance in Philippine cities based on the study's assessment of the four cities as well as the past IT assessments. These recommendations push for a finer definition of the e-governance policy problem.

Connect Websites and Information Systems to Improving E-administration

The current efforts to implement E.O. 265 have failed to emphasize the importance of e-administration. The government is currently using web presence as an indicator of compliance with R.A. 8792 and with international e-readiness demands, but it does not have a way of really examining what is behind the website. MC 2002-01 and MC 2003-01 from the National Computer Center has guidelines on the minimum components of a website, corresponding to UN-ASPA's first three out of promotes five stages of e-government showing increasing degrees of interactivity between a public website and the citizen who will browse it.

The amended guidelines for strategic planning for information systems to support the push for on-line public service came afterwards as MC 2003-02. The template for the ISSP has the agency enumerating personnel, hardware and software, and detailing system architecture. The guidelines do not contain, however, measures for assessing the impact of the information systems. No time-and-motion standards, no measures of impacts upon the

speed of doing business with government, no measures of public satisfaction were mentioned.

Of the four cities in the study, Muntinlupa demonstrated the highest scores in terms of equipment and infrastructure. However, the overall assessment of the four cities showed that Caloocan and Muntinlupa are close to each other because of the large number of e-government applications. Thus, the presence or lack of equipment and infrastructure are not a main determinant of the number and quality of e-government applications that can be generated by the city.

Rather than assessing the performance and impacts of ICT investment in isolation from the organizational context, it is recommended that a system be developed for connecting ICT to performance measurement systems. Existing performance management systems such as the Minimum Basic Needs survey or similar community-based surveys of the Department of Social Welfare, the Local Development Administration Measurement System begun by the Development Academy of the Philippines, the Philippine Cities Competitiveness Ranking of the Asian Institute of Management are possible starting points.

City governments should develop their information policy

City governments will also have to assure the public of the high quality of its data. It will have to recognize that incomplete, inaccurate and late data and information are potentially dangerous. Poor data and information can have costly outcomes for the city's clients, whereas excellent data and information will be willingly bought by clients.

A policy document will be needed to address at least the following concerns:[16]

[16] Milner (2000), *Managing Information and Knowledge in the Public Sector*.

- Require clear protocols on data gathering and presentation, emphasizing consistency and accuracy of the process, and timeliness of the availability of the data and information to clients.

- Specify who can see which data, which person is responsible and accountable for data that has been added to a database, data editing, and data deletion. Accountability should include punishment for unauthorized access to a database, and unauthorized operations of data entry, editing and deletion.

Such a policy document should be linked to the national policy on information to establish clear lines of accountability for data quality and maintenance. This is a major requirement, although a bigger survey is needed to assess what the major components the policy should contain.

Institute a system for identifying, anticipating and preventing problems and failures in local ICT investments

The experience in the United States is that operational and management problems related to information technology exist in federal, state and local governments. The documentation by the U.S. General Accounting Office shows the same problems appear regularly, but there is difficulty to conduct a systematic study of such cases due to a reluctance of public organizations to reveal their failures (Rocheleau, 2000).

This study was only able to describe the factors that respondents cited. There is still a need to trace how problems emerge, and how the city governments are able to resolve problems associated with computerization and other ICT use.

Expectations on how ICT can improve the efficiency/effectiveness, accountability and transparency of the activities of local governments should be clearly identified.

Furthermore, assessments must be based on a system of measurable indicators. Unfortunately, basic research is needed on defining successful and unsuccessful acquisitions of ICT, on defining reasonable periods for developing ICT applications, and for defining appropriate phases or sequences of expenditure for ICT components (analyses of workflow, systems, training needs, change management, data maintenance needs, and after-purchases support; setting data standards and service quality standards; purchase of data, software, hardware).

Annex 1: Government Information System Plan

EXECUTIVE ORDER NO. 265 APPROVING AND ADOPTING THE GOVERNMENT INFORMATION SYSTEMS PLAN (GISP) AS FRAMEWORK AND GUIDE FOR ALL COMPUTERIZATION EFFORTS IN GOVERNMENT

WHEREAS, the government is committed to carry out, in pursuance of "Angat Pinoy 2004", or the Medium-Term Philippine Development Plan, 1999-2004, wide-ranging administrative reforms to enhance government efficiency and effectiveness in government operations and in the delivery of basic services to the public;

WHEREAS, these reforms are being pursued particularly in fiscal and financial management, procurement, education and manpower development, personnel welfare, organizational effectiveness, and service delivery;

WHEREAS, the wider use and application of information and communications technology offer tremendous opportunities for government to ensure the success of these reforms;

