GAUTENG
PROVINCIAL
GOVERNMENT

Observing evolution of the information society and e-government in Gauteng province 2010 report

Gauteng Provincial Government

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MEC's Foreword

The set of indicators and policy issues presented here in the first report on Observing Evolution of the Information Society and e-Government in Gauteng province, addresses our need to understand the changing nature of household and business access to infrastructure and government services. Gauteng, South Africa's historically most economically productive province, has benefitted from the availability of infrastructure, including the transport and electricity networks necessary to sustain the relatively high levels of economic productivity. The new network infrastructure of the 21st century, increasingly necessary for business and household transactions, is mobile telecommunications and the Internet. In order to make appropriate economic policy decisions and design strategies to promote economic development, the provincial government needs current data and ongoing observation on various aspects of societal change to inform its decision-making. Thus, the report presents data on household and SME access to and usage of fixed and mobile telecommunications and the Internet. The report also reviews the state of electronic government (e-government) with the aim of highlighting those areas that require greater attention in the future.

Government is often a major funder and financier of large-scale infrastructure development, both with respect to economic infrastructure and to social infrastructure. Government is generally the sole funder of public services, in particular electronic government services. While shifting public services online can bring accessibility and convenience to citizens, the initial financial investments in establishing electronic services can be high, thus government must exercise due care in making investment choices for rolling out electronic services. The availability of up-to-date data assists in the process of making such choices.

This two volume report incorporates an overview of information society and e-government emergence (Volume 1), as well as a monitoring and evaluation framework (Volume 2) which can be utilized and expanded on over time. The data contained in the report and the policy issues raised are of public value, in that the information may be relevant to large and small businesses and to the general public, to researchers and NGOs. It is therefore presented as a contribution to ongoing observation of Gauteng's socio-economic development. The monitoring and evaluation (M&E) framework is presented in the broader context of a national perspective on the importance of planning, M&E and performance improvement. It is expected that those individuals and organizations with an interest in charting the development of South Africa will find this framework useful and will consequently publish their data and analysis.

Mandla Nkomfe
MEC for Finance, Gauteng Provincial Government
22 November, 2010

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List of Abbreviations

BRICS	-	Brazil, Russia, India, China and South Africa
CIO	-	Chief Information Officer
CIVETS	-	Colombia, Indonesia, Vietnam, Egypt, Turkey, South Africa
CoJ	-	City of Johannesburg
DoH	-	Department of Housing
EMM	-	Ekurhuleni Metropolitan Municipality
FIRE	-	Finance, Insurance, Real Estate
ICT	-	Information and Communication Technology
ITU	-	International Telecommunications Union
G2B	-	Government to Business
G2C	-	Government to Citizen
G2E	-	Government to Employee
GCCN	-	Government Common Core Network
GCRO	-	Gauteng City Region Observatory
GDACE	-	Gauteng Department of Agriculture, Conservation and Environment
GEDA	-	Gauteng Economic Development Agency
GEDDS	-	Gauteng Employment, Growth and Development Strategy
GEMS	-	Gauteng Emergency Management Services
GGP	-	Gross Geographic Product
GoL	-	Gauteng Online
GTA	-	Gauteng Tourism Authority
GWEA	-	Government-wide Enterprise Architecture
ICASA	-	Independent Communications Authority of South Africa
IMSP	-	Integrated Systems Master Plan
ISAD	-	Information Society and Development
LAN	-	Local Area Network
MIOS	-	Minimum Information Operability Standards
SARS	-	South African Revenue Services
SAPS	-	South African Police Services
SME	-	Small and Medium Enterprise
SMME	-	Small Medium and Micro Enterprise
SMS	-	Short Message Service
UNCTAD	-	United Nations Conference on Trade and Development
VPN	-	Virtual Private Network
WAN	-	Wide Area Network
WASPs	-	Wireless Applications Service Providers
WSIS	-	World Summit on the Information Society

Executive Summary

This 2010 report titled *Observing evolution of the information society and e-government in Gauteng province* is based on the application of the monitoring and evaluation framework designed under the auspices of the Department of Finance Shared Services Division. It is presented in the form of a Report Card drawing on presentation formats such as the annual development indicators reports prepared by The Presidency and the annual African Statistical Yearbook compiled by the African Development Bank.

The purpose of the Gauteng Information Society and e-Government Report Card is to present a view of the state of evolution of the information society at a particular point in time, in order to inform decision-making and evidence-based policy-making to support the achievement of national and provincial goals. It reviews e-society, e-business (SMEs), e-government; ICT market development; information society leadership, policy and regulation; and ICT-related human resource development.

The report card includes a macro-level analysis to give a view of the adoption and usage of ICT and new media in the economy and society, a meso-level analysis to give a view of the institutional evolution with respect to e-government at the provincial and municipal spheres and a micro-level analysis to reflect on the successes, strengths and weaknesses of selected e-government projects. Collectively, these three views, the macro-, meso- and micro- give an insight into the state of evolution of the information and e-government in Gauteng province in 2010. The central question for this monitoring and evaluation report is: How does the Gauteng province perform on key indicators for information society emergence?

Chapter One provides a brief background to ways of thinking about observing and measuring the information society. Chapter Two presents data and analysis on the current state of evolution of the information society in Gauteng province and points to important policy considerations. Chapters Three and Four give the decision-maker a perspective on e-government and are organised as follows: Chapter Three provides an institutional view, namely a view of five dimensions that constitute a public value scorecard on provincial e-government while Chapter Four provides a project level analysis of the intended benefits of particular e-government initiatives and comments on the effectiveness of project implementation. Chapter Five draws conclusions about specific implications from the 2010 Gauteng Information Society and e-Government report for future policy and strategy.

Policy implications for Gauteng province

Information society leadership requires a strategic shift in its short- and long-term objectives. In order to transform the digital divide (for low and no income households, for low income SMEs and for communities in low revenue municipalities) into a digital economic dividend, the targets for universal access and service should be household computer and broadband access to spur Internet usage for a variety of economic and domestic purposes; and cheap,

competitively-priced mobile call charges to spur high levels of mobile voice and SMS usage. This will push Gauteng and eventually South Africa into an era in which ICT usage becomes the main factor in the next stage of evolution of the information society, an era where users base their usage on what they need to do, rather than on limiting their usage based on lack of affordability. This will further lay the foundation for keeping pace with adoption of constantly emerging new ICTs and new media, such as social networking media (Facebook) and economic facilitation media (LinkedIn) and create opportunities for generating indigenous electronic media platforms.

Household computer, broadband and mobile Internet access for both voice and data presents the foundation infrastructure for the "small production cells of the future". A large proportion of SMEs already operate from home. Given that the global and local economies are predominantly services economies in the 21st century, the opportunities present themselves for households to become small production units or cells, similar to the pre-industrial craft economies. This does not imply that industry, factories and other large institutions will disappear, simply that the household production cell will become an additional economic formation.

Policy implications for Gauteng city-region

The economic linkages between Gauteng province and economic nodes in the surrounding provinces of North-West, Mpumalanga and Free State can become more strongly cemented through ICT connectivity. Hence, electronic commerce solutions for the very large number of small and medium enterprises that form the city-region economy should be encouraged through policy means.

The following features require the attention of decision-makers and it should be noted that the recommendations are complementary:

Macro level, e-society

In theory, the current low level of e-society formation can be addressed through the design of a strategy that facilitates access to high levels of mobile telephony usage, as well as access to a computing device (computer or digital TV set-top box with an interactive send and receive path and browser capability) combined with broadband Internet access for the approximately 60% of the 3.1 million households that have electricity connections but no household Internet access. A strategic approach to household segmentation for the purposes of addressing the digital divide would be to focus first on those households which are sites of SME activity and those households where Gauteng's 1.8 million learners reside. In practice, there may be regulatory obstacles to high levels of access and usage, but this should be remedied in the process of pushing the boundaries of e-development.

Macro level, e-business, SME

In the information society, households may become more than mere units of consumption. They may become small ICT-enabled household production cells (units), providing services and producing knowledge products. SME segmentation suggests that the focus for strategy should be on facilitating access to home-based ICT infrastructure for economic purposes, aimed at the 53-63% of SMEs in BSM[1] categories 3-6 that are doing business from home.

1 BSM = Business Sophistication Segmentation Measure

Macro level, e-government

In the next phase of information society and e-government emergence, the current CIO Council should become the e-Government Council, with ICT support as one of a number of sub-committees. This is because the business of CIOs has become the creation of e-government infrastructure and services, rather than the computerisation of government administration. The e-government programme should identify the most important services for the 60% of households that are not connected to the network, but who do have access to electricity and should derive the "top five services per municipality/ward". This more extensive list of services can then be aggregated into a clustered list of e-services, being an e-services programme for the provincial and municipal spheres of government.

ICT market development

Government cannot build the information society alone. It can contribute to its emergence and seek to address market failure. The difficult question is: How do you determine market failure? One possible approach is to establish a long-term conversation with the private sector in order to facilitate broadband and next-generation infrastructure deployment, while at the same time using a development financing approach to gear further private sector infrastructure investment. In other words, rather than acting as yet another telecommunications operator, government builds broadband infrastructure in such a way that it facilitates/ enables/encourages the private sector to build infrastructure where it would otherwise have considered this to be unprofitable.

Meso-level, e-government public value scorecard

As at June 2010, Gauteng's e-government operations constitute a first-generation e-government programme as envisaged in the e-Government Blueprint 2007. The development of a second-generation e-government programme is required to respond to the changing environment and integrate the e-government strategic priorities into a coherent framework for implementation in a systematic fashion.

Micro-level, e-government benefits realisation

Achieving greater impact and value for money hinges on an explicit commitment to formalising and integrating benefits management into e-government project management, monitoring and evaluation frameworks, methods and practices.

Institutionalising M&E for decision-making in Gauteng

A 30-month implementation cycle for institutionalising the framework is proposed to ensure that policy-makers harvest the benefits of evidence-based policy-making.

Chapter One

Introduction to Gauteng province

Gauteng province, a ZAR823.9 billion economy[2] with a population of 10.45 million people is a small, sub-national geographic region that is evolving as an innovative city-region with respect to its adoption of advanced technologies, including new information and communications technologies (ICT). For some households and firms, this access to ICT has irrevocably changed the nature of social and economic interaction. For many more households and firms, access to ICT is valued, but the cost of access is too high to make a significant impact on lifestyles and livelihoods. And, in the year 2010, some communities, like those in Westonaria on the southern border of the province, are living in a world which comes close to living in"1910 with a mobile phone".

The Gauteng city-region is a larger geographical entity than the province. The indicator system used here has been designed for the Gauteng city-region, though the 2010 Report Card covers only the Gauteng province and does not include the extended boundaries of the city-region, which includes parts of adjoining provinces.

The majority of Gauteng's 3.4 million households (approximately 62%) have an imputed average monthly income of less than ZAR10 000 and six percent of the population, or 626 835 people, are estimated to be living below the poverty line of ZAR283 a month (RSA, 2009: 26). More than 1.5 million people receive social grants, of which more than two-thirds, or more than a million, are children[3]. In 2008/9, there remained 9 622 households with no access to water infrastructure, 11.9% with no access to sanitation and 23% with no access to electricity (ibid: pp. 31-33). These reported 62% of households, including those with limited access to infrastructure, are least likely to be connected to the information society or to be able to access the limited existing range of e-government services.

Gauteng has 1.8 million learners in schooling or 16% of all learners and 16% of all educators, with a learner:educator ratio of 29 (ibid: p. 44). The province has more than 5.5 million people registered to vote in national and provincial elections and more than 4.7 million people registered to vote in local government elections (ibid: pp. 52-53). Contact crime is high in the province (ibid: p. 60) and average life expectancy for men is 57 years and for women is 60 years, probably as a result of HIV/AIDS (ibid: p. 36). These areas of government activity, namely education, voting and crime prevention, are areas where a very large proportion of the population can benefit significantly from access to ICT infrastructure and the introduction of electronic services. Furthermore, access to electronic services such as electronic banking services for SMEs and web-based tourism services for local and international tourists can reduce the cost of these services to the user and contribute to value added in these economic sectors.

Reviews of the extent to which South Africa is in transition to an information society often discuss a national perspective, with little if any presentation of disaggregated data at provincial and municipal levels. The Gauteng government is interested in understanding the state

2 34% of GDP at current prices, see StatsSA GDP 2009 Table 5

3 Child Support Grant and Child Dependency Grant

of the information society and its relationship to socio-economic development in the province, and in particular it wishes to understand the state of electronic government. This will inform government decision-making on future projects, as well as future investments in ICT infrastructure and services. Thus, this information society and e-government report card analyses provincial level data and offers a commentary to this data. Its main limitation is that it does not present data at the municipal level of analysis, because the unit of analysis used was Gauteng province. Municipal level analysis would have required a larger sample size.

Observing and measuring the information society

Information societies are characterised by a number of features including advanced levels of ICT penetration, broadband availability and locally developed electronic content and services; the presence of advanced ICT developer and user skills as a supply side factor in integrating applications into ICT-enabled economic activities; high levels of adoption of mobile communications and the Internet and the emergence of e-business and e-government; and an enabling policy and institutional regime (Melody, 2002).

Developing countries exhibit some, though not all, of these trends, showing relatively limited usage of mobile and Internet-based communications and slow evolution of information technology applications in business and government, creating actual exclusion from the global information society today and even greater potential exclusion in the future (Castells, 1998). While highly industrialised countries have engaged in measuring and understanding the emergence of the information society at national level and across economic regions (ITU, 2010), its emergence in the context of small and medium-sized sub-national regions has not thus far received adequate attention.

Annual ITU reports on *Measuring the Information Society* set their objective as informing policy debate in ITU member states:

"Governments and industry alike need to observe continuously market developments in order to assess their ICT policies and strategies and identify areas that warrant further attention" (ITU, 2010, p. iii).

The ITU reports provide extensive data on 161 countries, including South Africa, and cover background information on recent market developments, as well as data and analysis of items such as the ICT Development Index, the digital divide, the ICT Price Basket and the impact of ICTs on growth and development. While the report and its associated methodologies are useful, a limitation of the ITU approach is that it primarily presents telecommunications indicators, drawing on aggregated data at the national level. Relevant data from the ITU 2010 study are referenced in Chapter Two of this report (ICT Penetration and Market Development) and the design of the indicator system for the Gauteng city-region adopts some of the main premises of the ITU approach, in particular the concept of the digital divide and the theory of the importance of household Internet access.

The indicator system for Gauteng follows the approach of the partnership on *Measuring the Information Society and Development* followed by UNCTAD as it reviews indicators including, but with broader scope than, telecommunications. It is based on the premise that connecting households and firms to information infrastructure, mobile communications and Internet access is as important as connecting households and firms to the electricity grid, because it is the network infrastructure that creates the capacity for connecting those electronic goods that fuel economic production and household consumption. This view is supported by the statement in the most recent ITU information society report (ITU, 2010: p. 81), which argues that household Internet uptake is necessary for achieving the objectives of the World Summit on the Information Society and the Millenium Development Goals. It can be argued, for example, that household access to health information over the Internet can contribute to improving the health of the population, noting that literacy or the availability of content in video and other multi-media presentation formats would be an important factor for real impact to be achieved.