WHEREAS, the National Information Technology Council (NITC), the policy advisory body on information and communications technology in the country, has formulated, in close consultation with concerned government agencies, the private sector, local government units, academe, and members of Congress, and accordingly endorsed a government information systems plan that will serve as blueprint for the computerization of vital government operations and key front-line services for more effective governance;

WHEREAS, the NITC and the Electronic Commerce Promotion Council, created pursuant to Executive Order 468, dated 23 February 1998, have been merged into the Information Technology and Electronic Commerce Council (ITECC);

NOW, THEREFORE, I, JOSEPH EJERCITO ESTRADA, President of the Philippines, by virtue of the powers vested in me by law, do hereby order as follows:

Section 1. Approval of the GISP. The Government Information Systems Plan (GISP), also to be known as "Philippine Government Online" hereto attached, is hereby approved and adopted as framework and guide for the computerization of key frontline and common services and operations of the government to enhance overall governance and improve the efficiency and effectiveness of the bureaucracy.

Section 2. GISP Implementation. To ensure the full and effective implementation of the GISP, all government agencies and instrumentalities, including local government units, shall align their respective computerization projects with the priorities identified in the GISP. The ITECC shall prepare a consolidated annual program of expenditures for government computerization, which shall become part of the President's Annual Expenditure Program for submission to Congress.

Section 3. Implementing Rules and Regulations. ITECC shall issue such guidelines as may be necessary to implement this Executive Order.

Section 4. Repealing Clause. All orders, directives, issuances, resolutions, rules and regulations or parts thereof that are inconsistent with the provisions of this Executive Order are hereby repealed or modified accordingly.

Section 5. Effectivity. This Executive Order shall take effect immediately.

DONE in the City of Manila this ---12th day of July, in the year of our Lord Two Thousand.

JOSEPH EJERCITO ESTRADA

President of the Philippines

Excerpts from the GISP:

Chapter 2 Vision and Development Framework

A. Vision

Consistent with the national vision and objectives set forth in the Medium-Term Philippine Development Plan or Angat Pinoy 2004, government shall harness the full potentials of information and communications technology (ICT) to ensure wider public access to information and the faster and more efficient delivery of government services to the public.

Once the Philippine government goes online, Filipino citizens anywhere in the country and in other shores, as well as current and potential foreign investors anywhere in the world, will have electronic access to government information and services.

To realize this vision, the following shall be the specific goals to guide the implementation of the GISP:

Within five years after approval of the GISP, the government shall have put in place the enabling environment, the policies, and the appropriate institutional structures to allow the full and unhampered implementation of the GISP. Government agencies shall have reengineered pertinent business processes and embarked on the automation of their frontline services and housekeeping systems. Given this enabling environment, the private sector shall have built up its capacity and put up the organization and investments required to respond adequately to the challenge of providing quality ICT services to the government.

Within the first decade of the 21st century, every Filipino, every organization, and every foreign investor and visitor, shall have online access to government information and services in their homes, in community or municipal centers, in foreign posts, in public libraries and kiosks, and in government offices.

Within the first decade of the 21st century, the application of information technology in government operations shall have improved governance with the following key indicators of success:

- Faster and simpler processing of licenses, permits, and certifications;
- Expanded and more convenient access to more and better quality information and services;
- Efficient planning, generation, and management of government resources, in the process adding value to every taxpayer's peso, reducing waste, and eliminating opportunities for graft and corruption; and

- Highly developed and more responsive public sector organizations with better-informed decision-making, highly transparent and accountable operations, and goal-driven instead of task-driven government employees.

B. Goals and Objectives

The GISP seeks to realize a system of governance that will lead to:

- Faster and better delivery of public goods and services;
- Greater transparency in government operations;
- Increased capacities of public sector organizations; and
- Proactive participation of citizens in governance.

These are in support of the broader national development goals as follows:

- A globally competitive economy;
- Accelerated development of human resources and eradication of poverty;
- Equitable spatial distribution of development, economic activity, and population;
- Sustainable development of natural resources;
- Improved peace and order; and
- More effective governance.

These shall be realized through the establishment of an electronic bureaucracy that will link government institutions with one another, with the public, and with private sector institutions.

1. Information Systems Solutions

Government shall harness ICT in developing solutions that directly address and support the country's development goals.

1.1 Globally Competitive Economy

Objective

- To promote the efficient operation of markets, particularly in the following areas:
- Providing information on business opportunities, credit and technical assistance, sources of materials and information, and linkages;
- Developing sound economic policies and strategies, and monitoring and assessing their performance;
- Formulating and enforcing appropriate rules and regulation; and
- Promoting electronic commerce.