For South Africa, the main locally produced statistics available in the public domain that relates to measuring the information society is the Community Survey 2007, with limited provincial level information provided by the annual General Household Survey for 2009. Other very useful reports are available from local and international research firms and should be used to inform decision-making, though typically they present only national level data. For example, the national Internet population is estimated at 10% (Goldstuck, 2010). South Africa's Community Survey 2007 provides disaggregated data to provincial and municipal level for electronic goods, fixed and mobile telecommunications and the Internet. The Gauteng 2007 survey results report mobile phone usage at 80% across 3.1 million households, with the highest levels of mobile access in the three metropolitan municipalities and the lowest level of mobile access in Westonaria, the least economically developed part of the province, and in the other local municipalities of the West Rand and Sedibeng (StatsSA, 2007: Table GP 12). The 2010 Gauteng Information Society Survey shows an increase in mobile phone penetration to 88% of households. Internet access across Gauteng is estimated at 11%, with only 373 007 households out of 3.1 million having Internet access. Access was highest in the three metropolitan municipalities and very low in the West Rand municipalities of Westonaria, Randfontein and Mogale City (StatsSA, 2007: Table GP 15). The 2010 Gauteng Information Society Survey shows an increase in Internet access to 28%.

The rapid increase in mobile telecommunications and Internet access seen in a three-year period, points to the need for regular monitoring and evaluation, in order to inform decision-making on information society strategy and related public expenditure.

Purpose of the Gauteng Information Society and e-Government Report Card

Mass communications and information-based societies first emerged as a way of thinking about socio-economic development in the 1960s (Schiller, 1969) and the emergence of information societies was increasingly theorised over the next four decades (Bell, 1973 revised 1999; Benkler, 2006; Castells, 1998; Hassan, 2008; Rifkin, 2000, Webster, 1995). It was popularised among national governments at an international series of events between 2002 and 2005 through the activities related to the World Summit on the Information Society (WSIS).

In South Africa, the 2006 ISAD Plan (PNC-ISAD, 2006) aimed to support the following national strategic goals: Broaden participation and increase the competitiveness of the economy; Increase the capacity of government to deliver on its mandate; Celebrate our diversity and promote social inclusion and equality; Entrench democracy and respect for human rights.

The Gauteng Employment, Growth and Development Strategy 2010 (GEGDS) sets the frame for an economy which needs to be innovation-based, environmentally sustainable and inclusive of the majority of the population. Achieving these national and provincial goals will require policy and strategic approaches whereby government continuously fosters and measures the kind of information society that supports these goals.

The ISAD Plan specifies 10 areas of focus necessary for building the information society in South Africa, of which measurement of information society development is the tenth pillar. Other pillars are: policy and regulatory environment; ICT infrastructure and universal access; local content; digital inclusion and e-awareness; human capital; ICT capacity development, research and development; coordination and integration; funding; institutional mechanisms (The PNC on ISAD, 2006, pp. 3-5). The section of the ISAD Plan setting out government's view on measurement of the information society development proposes the formulation of "… an indicator system that supports monitoring, evaluation and impact assessment, development planning, budgeting, forecasting and decision making processes …". Hence, the objective of this information society and e-government report card is to present a picture and analysis of the state of the information society and e-government in the Gauteng city-region in 2010. This picture is based on the indicator system prepared for the Gauteng provincial government that is set out in the *Framework for monitoring and evaluation: Information Society and e-Government in Gauteng*, *2010,* a companion document to the Report Card.

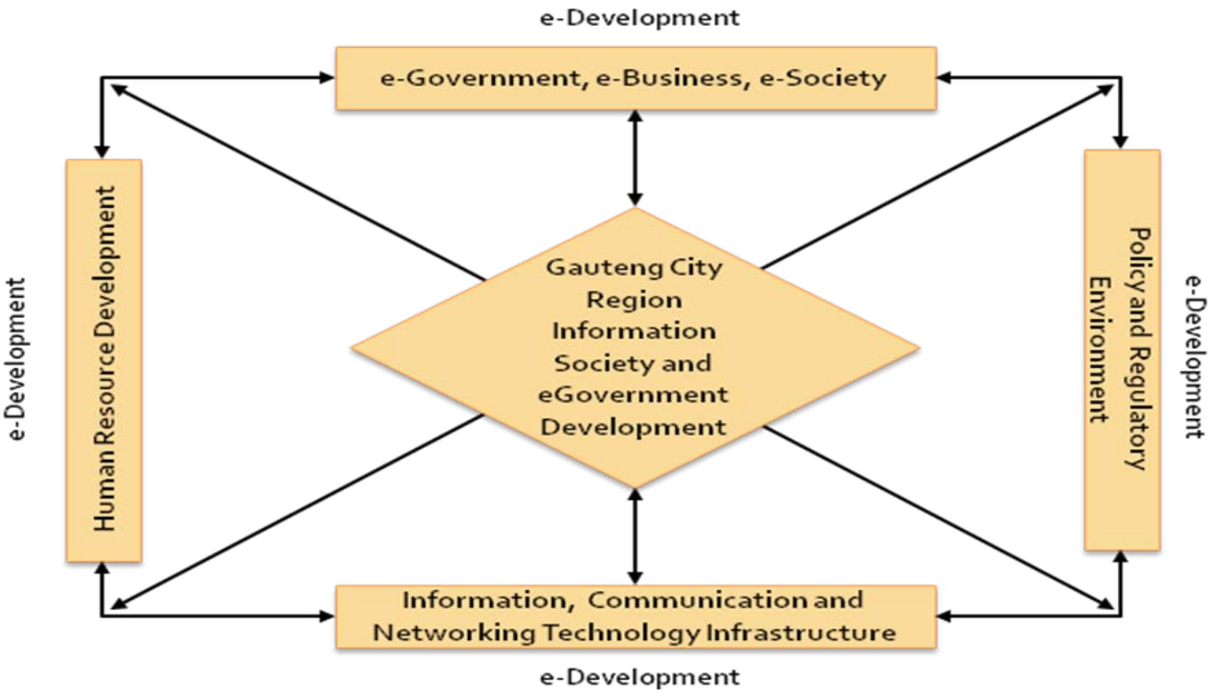
The province of Gauteng is a small sub-national region that shows slow but consistent change towards becoming an information society, where a combination of access to mobile telecommunications and the Internet is enabling households and firms to conduct an increasingly wide range of social and economic transactions using these electronic media. However, few if any studies exist that provide an insight into the level of information society development with respect to government, business and society.

Gauteng has three metropolitan municipalities, which have relatively high levels of ICT diffusion and sophistication. The province hosts the head offices of the main fixed and mobile telecommunications and Internet service providers; and both the private sector and governmental institutions have been making major investments in ICT infrastructure and programmes for well over a decade. Yet the majority of households in even the highly urbanised centres do not have access to ICT at household level. Gauteng also has a large geography of peri-urban towns and informal settlements, in particular in the local municipalities of Emfuleni, Midvaal and Lesedi (south), Nokeng tsa Taemane, Kungwini (north), Mogale City, Randfontein, West Rand and Westonaria (west).

The central question for this monitoring and evaluation report is: how does the Gauteng province perform on key indicators for information society emergence?

Information society evolution can be considered from multiple perspectives, including the strengths and weaknesses in e-government, e-business and e-society and the level of e-development underpinning the above (see Diagram 1). e-development refers to the level of diffusion and sophistication of ICT and ICT-enabled services; the degree of integration of new media in the economic processes of a country or region and in the social activities of its people, as well as the related levels of human resource development and adaptability of the policy and regulatory environment.

Diagram 1: Multiple perspectives on evolution of the information society



Adapted from: Hanna & Qiang, 2010

This Report Card reviews the information society from all four perspectives as they offer an insight into the tangible, as well as the intangible, contributions to development (e-development). It introduces an analysis of information society evolution in the context of the GEGDS perspective on an innovative, environmentally sustainable, inclusive city-region economy.

In so doing, it points to possible comparisons among BRICS countries (Brazil, Russia, India, China, South Africa) and among CIVETS countries (Colombia, Indonesia, Vietnam, Egypt, Turkey, South Africa), though these comparisons are more related to the dynamics of these economies rather than to the particular countries alone. The BRICS countries are large

countries emerging as global powerhouses of innovation and growth, while the CIVET countries are not strangled by debt in the current global recession and have "large, young, growing population(s)…a diverse and dynamic economy…and each, in relative terms, is politically stable" (Financial Times, 2010).

The purpose of the Gauteng Information Society and e-Government Report Card is to present a view of the state of evolution of the information society, at a particular point in time, in order to inform decision-making and evidence-based policy-making to support the achievement of national and provincial goals.

This 2009-2010 study of the state of the information society and e-government in Gauteng presents selected baseline data on e-development. It reports on the results of detailed surveys of SMEs (843 enterprises) and e-society (390 households). It reviews e-government practice including a website assessment and a review of ICT projects in provincial government departments and agencies.

The decision to survey SMEs rather than large enterprises in this first application of the indicators for monitoring and evaluation of ISAD and e-government is based on the view that there is already extensive access to and usage of ICT in large enterprises, while SMEs operate at a disadvantage with respect to their financial resources and organisational capacity to extensively utilise new media. This assumption was tested through the surveys conducted in April and May 2010. This choice should, however, not detract from the necessity for regular surveys to understand the level of e-development in large enterprises, as they are important engines of economic growth and their adoption of new electronic media and applications is a major contributing factor to the evolution of an information society.

The conclusion to the Report Card analyses lessons from the survey with respect to the contribution of government policy and strategy to information society evolution. It considers these lessons with respect to important areas identified for future decision-making and action. With respect to the macro- (societal), meso- (institutional) and micro- (project) level perspectives, the Report Card analysis suggests that there are many ICT-enabled projects in government and the private sector, but little information society focus. The Report Card aims to contribute to thinking about "a more useful concept" of information societies (Skouby, 2002) that is applicable to the particular realities, needs and capacities of Gauteng.

Overview of the Information Society and e-Government Report Card

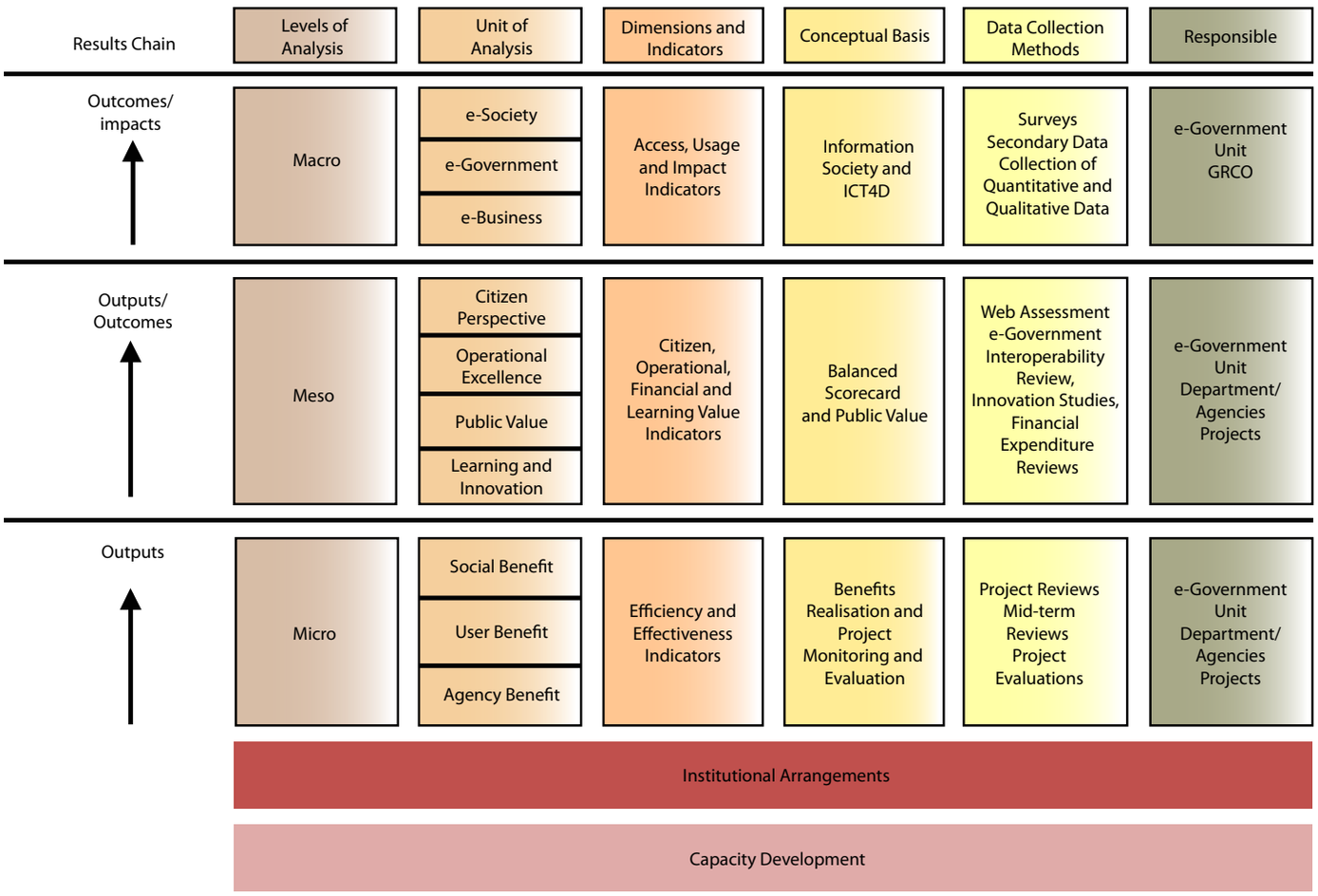
The indicator system has been designed for the Gauteng city-region, though the 2010 Report Card covers only the Gauteng province and does not include the extended boundaries of the city-region, which includes parts of adjoining provinces. The Report Card has three components:

(a) Outputs at the micro level of analysis: understanding particular ICT project outputs with respect to the benefits to users and relevant participating agencies (Chapter Four).

(b) Outputs and outcomes at the meso level of analysis: discussing the citizen and institutional perspective using a "public value scorecard" approach (Chapter Three).

(c) Impact at the macro level of analysis: this is the information society level of analysis and comments on the digital divide within Gauteng's three cities; as well as the digital divide between these cities and the peri-urban geography (Chapter Two).

Diagram 2: Framework for the Information Society and e-Government Report Card



Data collection and analysis should in future years be conducted at both the provincial and municipal levels of analysis, in order to provide for comparative data across the spheres and the forms of government – local, district and metropolitan level analysis.

Chapter Two

Overview: evolution of e-society in Gauteng (macro-level analysis)

Gauteng in the information society: a shift in the existence of a city-region

Gauteng is a part of the world where the fusion of economic strengths and diverse cultures has both enriched and exploited its local population. At the turn of the 21st century, Gauteng is a strong services-based economy, where the services sector contributes 70% to gross geographic product (GGP). Secondary sectors (including manufacturing and construction) contribute 28%, and primary sectors (including mining, resources and agriculture) contribute less than 2%. Gauteng is a centre of innovative activity with respect to all economic sectors, and hosts multiple research institutions in the public and private sectors, as well as six research and teaching universities. All these sectors of socio-economic endeavour are today reliant on new information and communications technologies. A province that was a mining and agricultural province 120 years ago, with manufacturing and services as supporting sectors, has, in the early 21st century, become a services-based economy. In the 21st century, from the foundations of a services-based economy, Gauteng appears poised to move towards becoming an information-based, knowledge-intensive economy. But what is the current state of evolution of the information society?

Mobile telecommunications and Internet-based communication form the basis for all social institutions, firms and households to engage in a world that is defined by the capacity to keep abreast of, and utilise opportunities in, any field. Thus the Gauteng city-region in 2010 is defined by its extensive ICT network capacity, by its rapid adoption of ICT applications including social networking applications, and by the presence of the bulk of the operations of the South Africa-based telecommunications and ICT companies.