1.2 Accelerated Development of Human Resources and Eradication of Poverty

Objective

- To improve the management of social services, particularly in the following areas:
- Upgrading information support so that government can better formulate, implement, and assess policies in education, health, welfare, and labor policy, as well as plan and manage poverty eradication programs more effectively;
- Achieving faster, more efficient, and more responsive social services particularly to the poor, the elderly, the handicapped, the disadvantaged, and victims of disasters; and

- Facilitate access to information on public services, employment and livelihood opportunities, health and welfare services, credit and assistance, and distance education and training.

1.3 More Equitable Spatial Distribution of Economic Development, Economic Activity and Population

Objective

- To decentralize decision-making, production and delivery of public services, and enforcement of regulations across the country thereby allowing proximate, equal, and convenient access by citizens and organizations.

1.4 Sustainable Development of Natural Resources

Objective

To promote sustainable use of the country's natural resources, particularly in the following areas:

- Improving the system of gathering, processing, storage, and retrieval of information on the country's natural resources; and
- Upgrading government's capacity to manage the ownership and utilization of those resources.

1.5 Improved Peace and Order

Objective

To build on and support the implementation of the National Crime Information System (NCIS), focusing on systems that enhance government's capacity to prevent crimes, track down criminals, monitor criminality, and administer justice.

1.6 More Effective Governance

Objective

- To improve agency capacity for administration, particularly in the following areas:
- Managing public sector physical, financial, and human resources;
- Promoting transparency and public accountability and reducing graft and corruption;
- Creating customer feedback mechanisms;
- Improving coordination between and among agencies and employees;
- Upgrading the quality and speed of managerial decision-making; and
- Establishing of an environment conducive to continuous education and advancement of public sector organizations.

2. Technologies

Government shall promote the design, development, and adoption of cost-effective technologies.

2.1 ICT Infrastructure

Objective

To establish the appropriate infrastructure, in particular the telecommunication networks, hardware and software, and information systems and procedures in accordance with the following electronic governance principles:

- Easy access — Geographically proximate access to information and services by the public and the provision of online query/guide;
- Reengineered processes — Shorter processing time, "less paper" requirements, nonrepetitive processes and input requirements, simpler compliance and evaluation procedures;
- Networked systems — Local, regional, interagency and public-private networking of related systems and processes;
- One-stop/nonstop shops or windows — For permits, licenses, business and other frontline transactions and services;
- Customer-driven service — Systems that can evolve and keep up with the changing requirements of government customers;
- Privacy protection and security — Protection of the right to privacy and institution of measures to ensure security of access to and processing of information at all levels; and
- Compliance with laws and standards — Compliance by all systems, procedures, input and output requirements with the provisions of pertinent laws, government policies, rules, and regulations, and adaptability of the systems to the changing legal parameters of government.

2.2 Interconnectivity

Objective

To adopt interconnectivity solutions, plans, strategies, and systems that will successfully interconnect the various government agencies with one another and with the public. To this end, the following shall be established:

- Electronic collaborative support system operations that share basic resources, equipment, and other ICT facilities;
- Intergovernmental sharing of databases and exchange of information to eliminate duplication of functions and redundancies, and ensure responsiveness in reporting, coordination, cooperation, monitoring and service delivery, among other functions; and
- Interoperable electronic messaging and communication system for government agencies.

2.3 Adoption of Best Practices

Objective

To identify pilot projects or strategic initiatives that will lead to the adoption and widespread use of electronic governance technologies and principles in government.

3. Enabling Environment

To ensure the smooth and speedy implementation of all programs and projects, the appropriate enabling environment in the government, private sector, and ICT industry will be promoted and supported.

3.1 Policies and Institutions

Objective

To put in place the necessary policies, standards, guidelines, rules and procedures that will speed up establishment of the necessary information systems and ensure their high quality.

To reengineer the organizational setup and clearly define the roles, functions, authorities, and accountabilities at oversight and agency levels in relation to the various aspects of implementation, and provide the needed resources.

3.2 Industry Capacity

Objective

To promote the growth of the local ICT industry, improve its capacity to provide quality services in the development, implementation and maintenance of the various information systems networks to be put in place. This will be pursued through adoption of:

- A set of criteria for private sector participation;
- Procurement policies that allow partnerships, tie-ups, and consolidation of efforts and resources of participating companies and organizations;
- Competition policies that ensure a level playing field between big and small enterprises; and
- Policies that encourage innovation and creation of new products that respond to the unique requirements of government.

C. Development Framework

The government shall implement the GISP in three phases, as follows:

PHASE 1: Setting Up the Enabling Environment

- Formulate and adopt, within five years after GISP approval, policies to establish funding; streamline procurement; provide incentives and guidelines for private sector investment and participation; establish technology standards and benchmarks to ensure interoperability, networkability, and security; and set up systems functionality standards and guidelines that will improve public services, promote efficiency, effectiveness and transparency in government operations, and upgrade public sector management capacities.