The Gauteng economy is a small power-house on the African continent, though its traditional mining and manufacturing sectors are in decline. The services sector has been a major growth sector for more than two decades, fostered by the finance, insurance and real estate (FIRE), retail, tourism and hospitality and the government (provincial and municipal) services sectors. Gauteng provides the foundation for services offered in the province itself, to other provinces in South Africa, to countries in the Southern African region and on the African continent. ICT utilisation is relatively advanced in some of these sectors – in the FIRE sector, new bank Capitec is employing an advanced electronic transactions strategy, while the big four banks (Standard Bank, FNB, ABSA and Nedbank) have pioneered electronic banking for several decades, since the mid-1970s. In the retail, tourism and hospitality sectors, online shopping and bookings are increasing in popularity.

This shift from its existence as an industrialised centre with dependence on physical transport of communications until the 1980s and the transition to a globally-integrated centre networked to other global markets and geo-political centres during the past thirty years, means that the Gauteng city-region is in the early stages of evolution as an information society.

e-Society

This section provides data and analysis on the state of e-society development in the Gauteng city-region and presents a profile of households and individuals with respect to ICT access and usage. It looks at the forms of ICT access, whether fixed or mobile communications, access to the Internet and the purposes to which these technologies are put.

Gauteng survey household and individual profile: household income

The majority of households surveyed, or 55.3%, reported household income of less than R10 000 per month, while 43.8% reported monthly household income of less than R5 000. A smaller proportion of households, or 11.8%, reported income greater than R10 000 per month. Considering the costs of owning or renting a desktop, laptop or palmtop computer, plus the costs of peripherals such as a printer, toner, paper and maintenance, as well as the cost of Internet access, it is inferred that households with income of less than R10 000 per month are less likely to have a computer or Internet access at home than households with an income of more than R10 000 per month.

Policy consideration

Universal Internet access (at home, work and school) should be considered a necessity for effective participation in the information society and should include universal access to broadband. These are complementary forms of access with primary access at the home. Government investment in public Internet access points may dissipate scarce resources with little effect.

Household Profile	Frequency	Percent
Population Group		
African	323	82.8
Coloured	14	3.6
Indian	1	0.3
White	45	11.5
Mixed	7	1.8
Household income range		
Missing data	10	2.6
Refused to answer	67	17.2
Do not know	51	13.1
Less than R500	18	4.6
R501-R2 000	73	18.7
R2 001-R5 000	80	20.5
R5 001-R10 000	45	11.5
R10 001-R20 000	18	4.6
R20 001-R30 000	7	1.8
R30 001-R50 000	9	2.3
More than R50 000	12	3.1

General Household Survey data is now available for 2010.

e-Society: Gauteng survey household and individual profile

Individual: age, education, employment

Analysis

Of the people surveyed, the majority are of working age being between the ages of 25 and 55, while nearly 40% were unemployed, reflecting a very high level of unemployment in the sample population. Only 43% of respondents had completed secondary education and only 15.5% had some form of tertiary qualification.

Policy consideration

Formulating new approaches to universal access to the Internet and broadband should be built on an understanding of the particular needs of the many households composed of unemployed persons, pensioners, family workers and/or students.

Individual Profile	Frequency	Percent
Age of Respondent in years		
Missing data	2	0.5
Refused to answer	14	3.6
0-16	3	0.8
17-24	46	11.8
25-35	113	29.0
36-45	85	21.8
46-55	68	17.4
55-over	60	15.4
Educational attainment of respondent		
Missing data	6	1.5
Did not complete any	20	5.1
Nursery school	2	0.5
Primary school	41	10.5
Lower secondary (G8-G10)	93	23.8
Upper secondary (G11-12)	168	43.1
Tertiary (non-university)	33	8.5
University	19	4.9
Post-Graduate Degree	8	2.1
Employment status of respondents		
Missing data	6	1.5
Student	24	6.2
Employee	137	35.1
Self-employed	29	7.4
Family worker	5	1.3
Unemployed	154	39.5
Retired / Pensioner	35	9.0
Respondent by population group		
African	327	83.8
Coloured	15	3.8
Indian	1	0.3
White	47	12.1

e-Society: Gauteng survey household and individual profile

1 Electronic household goods

Analysis

The level of availability of electronic goods is generally lower than the availability of other household goods including traditional media such as radio and TV. More than 60% of the survey population owns or has access to household goods and more than 80% of the population has access to traditional media and to basic services (water and electricity). However, less than 20% of the population owns or has access to basic ICT such as a computer, printer, games device or fax machine. A computer can be considered a tool of trade for most professions (teachers, nurses, doctors, engineers, managers, public servants, other) and an essential learning tool for school and university students. Furthermore, general access to information for households including government information and e-services, as well as the capacity for electronic transactions such as banking and email are facilitated by having a computer in the home. The computer has become important for access to a range of applications and services, but affordability is an issue. The market in second-hand computers has been slow to form. This may be due to a number of factors, including the high costs of refurbishing used computers compared to the average household income.

Policy consideration

This raises the policy question of universal service to a computer and the Internet. A once-off grant aimed at a proportion of the approximately 60% of households who have electricity but no computer could leverage a wide range of information-society type development opportunities, including expanding the size of the market for computer maintenance, the size of the ICT-skilled labour market and the capacities for e-learning. Furthermore, such a grant would effectively justify the intended public expenditure on broadband infrastructure. However, the contemplation of such a grant should take into account real demand for computer and Internet access for specific social and local economic development purposes and the grant should not be universal. It is argued that household Internet access, not public access alone, is a driver of information society formation.

Availability of electronic household goods and services	Frequency	Percent
Electricity	325	83.3
Protected water	319	81.8
Television	314	80.5
Radio	313	80.3
Refrigerator	283	72.6
VCR/ DVD	267	68.5
Desktop Computer	75	19.2
Printer	46	11.8
Portable laptop computer	45	11.5
Game Consol	35	9
Scanner	27	6.9
Fax machine	26	6.7
Handheld palmtop computer	9	2.3

e-Society: household and individual ICT access and usage

2 Traditional broadcasting media: individual TV, radio

Analysis

The majority of people surveyed, 80% or more, use traditional broadcasting media, though only 47% of individuals stated that they regularly watch TV and only 42% stated that they regularly listen to radio.

The convergence of traditional broadcasting media and the Internet means that from an information society perspective, household access to a computer and the Internet would imply access to a multi-media facility incorporating access to traditional broadcasting media. Thus, resource constrained households would still have access to traditional broadcast media, even if they have only a computer and Internet access.

Digital TV offers opportunities for interactive communications, if the set-top box offers a return path option. However, South Africa appears to be several years away from widespread digital TV access. Household computer and Internet access is still significantly greater than digital TV access.

Policy consideration

While government should be pushing information society and e-government content via mobile data and Internet channels, it should also begin exploring digital TV as a potential electronic information and service channel.

Traditional electronic media access and usage	Frequency	Percent
TV viewing audience		
Yes, occasionally	140	35.9
Yes, regularly	184	47.2
No	66	16.9
Radio listenership		
Missing data	2	0.5
Yes, occasionally	128	32.8
Yes, regularly	167	42.8
No	93	23.8

e-Society: household and individual ICT access and usage

3 Traditional telecommunications media: fixed and public phone

Analysis

More than 60% of people surveyed have accessed a public telephone in the past six months (before April 2010) though only 33% access a public phone more than once a week. Only 20% of households surveyed have a fixed telephone line, with African households having the lowest rate of fixed line access at 13.9%. Fixed and public phone access data suggest that these are not the main forms of connectivity for Gauteng households and individuals. While fixed and public phones may still be necessary for the next decade, alternative forms of connectivity appear to be replacing the traditional forms of telecommunications. Mobile substitution has taken place in the decade 2001 to 2010, with fixed lines and public phones playing only a complementary role in telecommunications. These traditional telecoms media are largely still in existence because of the relatively higher costs associated with mobile telephony and wireless (mobile) Internet access.

Policy consideration

Working on the assumption that the economy strengthens over the next decade and more households enter the productive economy with small increases in household income, the only remaining barriers to household Internet access and usage will be pricing and quality of service. The provincial and municipal governments should therefore engage in regular, formal policy conversations with national government and in discussions pertaining to the regulatory landscape with ICASA.

Household fixed-line phone access	Frequency		Percent	
Yes	81		20.8	
No	309		79.2	
Household fixed-line access by population group	Yes		No	
	Frequency	Percent	Frequency	Percent
African	45	13.9	278	86.1
Indian	0	0.0	1	100
Coloured	4	28.6	10	71.4
White	29	64.4	16	35.6
Mixed	16	35.6	4	57.1

Public Phone Access	Frequency	Percent
Public phone accessed in last six months		
Yes	241	61.8
No	149	38.2
Regularity of public phone access		
Not applicable	149	38.2
More than once a day	38	9.7
Once a day	23	5.9
More than once a week	69	17.7
Once a week	72	18.5
Once a month	39	10.0
Reasons for accessing a public phone (multiple answers)		
Because it is cheaper	163	41.8
Easier than having to recharge mobile	48	12.3
Do not have a mobile phone	24	6.2
Do not have landline phone at home	17	4.4

e-Society: household and individual ICT access and usage

4 New electronic media: mobile communications and Internet access

Analysis

Access to the electronic implements needed to participate in the information society is generally poor, with access to historical ICTs such as TV and radio being disproportionate to access to new media such as desktop, laptop or palmtop computers and peripherals such as scanners, printers or game consols. It is cheaper to own a mobile phone than most other electronic devices and the value of the mobile phone is potentially great in economic terms.

When mobile access is cross-tabulated with household income, the distribution shows that households with monthly income above R5 001 have 100% mobile cellular telephone access, while households with monthly income between R501 and R5 000 have between 96 and 99% access; and households with monthly income below R500 have approximately 78% access. Thus, there is a mobile access gap mainly in those households where no single member is employed. As regards the distribution of Internet access by monthly household income, only households earning above R20 000 have high levels of access (75% or higher). About a quarter of households with earnings in the ranges R5 001-R10 000 and R10 000-R20 000 have Internet access, though there are anomalies in the data.

Mobile and Internet are the electronic media of the future. Hence, evolution towards an information society implies the development of mobile and Internet media as alternative or complementary channels for services and information traditionally delivered at a government office or service counter. This would be similar to the evolution of electronic banking, which developed multiple electronic channels (ATM, mobile banking, Internet banking) as complementary to the service counter.

Policy consideration

The Gauteng Provincial Government should formulate an active programme for making available all its informational content via mobile and Internet channels. It can construct a "top ten" information directory, complemented by a "top ten" e-services directory that can be carried across both mobile and Internet channels. The criteria for selecting the "top ten" should be (a) information and services that affect a large proportion of the population and (b) e-services that are already mature.

Mobile telecommunications, Internet access	Frequency		Percent	
Mobile cellular telephone				
Yes	370		94.9	
No	20		5.1	
Mobile cellular telephone by population group	**Yes**		**No**	
	Frequency	**Percent**	**Frequency**	**Percent**
African	304	94.1	19	5.9
Indian	1	100	1	7.1
Coloured	13	92.9	0	0
White	45	100	0	0
Mixed	7	100	0	0
Access to the Internet at home				
Yes	53		13.6	
No	337		86.4	
Access to the Internet at home by population group	**Yes**		**No**	
	Frequency	**Percent**	**Frequency**	**Percent**
African	30	9.3	293	90.7
Indian	1	100	0	0
Coloured	3	21.4	11	78.6
White	18	40	27	60
Mixed	1	14.3	6	85.7

e-Society: household and individual ICT access and usage

5 New electronic media: individual mobile telecommunications access and usage

Analysis

The majority of people surveyed own a mobile phone with an active SIM card, though a relatively high percentage, namely 11.5%, owns neither. This is a high level of lack of access for electronic goods that can be obtained second-hand at a low price and for a sim-card or mobile starter pack that can be obtained for approximately R30.

Mobile Telecommunications Access	Frequency	Percent
Mobile phone ownership		
Missing data	1	0.3
Active SIM card and own a mobile phone	342	87.7
Active SIM card and access to a mobile phone	2	0.5
No active SIM card, nor access to a mobile phone	45	11.5
Prepaid or postpaid (contract) phone(s)		
Missing data	4	1.0
Not applicable	45	11.5
Prepaid	308	79.0
Postpaid (contract)	23	5.9
Both (have multiple)	10	2.6

Analysis

Mobile phone usage is predominantly for calls, SMS and buzzing. For the majority of people surveyed, the potential of mobile communications to conduct every day activities such as social networking, banking, email, entertainment and communicating with government (e-government) is still under-exploited.

Mobile Telecommunications Usage	Frequency	Percent
Three most frequent uses of mobile phone (more than one answer)		
Make phone calls	334	85.6
Receive phone calls	332	85.1
Send SMS	171	43.8
Not applicable	144	36.9
Keep time	46	11.8
Receive SMS	37	9.5
Send Beeps, Flashes, Buzzes, Missed Calls or Please Call Me	27	6.9
Social networking (Facebook, etc)	12	3.1
Listen to music	10	2.6
Receive Beeps, Flashes, Buzzes, Missed Calls or Please Call Me	10	2.6
Take photos	8	2.1
Use as a diary	8	2.1
Conduct banking	8	2.1
Send emails	7	1.8
Receive emails	5	1.3
Download music	2	0.5

e-Society: household and individual ICT access and usage

6 New media: individual computer usage

Analysis

Nearly two-thirds of the sample population have never used a computer and more than two-thirds do not use a computer on a regular basis. Of the remaining 30% who regularly use a computer, less than 20% use one every day. The major points of computer usage are at home, at work or at an Internet café. There appears to be limited (if any) use of government-funded public computer and Internet facilities.

Policy consideration

Universal access approaches appear to have had little effect on computer access. Current investments in public Internet access facilities, such as multi-purpose community centres (national government), digital lounges and schools online (provincial government) and computer clubs (private sector) are not reaching the population in any significant way. Hence, policy and strategy to achieve universal access to computers and the Internet should be adapted: either a greater proportion of the provincial budget is required, or alternative approaches to public provisioning are needed, or a combination of budgetary increases and alternative approaches is needed.

Computer Usage	Frequency	Percent
Most recent computer usage		
Missing data	1	0.3
Within the last 6 months	120	30.8
Between 6 months and a year	7	1.8
More than a year ago	32	8.2
Never used one	230	59.0
Regularity of computer usage in the last 6 months		
Missing data	1	0.3
Not applicable	269	69.0
Every day or almost every day	69	17.7
At least once a week (but not every day)	31	7.9
At least once a month (but not every week)	19	4.9
Less than once a month	1	0.3
Place of computer usage in the last 6 months		
Other (specify)	1	0.3
Missing data	1	0.3
Not applicable	269	69.0
At home	65	16.7
Internet café	14	3.6
At place of work (other than home)	27	6.9
At another person's home	6	1.5
At school	2	0.5
At tertiary educational institution	5	1.3

e-Society: household and individual ICT access and usage

7 New media: household Internet access

Analysis

Compared to computer access and usage, an even smaller number of households have access to the Internet. A large proportion of the population with Internet access uses wireless connectivity, which may or may not be operating at broadband speeds. This suggests at least two interpretations: (a) the mobility of users influences their choice of connectivity and (b) wireless connectivity is affordable for the majority of the relatively small population of Internet users. It can further be inferred that broadband has not yet taken off as a major form of connectivity. Household Internet access is low compared with the BRICS countries of Brazil (23.8%), Russia (30.0%) and China (18.3%), but higher than India (3.4%), Indonesia (1.4%), Vietnam (6.5%) and Egypt (12.9%) (ITU, 2010: pp. 103-104).

A low 15.6% of respondents indicated that they did not want or need Internet access and only 1.5% had privacy or security concerns. As the size of the Internet user population grows and people become more familiar with web content and web-based services, the main reasons for lack of Internet access at home will be the cost of devices and connectivity.