- Improve and strengthen, within five years of GISP implementation, existing institutional structures and capacities, including those of the NITC, NCC, DBM, COA, DILG, CSC and implementing agencies and local government units. Such capacity building effort will include, among others, a proper definition and delineation of roles, authority, and accountability, training of users and ICT people in the government, conduct of advocacy and culture change programs, infusion of adequate financial, material and other resources.

- Generate the necessary investments from the private sector, government, and other funding institutions in accordance with the scheduled implementation of the various GISP information systems projects.

PHASE 2: Building the GISP information infrastructure

- Develop, within five years of the GISP implementation, the necessary information and communications technology infrastructure.

- Adopt guidelines on hardware and software platforms in all participating government agencies to ensure compatibility, interoperability, and sharing of applications and to achieve savings through economies of scale.
- Set up shared nationwide telecommunications infrastructure for use by all government agencies. A shared facility will not only reduce total cost to the government, but also allow smaller and/or less sophisticated agencies to benefit from networking and interconnection.
- Accelerate implementation of the Philippine Information Infrastructure (PII) and RPWEB and promote e-commerce and Internet technologies to improve public access to government and make government transactions easier, more convenient, and more transparent.

▪ Identify and prioritize the various systems networks and anchor projects within each systems network.

- Identify, design, and establish crucial databases and data warehouses to improve the following: enforcement of regulations provision of vital information on markets, opportunities, sourcing of raw materials and production inputs, and assistance; managerial decision-making; and policy formulation and assessment.
- Establish priority strategies for GISP project implementation in accordance with resource availability and learning capacities of implementing agencies and their publics.

- Reengineer the various mission-critical and public sector management business processes and develop clear definitions of the functional specifications and technological requirements of the systems network and its building blocks.
    - Review and reengineer business processes to do away with redundancies, duplication, and red tape and to prepare them for automation.
    - Review and reengineer housekeeping processes and establish common functional and workflow standards across the bureaucracy.
    - Clearly define the functional specifications of the various building blocks comprising the information systems network.
- Design, install, and operate the various systems network.
    - Program the installation of the various applications in accordance with the learning and absorptive capacities of the participating government agencies, like transaction processing applications in the first phase, executive decision support systems in the second, and expert systems in the third.

PHASE 3: Sustaining the GISP

- Clearly define ownership and management responsibilities, authorities, and accountabilities for each information system.
- Develop benchmarks and indicators for evaluating overall and individual project performance.

Establish a mechanism for continuing learning and development of the various participating institutions.

Annex 2: Raw Scores of the Cities in the Survey

Table 15. E-governance Survey Scores

E-government Applications	Scoring	Antipolo	Caloocan	Muntinlupa	Tagaytay
Citizen involved in online service development	0 to 3	0	2	0	0
Online voting	0 to 2	0	1	0	0
Online polling on proposed ordinances	0 to 2	0	0	0	0
Subtotal	**7**	**0**	**3**	**0**	**0**

Table 16. E-Government Applications Survey Scores

E-government Applications	Scoring	Antipolo	Caloocan	Muntinlupa	Tagaytay
Online tax forms	0 to 4	0	1	0	1
Online tax filing	0 to 3	0	0	0	1
Online tax payment	0 to 3	0	1	0	1
Online procurement by city	0 to 2	0	0	2	2
Online RFP	0 to 2	0	2	2	0
Business/Professional forms	0 to 3	0	1	0	1
Business/Professional transactions	0 to 3	0	0	0	0
Online business fee payments	0 to 4	0	0	0	0
Citizen involved in online service devt	0 to 3	0	2	0	0
Mobile tech for law enforcement	0 to 2	2	2	2	2
Video confcing for high security comm	0 to 2	0	1	1	2
Support for integrated law enf system	0 to 4	0	0	0	0
Polling place sites online	0 to 2	0	2	2	1
Local candidates	0 to 2	0	2	1	2
Voter education	0 to 2	0	2	1	0
Voting precinct search	0 to 2	0	2	0	0
Online voting	0 to 2	0	1	0	0
Online polling on proposed ordinances	0 to 2	0	0	0	0
Online inquiry of Mayor and response	0 to 3	0	0	1	2
Online inquiry of Council and response	0 to 3	0	0	1	0
Subtotal	**46**	**2**	**16**	**13**	**15**

Table 17. GIS Survey Scores

GIS	Scoring	Antipolo	Caloocan	Muntinlupa	Tagaytay
Have GIS	0 to 2	1	2	0	2
Sharing spatial data	0 to 2	2	2	0	2
Data sources	0 to 3	3	3	0	3
Have secondary GIS use	0 to 12	3	4	0	6
Web mapping	0 to 2	0	2	0	2
Subtotal	**21**	**9**	**13**	**0**	**15**