Policy consideration

A combination of partnering with the private sector to increase broadband availability and investing in municipal and provincial broadband infrastructure can unlock Internet access for a much larger proportion of the provincial population.

Household Internet access	Frequency	Percent
Internet access		
Yes	53	13.6
No	337	86.4
Internet connectivity		
Do not know	4	7.5
Modem dialup	15	28.3
ADSL	3	5.7
Wireless	28	52.8
Broadband	3	5.7
Internet devices (multiple responses)		
Laptop computer	30	34.5
Desktop computer	29	33.3
Mobile phone	28	32.2
Reasons for not having access to the Internet at home		
Lack of skills	114	34.1
Equipment cost too high	84	25.1
Access to Internet elsewhere	49	14.7
Internet not required (not useful, not interested, etc)	36	10.8
Access cost to high (telephone, etc)	32	9.6
Internet undesirable (content harmful)	11	3.3
Privacy and security concerns	5	1.5

e-Society: household and individual ICT access and usage

8 New media: individual Internet access

Analysis

The current trend in individual Internet access is that for the majority of the sample population, access is either at home or at work. In some cases, primary access may be at home and secondary access at the place of work; alternatively, primary access is at the workplace and secondary access is at home. Access at an educational facility is ranked lower, but this is related to the way the sample population is constructed.

However, the data set out here confirms the earlier analysis that government-funded public access facilities are not providing the levels of Internet access that would imply universal access to the Internet, or fully justify expenditure on historical public access approaches, such as MPCCs. Current levels of broadband access are low and show significant room for improvement.

Policy consideration

Aggregate government expenditure on public Internet access models is not yet delivering the digital dividend. Policy on Internet access at schools and public libraries should be reviewed with the emphasis on creating universal access to the Internet.

Place of Internet usage in last six months	Missing Data		Not Applicable		Yes		No	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Home	0	0	301	77.2	53	13.6	36	9.2
Place of work	0	0	301	77.2	41	10.5	48	12.3
Place of education	0	0	301	77.2	16	4.1	73	18.7
Another person's home	0	0	301	77.2	11	2.8	78	20.0
Public library	1	0.3	301	77.2	10	2.6	78	20.0
Post Office	0	0	301	77.2	11	2.8	78	20.0
Community Centre	1	0.3	301	77.2	11	2.8	77	19.7
Internet café	1	0.3	301	77.2	27	6.9	61	15.6
Government offices	0	0	301	77.2	8	2.1	81	20.8

Type of connection	Missing Data		Not Applicable		Yes		No	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Modem dialup	1	0.3	301	77.2	36	9.2	52	13.3
ISDN	1	0.3	301	77.2	7	1.8	81	20.8
ADSL	1	0.3	301	77.2	13	3.3	75	19.2
Leased line	1	0.3	301	77.2	0	0	88	22.6
Wireless	1	0.3	301	77.2	40	10.3	48	12.3
Broadband	1	0.3	301	77.2	17	4.4	71	18.2
Don't know	0	0	301	77.2	8	2.1	81	20.8

e-Society: household and individual ICT access and usage

9 New media: individual Internet usage – time

Analysis

Individual Internet usage (28%) is more than double household Internet access (13%), confirming that Internet access for personal use at the workplace and public access approaches remain a necessity for the foreseeable future. However, only 22% of the sample population has used the Internet in the last six months and only 71% of this group uses the Internet on a regular basis. The majority of respondents who use the Internet do so at least once a week and more than a third of those who use the Internet regularly have increased time spent.

Levels of Internet access and usage are very low (ITU 2010 reports 8.4 Internet users per 100 inhabitants [2008 data] and Goldstuck 2010 estimates 10 Internet users per 100 inhabitants [2009 data]) as compared to countries with whom South Africa competes (BRICS) and countries that Gauteng may wish to emulate in terms of economic development (CIVET).

Policy consideration

Gauteng's information society policy should aim to double Internet usage among the general population every three years, aiming for 90% household Internet access and usage in six years, ie by 2016.

Individual Internet usage	Frequency	Percent
Internet usage		
Yes	110	28.2
No	280	71.8
Most recent Internet usage		
Missing data	2	0.5
Not applicable	280	71.8
Within the last 6 months	87	22.3
Between 6 months and a year	13	3.3
More than a year ago	8	2.1
Regularity of Internet usage in last six months		
Missing data	1	0.3
Not applicable	301	77.2
Every day or almost every day	48	12.3
At least once a week (but not every day)	26	6.7
At least once a month (but not every week)	13	3.3
Less than once a month	1	0.3
Increase in time spent on the Internet in last six months		
Missing data	1	0.3
Not applicable	301	77.2
Stayed the same	41	10.5
Decreased	11	2.8
Increased	36	9.2

e-Society: household and individual ICT access and usage

10 New media: Internet usage – activities

Analysis

The data presents insights into Internet usage behaviour and illustrates the shift of every-day activities into the online environment. Of the 13% of households connected to the Internet and the 22% of individuals who have used the Internet in the last six months, major activities include email, finding information about goods and services, reading news and magazines, searching and applying for jobs, searching for education and training information (approximately 60%). A smaller proportion of users conduct commercial transactions such as banking (30%), searching for health-related information or Internet-based learning (approximately 40%).

Policy consideration

Given the keen level of interest in using the Internet, the increasing size of the user population presents a strong foundation for future growth of e-government. Provincial and municipal government can further develop their e-government capability using the Internet as a channel. The next stage of e-government should focus on providing the same or similar content for both the Internet and mobile phone channels.

Internet-based usage for private purposes in last six months (not for work purposes)	Missing Data		Not Applicable		Yes		Percentage of Internet users (87)	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Communication, information search and on-line services								
Sending and receiving emails	0	0	301	77.2	77	19.7	77	88.5
Finding information about goods and services	0	0	301	77.2	62	15.9	62	71.3
Using services related to travel and accommodation	0	0	301	77.2	37	9.5	37	42.5
Downloading software (other than games software)	0	0	301	77.2	42	10.8	42	48.3
Reading or downloading news/ newspapers/ magazines	0	0	301	77.2	54	13.8	54	62.1
Looking for a job or sending a job application	0	0	301	77.2	53	13.6	53	60.9
Seeking health related information	0	0	301	77.2	33	8.5	33	37.9
Banking, selling goods and services								
Internet banking	0	0	301	77.2	26	6.7	26	29.9
Selling goods and services	0	0	301	77.2	15	3.8	15	17.2
Buying goods and services	0	0	301	77.2	11	2.8	11	12.6
Paying online using credit card	1	0.3	301	77.2	12	3.1	12	13.8
Training and education								
Looking for information about education, training or course offers	0	0	301	77.2	52	13.3	52	59.8
Doing an online course (in any subject)	0	0	301	77.2	23	5.9	23	26.4
Internet-based research for learning	1	0.3	301	77.2	34	8.7	34	39.1

Overview: evolution of e-business – SMEs in Gauteng (macro-level analysis)

The Gauteng provincial economy is predominantly a services economy, with a contribution to gross geographic product of 70.5% by the services sector (GPG, 2010b: p. 26). The sector services Gauteng, other provinces in South Africa and other countries on the African continent. The traditional services sector is composed of banking, business services and personal services, wholesale and retail, government services and community services. The new services sector is composed of tourism facilitation (Gauteng is merely a gateway to South African tourism), the film and creative industries sector, the energy sector and the rapid transport sector. Both the traditional and new services sectors utilise information networks and ICT applications as important supporting infrastructure for doing business.

The 2010 Gauteng Information Society Survey focuses exclusively on SMEs, because the objective is to understand the adoption of ICT in enterprises with relatively low levels of financial resources. The Small Business Survey Report Gauteng 2006 (African Response, 2006) reported that there were 199 000 formal and 616 000 informal SMEs in Gauteng province, giving a ratio of 2.1 formal businesses and 6.5 informal businesses per inhabitant. These are important ratios from an economic development perspective as the formal economy offered a labour absorption rate of only 27% for 2005, and the rate has been in decline for at least the decade 1995 to 2005.