Table 18. Software Usage Scores

Software	Scoring	Antipolo	Caloocan	Muntinlupa	Tagaytay
Software for Planning	0 to 2	1	1	1	1
Software for Budgeting	0 to 2	1	1	1	1
Software for Accounting	0 to 2	2	1	1	2
Software for Payroll	0 to 2	1	1	1	2
Software for Procurement	0 to 2	0	1	1	1
Software for Inventory	0 to 2	0	0	1	0
Software for LUP	0 to 2	1	1	0	1
Software for Civil Registry	0 to 2	2	2	2	2
Software for Permits	0 to 2	2	2	1	2
Software for Licenses	0 to 2	2	2	1	2
Software for Business Tax	0 to 2	2	2	1	2
Software for RPT	0 to 2	2	2	1	2
Software for Health	0 to 2	0	0	0	0
Software for Social Welfare	0 to 2	0	0	1	0
Software for Education	0 to 2	0	0	0	0
Software for Employment	0 to 2	0	0	2	0
Software for Crime Prevention	0 to 2	0	2	0	0
Subtotal	**34**	**16**	**18**	**15**	**18**

Table 19. Website Survey Scores

Website	Scoring	Antipolo	Caloocan	Muntinlupa	Tagaytay
Age	0 to 4	0	3	2	3
Update schedule	0 to 5	0	1	4	2
Promotion	0 to 1	0	1	1	1
Citizen response	0 to 3	2	0	3	0
Specialized databases	0 to 1	0	1	0	0
Stage of Web presence	0 to 5	0	1	1	1
Subtotal	**19**	**2**	**7**	**11**	**7**

Table 20. ICT and Management Survey Scores

ICT and Management	Scoring	Antipolo	Caloocan	Muntinlupa	Tagaytay
Access to Internet	0 to 3	1	0	2	1
Access to email	0 to 2	1	0	2	1
Internet use policy	0 to 2	1	0	1	0
Email use policy	0 to 2	1	1	1	0
CIO	0 to 3	1	2	2	3
Software budget	0 to 2	0	0	0	0
Software license renewal budget	0 to 2	0	0	0	1
Hardware budget	0 to 2	0	2	2	1
Hardware maintenance budget	0 to 2	2	2	0	1
Info system design budget	0 to 2	0	2	0	1
Info system maintenance budget	0 to 2	2	2	0	1
GIS design budget	0 to 2	0	0	0	1
GIS maintenance budget	0 to 2	2	2	0	1
IT training budget	0 to 2	0	2	1	0
Internet access budget	0 to 2	1	2	1	1
Website design budget	0 to 2	0	2	0	1
Website maintenance budget	0 to 2	0	0	0	1
Website hosting budget	0 to 2	0	0	0	1
Technical assistance	0 to 3	2	2	3	2
Subtotal	**41**	**14**	**21**	**15**	**18**

Table 21. GISP Survey Scores

GISP	Scoring	Antipolo	Caloocan	Muntinlupa	Tagaytay
GISP Phase	0 to 3	2	3	3	3
Information sought is on website?	0 to 2	0	1	0	1
Job vacancy posting	0 to 2	0	0	2	1
Public and private job info	0 to 3	0	0	2	0
Online job application	0 to 3	0	0	2	0
Subtotal	**13**	**2**	**4**	**9**	**5**

Table 22. ICT Equipment and Infrastructure Survey Scores

ICT Equipment & Infrastructure	Scoring	Antipolo	Caloocan	Muntinlupa	Tagaytay
Desktop	0 to 4	4	3	4	3
Laptop	0 to 4	1	1	1	1
Minicomputer	0 to 4	0	0	0	0
Printer	0 to 4	3	3	4	2
Plotter	0 to 4	1	1	1	1
Scanner	0 to 4	2	2	2	2
Digitizer	0 to 4	1	1	1	0
Modem	0 to 4	1	2	4	2
Hub	0 to 4	1	2	2	1
Multimedia projector	0 to 4	0	1	1	1
WAN	0 to 2	0	2	1	0
Intranet	0 to 2	2	1	2	0
Intranet for news & info	0 to 2	0	0	2	0
Intranet for docs & manuals	0 to 2	0	0	1	0
Intranet for internal recruitment	0 to 2	0	0	2	0
Intranet for employee benefit forms	0 to 2	0	0	1	0
Intranet for online report generation	0 to 2	0	0	2	0
Intranet for online procurement	0 to 2	0	0	1	0
Intranet for team collaboration	0 to 2	0	0	2	0
Intranet staff access to data/info	0 to 2	1	0	2	0
Intranet for online training	0 to 2	0	0	1	0
Subtotal	**62**	**17**	**19**	**37**	**13**

Scoring

The answers to the survey were scored using a scale applicable to each question. The scale ranges from 0 (none) to a larger number in increasing levels of desirability for e-governance. Each city has a score that can be compared with the maximum possible score. The closer a city is to the maximum score, the better is its use of ICT to achieve the goals of good governance

1. Questions on having a system, application, online service, etc. have two to four ranges:
   - 0 = none, and 1 = have
   - 0 = none, 1 = plan to acquire in the future, and 2 = have
   - 0 = none, 1 = plan to acquire in the future, 2 = have equivalent, and 3 = have
2. Questions on specific budgets and specific applications were scored as 1 point per item the city had.
3. Questions on spatial data sources had four ranges:
   - 0 = none, 1 = secondary data, analog, 2 = secondary data, digital, and 3 = primary data
4. Questions on extent (e.g. of access to Internet/email, or availability of online forms, of acquisition of equipment) fell into ranges specified by each question:
   - Internet access: 0 = none, 1 = some offices have 1 terminal each, 2 = every office has at least one terminal, and 3 = every employee has Internet access
   - forms available online: 0 = none, 1 = 25% or less, 2 = 26 to 50%, 3 = 51 to 75%, and 4 = 76% or more
   - number of desktop computers: 0 = none, 1 = 1 to 5 pieces, 2 = 6 to 20, 3 = 21 to 50, and 4 = more than 50 units.

This scoring method allowed for basic comparisons of the accomplishments each city had towards e-governance.

The Start of an Index

A second analysis was performed. The scores per category was indexed to specific maximum scores. E-government and E-administration categories were given higher index scores of 100 each. ICT Management and Equipment/Infrastructure were given lower index scores of 50 each. The difference is made to reflect that Management and Equipment/Infrastructure are just basic requirements. The indexed scores are shown in the following table:

Table 23. Comparison of Indexed Scores of the Four Cities by Category[17]

Category	Max. Score	Index	Factor	Antipolo	Caloocan	Muntinlupa	Tagaytay
E-governance	7	50	7.14	0	21.43	0	0
E-government	59	100	1.69	6.78	33.9	37.29	33.9
E-administration	55	75	1.36	34.09	42.27	20.45	45
ICT Management	60	100	1.67	26.67	46.67	43.33	41
ICT Equipment/Infra	62	75	1.21	20.56	22.98	44.76	15.73
TOTAL	**243**	**400**	**n.a.**	**88.1**	**167.25**	**145.83**	**135.62**

After the scores were multiplied by the factors, there is a shifting in the ranks for second and third between Muntinlupa and Tagaytay. This is largely due to the lower index score for ICT Equipment and Infrastructure that minimized the input of the raw scores, the aspect on which Muntinlupa scored the highest.

The index seems to provide a finer differentiation of the characteristics of each city. The E-administration initiatives that must form the systematization of the processes and records keeping of a city government contribute to the greater part of the indexed scores of Antipolo, Caloocan and Tagaytay. The E-government score of Muntinlupa has become the

[17] Figures are rounded off; totals therefore do not seem to tally with table entries.

major input for its indexed score, and the input of ICT Equipment and Infrastructure has been greatly minimized.

The format can be used to evaluate e-governance efforts along priorities set by the evaluating agency, whether local governments themselves or national government or donor agencies. For example, if an evaluating agency were to give less importance to the aspect of e-administration, then its index could be set to 75 instead of 100. In turn, the factor would change and the changes in the indexed score per city would follow:

E-administration	55	75	1.82	34.09	42.27	20.45	45
TOTAL	**238**	**275**	**n.a.**	**72.37**	**119.5**	**108.6**	**109.9**

There is no literature that definitively suggests a prioritization among the four aspects. However, this author strongly recommends that the path shown in the framework would the basis of prioritization (please refer to the framework).

Annex 3: UN-ASPA Five Stages of e-government

STAGE	UN-ASPA Stage Description	Specific Characteristics / Features to look for
Stage One	Emerging Web Presence ▪ Sites serve as a public information source ▪ Static information on the government is provided ▪ FAQs may be found ▪ Contact information is provided	▪ Telephone numbers ▪ Postal address ▪ Email address ▪ Services offered ▪ Mandate, organizational structure, FAQs, related RAs
Stage Two	Enhanced Web Presence ▪ Access to specific information that is regularly updated ▪ A central government homepage may act as a portal to other department sites ▪ Useful documents may be downloaded or ordered online ▪ Search features, e-mail and areas for comments are accessible	▪ Updated in the past 1.5 months ▪ Forms are available (html, word, sometimes zip, pdf) ▪ Search function/ Site map ▪ Message board/ Feedback form ▪ Newsletters or publications/ Purchase information
Stage Three	Interactive Web Presence ▪ A national government websites frequently acts as a portal ▪ Users can search specialized databases ▪ Forms can be downloaded and/ or submitted online ▪ Secure sites and passwords begin to emerge	▪ Downloadable forms (pdf, zip) ▪ Specialized databases ▪ On-line forms submission ▪ Interactive elements e.g. Chatroom/ Forum/ Discussion boards ▪ User log-in and password (internal use or public)
Stage Four	Transactional Web Presence ▪ Users will be able to conduct complete and secure transactions online ▪ The government website will allow users to customize a portal in order to directly access services based on specific needs and priorities ▪ Sites will be ultimately secure	▪ Public use log-in and password (NOT exclusive for internal use) ▪ Secure ▪ On-line payment ▪ Confirmation of request (e-mail confirmation/ acknowledgment receipt) ▪ Display of security and privacy policy
Stage Five	Fully Integrated Web Presence ▪ Country provides all services and links through a single portals ▪ No defined demarcation between various agencies and departments ▪ All transactional services offered by government will be available online	▪ All department information and services may be accessed through the department portal ▪ Cohesive interface covering all attached agencies, concerned agencies and all services ▪ Frontline services are fully-transactional online ▪ User may customize his department portal page ▪ Search engine encompasses attached websites

Annex 4: Survey of Websites of the Four Cities

Antipolo City	URL: www.antipolocity.com
Caloocan City	URL: www.caloocan.net
Muntinlupa City	URL: www.muntinlupacity.gov.ph
Tagaytay City	URL: www.tagaytay-city.org

The contents of the websites of the four cities were inventoried[18] in February 2004. The contents were analyzed using the UN-ASPA "Five Stages of E-government"[19]. Each type of content was marked as 0 or 1: 0 = absent, 1 = present. None of the websites showed any features consistent with the fifth Fully-Integrated stage.

Table 24. Features of City Websites, Emerging Stage

EMERGING	Antipolo	Caloocan	Muntinlupa	Tagaytay	TOTAL
Agency name	1	1	1	1	**4**
Agency logo		1	1	1	**3**
Write up/history	1	1	1	1	**4**
Organization structure		1	1		**2**
Key Officials		1		1	**2**
Plans		1			**1**
Projects		1			**1**
Rules & regulations			1		**1**
Services			1	1	**2**
Reports		1		1	**2**
Statistical information		1	1		**2**
Tourist information	1	1	1	1	**4**
Business/investor information		1			**1**
Postal address		1			**1**

[18] Antipolo's website was included even though it is not an official website, mainly because the city government recognizes it as their website until the time they put up an official website.

[19] This framework was utilized because it is the standard set by the NCC.

E-mail address		1			**1**
Telephone numbers	1	1		1	**3**
TOTAL	**4**	**14**	**8**	**8**	**34**

Table 25. Features of City Websites, Enhanced Stage

ENHANCED	Antipolo	Caloocan	Muntinlupa	Tagaytay	**TOTAL**
Accessible information	1	1	1	1	**4**
Updated monthly	1		1	1	**3**
Downloadable Forms			1	1	**2**
Downloadable Publications	1			1	**2**
Downloadable Newsletters		1		1	**2**
Announcements				1	**1**
Search features	1		1		**2**
Site map	1		1		**2**
Feedback form	1		1		**2**
TOTAL	**6**	**2**	**6**	**6**	**20**

Table 26. Features of City Websites, Interactive Stage

INTERACTIVE	**Antipolo**	**Caloocan**	**Muntinlupa**	**Tagaytay**	**TOTAL**
User log-in			1	1	**2**
Online forum (chat room)	1				**1**
TOTAL	**1**	**0**	**1**	**1**	**3**

Table 27. Features of City Websites, Transactional Stage

TRANSACTIONAL	**Antipolo**	**Caloocan**	**Muntinlupa**	**Tagaytay**	**TOTAL**
Public User Log in and Password	1		1		**2**
TOTAL	**1**	**0**	**1**	**0**	**2**

Muntinlupa City's website has much content useful for its own citizens, such as forms for permits and licenses. Tagaytay City's website is catered mostly to tourists, which is a

good focus given Tagaytay's appeal as a major tourist site of the country. Caloocan City has content more of interest to investors, including top 100 companies in Caloocan, completed and planned projects, infrastructure and available public services. Although Antipolo City's website is privately managed, it has more interactive and search capabilities and creates a feeling of community more effectively. The other three websites tend to be, in this author's opinion, reflective of what the city government thinks its audience wants to read. Website content should really involve much research into the content its audience wants.

Annex 5: Interview Respondents

ANTIPOLO CITY

Paul Michael Manuel
Computer Programmer III
Assessor's Office

Architect Cesar B. Reyes
City Assessor
Assessor's Office
Landline: 697-0316

Ronald Zapanta (Website Administrator)
Administrative Officer
Office of the Vice Mayor
Landline: 697-6283/697-4384

CALOOCAN CITY

Marco Cancino
Information Technology Group, OIC
Assistant GIS Administrator
Landline: 323-5312
Fax (Mayor's Office): 361-5716
email: chicken1081@yahoo.com

MUNTINLUPA CITY

Jaime A. Ventura
Head, Personnel Department
Landline: 543-0728
Fax: 862-5316

Jonnah O. Hidalgo
Head, Management Information Systems
Telefax: 543-0775

TAGAYTAY CITY

Alex Mendoza
Records Officer III
City Assessor's Office
EDP- OIC
email: alexmendoza@tagaytay-city.org

Alex Baybay
City Assessor's Office

Reynaldo T. Bayot
Real Property Appraiser I
Landline: (046) 413-1089
Fax (Mayor's office): (046) 860-0593

AMELLAR CORPORATION

Rachelle Borja, Ria Bendaña, Jessa Dublas
Amellar Corporation
#46 April St.
Congressional Village
Quezon City
Landline: 925-2319

Annex 6: GTI Indicators

1. **Knowledge Jobs –** knowledge and information-based jobs, usually IT- or engineering based, requiring higher skills training. The indicators used are
   - **Qualified engineers** : The availability of engineers in a country's labor market.
   - **Availability of IT skills**: The availability of qualified information technology workers in a country's labor market.
   - **Availability of senior management**: The availability of competent senior managers in a country's labor market.
   - **Higher Education enrollment**: Net enrollment in public and private higher education institutions for persons aged 17-34.
2. **Globalization –** a country must shift its scope from competition in a national economy to competition in a global economy. The assumption of the index is that countries must reduce economic and trade barriers, support technological innovation towards new enterprises, and sell products and services to a global market. The indicators defined for globalization are:
   - **Exports of goods**
   - **Exports of commercial services**
   - **Direct investment flows abroad**
   - **Direct investment in stocks abroad**
   - **Protectionism**: the degree to which national protectionism prevents foreign products and services from being imported (rated on a scale of 1 to 10)

3. **Economic Dynamism and Competition –** competition will be the ability of companies to apply technological innovation in order to create the new products and services, and the speed of marketing these products and services. IT companies will have to be dynamic, entrepreneurial, fast, and adaptable. The indicators are:

   - **Overall productivity:** GDP per person employed
   - **Worker motivation:** Employee identification with company objectives (rated on a scale of 1 to 10)
   - **Adaptability:** Companies' ability to adapt quickly to changes in the market (rated on a scale of 1 to 10)
   - **Entrepreneurship:** Company management's sense of entrepreneurship (rated on a scale of 1 to 10)
   - **Ability to self-finance:** The degree to which a company generates enough cash flow to self-finance their investments (rated on a scale of 1 to 10)
   - **Venture capital:** The availability of venture capital for business development (rated on a scale of 1 to 10)

4. **Transformation to a Digital Economy –** instead of deals made face-to-face, exchanges of physical goods and paper trails, the Next generation economy has virtual relationships, transactions and even exchanges. The indicators are:

   - **Internet Users:** Number of Internet users per 1000 people
   - **Electronic commerce**: The degree to which electronic commerce is being developed
   - **Investment in telecommunications** : Average percentage of GDP

- **Computers per capita**: Number of computers per 1000 people
- **Computer power per capita**: MIPS (millions of instructions per second) per 1000 people

5. **Technological Innovation Capacity –** In addition to the old considerations of labor, capital, and production inputs, the Next Generation economy also considers increases in knowledge.[20] The indicators are:
   - **Number of patents issued**: Average annual number of patents granted to residents of a country
   - **Total expenditure on R & D**
   - **Total R & D personnel nationwide**
   - **Total R & D expenditures per capita**
   - **Total R & D personnel per capita**

[20] This factor echoes the concept of endogenous growth, where the growth unexplained by GNP is explained by long-run equilibrium factors, so that growth is expressed simply as $Y=AK$, where A is any factor affecting technology. In this equation, R&D expenditures and development of human capital will have a large impact rather than low costs of labor. This explains why poor countries now face greater difficulty competing in the Next Generation, and why Southeast Asian countries with a cultural emphasis on education have potential to compete.

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