The formal SME sector is comprised of registered businesses[4] that showed an average monthly turnover of R21 500. The informal SME sector can be split into unregistered businesses that showed an average monthly turnover of R2 600 and micro-businesses such as street vendors, hawkers and others that showed an average monthly turnover of R1 500. The 2006 Gauteng study introduced a Business Sophistication Segmentation measure, BSM1-BSM7, ranked according to a set of 25 indicators. BSM1 is composed largely of informal vendors and BSM7 is composed largely of formal, registered SMEs. Between 89 and 100% of SMEs in BSM1-5 are black-owned businesses and men tend to dominate in the formal SME sector, while women are the majority in the informal sector. SMEs in categories BSM 1 and 2, mainly informal vendors, were assessed as operating below the poverty line.

The majority of SMEs, on average 67% of SMEs across all businesses, are engaged in trade and selling goods, with a further 17% engaged in the service industries. Between 53 and 63% of SMEs in BSM categories 3-6 are doing business from home, effectively constituting small home-based production cells. The study showed that ICT is used (switchboard, email address, Internet, website, own network) though to a limited extent, with highest usage levels in the services sector, followed by usage in the sale of goods. Mobile phone penetration was reported as higher than fixed-line penetration in all BSM categories and as a "significant business differentiator" (African Response, 2006). Ten percent of SMEs were reported to have a computer, mainly in categories BSM 6 and 7; of these businesses, only half (ie 5% of all SMEs) had email and Internet access and very few had their own websites.

4 Registered with CIPRO, the Companies and Intellectual Property Registration Office

The ICT & Entrepreneurship Survey 2009 (Kew & Herrington, 2009) concludes that ICT usage in SMEs is relatively basic and that there appears to be a need for customised small business solutions that integrate marketing and administrative functions in a basic computerisation programme.

Given the background set out above, it is apparent that not all SMEs require access to computers and the Internet on a daily basis. Nevertheless, regular access can assist all SMEs, including informal vendors with gaining knowledge on starting and operating a business, marketing the business, and compiling business and financial plans, thus beginning to address digital exclusion of SMEs.

e-Business: SME profile

Sectors of operation and level of formality

Less than 50% of the SMEs surveyed are established businesses of four or more years. More than 50% of those surveyed are three years old or younger, while 19% were less than one year old. Most SMEs are in the wholesale and retail or the services sectors.

Business profile	Frequency	Percent
Years of operation of the business		
Missing data	1	0.1
Less than 1 year	160	19.0
1-3 years	266	31.6
4-5 years	135	16.0
6-10 years	149	17.7
More than 11 years	132	15.7
Total	843	100
Business sector, level of formality		
Missing data	6	0.7
Agriculture, Forestry and Fishing	7	0.8
Manufacturing	29	3.4
Electricity, Gas and Water	5	0.6
Construction	8	0.9
Wholesale and Retail	366	43.4
Transport and Communication	12	1.4
Services	410	48.6
Registration with CIPRO (level of formality)		
Missing data	2	0.2
Yes	440	52.2
No	401	47.6
Registration with SARS for tax purposes (level of formality)		
Missing data	1	0.1
Not applicable	401	47.6
Yes	425	50.4
No	16	1.9

e-Business: SME profile

Size of business – employees, turnover

Analysis

Most SMEs in the sample population are small enterprises with 20 or fewer employees, while the majority (56%) have between two and five employees. The SME sample population specifically included a proportion of formal and informal businesses. Hence, approximately 48% of respondents reported revenue of R100 000 or less per annum.

It is widely argued that ICT and the Internet constitute business infrastructure and contribute to the capacity of firms to be competitive. ICT infrastructure links firms including SMEs to new market opportunities and increases the speed of communicating and transacting. For informal businesses that rely on markets in the immediate proximity, eg fruit and vegetable sellers or panel-beating services, mobile telecommunications may be sufficient for the needs of the business. However, if a business is engaged in a slightly more complex market, eg a tailoring, catering or an events management SME with multiple interactions required on a regular basis, then Internet access can provide valuable supporting infrastructure.

Policy consideration

Internet access may be important for many informal businesses, not only for formal SMEs. Public access to the Internet may offer informal business new opportunities for advancement, creating foundations for digital inclusion, in particular for SMEs in BSM categories 3-7 into which approximately 89% of SMEs fit (African Response, 2006).

Business Profile	Frequency	Percent
Total number of employees		
Missing data	2	0.2
1	232	27.5
2	215	25.5
3 -5	258	30.6
6-20	113	13.4
21-50	17	2.0
51-200	6	0.7
Estimated annual turnover		
Missing data	43	5.1
Refused to answer	228	27.0
Not applicable	16	1.9
Do not know	74	8.8
R0-R5 000	115	13.6
R5 001-R10 000	66	7.8
R10 001-R20 000	66	7.8
R20 001-R50 000	108	12.8
R50 001-R100 000	47	5.6
R100 001-R250 000	28	3.3
R250 001-R500 000	16	1.9
R500 001-R1 000 000	25	3.0
More than a million	11	1.3

e-Business: SME ICT access and usage

11 SME ICT access: basic information and communication technologies

Analysis

Half of the SME respondents have a working mobile phone while just more than a third have a working landline phone. Only one-fifth of SMEs have a business fax or photocopier. Approximately a quarter of SMEs have a computer and printer. This data suggests that SMEs are not yet major participants in the information society and remain disconnected from potential markets, business opportunities and resources. The capacity to learn about revenue generating opportunities, to respond to business tenders and to engage in online procurement processes is thus limited.

Policy consideration

Gauteng plans for fostering SMEs and the informal sector should incorporate innovations for SMEs to benefit from the potential value of ICT usage and IT applications for small businesses, including systems for simplifying the filing and submission of annual tax returns.

Basic telecommunications access	Frequency	Percent
Working landline telephone		
Missing data	1	0.1
Yes	310	36.8
No	532	63.1
Dedicated working mobile cellular telephone(s)		
Yes	424	50.3
No	419	49.7
Dedicated fax for business purposes only		
Yes	185	21.9
No	658	78.1

Basic information technology access	Frequency	Percent
Working computer		
No	599	71.1
Yes (desktop)	209	24.8
Yes (laptop)	24	2.8
Yes (desktop and laptop)	11	1.3
Working printer		
Missing data	7	0.8
Yes	197	23.4
No	639	75.8
Working photocopier		
Missing data	7	0.8
Yes	183	21.7
No	653	77.5

e-Business: SME ICT access and usage

12 SME ICT access: networking and advanced ICT

Analysis

Of the only 17% of SMEs with a business ICT network, 44% have an Intranet for sharing information and online resources among colleagues. Business Internet access (18.5%) is higher than for households (13.6%), but is still low at less than one-fifth of SMEs having Internet access. Approximately 80% of businesses with Internet access use a digital connection, creating the basis for a shift from dialup to "always on" connectivity. A small proportion of businesses use email and business ICT applications, but few have websites.

Policy consideration

With appropriate marketing, services and pricing, SMEs may gain significant benefit from the various private and public sector broadband access initiatives taking place in Gauteng over the next three years.

SME ICT and Internet access	Frequency	Percent
Business ICT network		
Intranet within your business	65	7.7
Local area network (LAN)	57	6.8
Extranet between your business and other organisations	13	1.5
Wide area network (WAN)	11	1.3
None	697	82.7
Business Internet access		
Yes	156	18.5
No	687	81.5
Business Internet connectivity		
Missing data	3	0.4
Not applicable	687	81.5
Analogue modem (dialup via standard phone line)	29	3.4
ISDN (Integrated Services Digital Network)	24	2.8
DSL (ADSL, SDSL, VDSL, etc)	51	6.0
Wireless connection	32	3.8
Broadband	16	1.9
Leased line	1	0.1
Business email address		
Yes	151	17.9
No	692	82.1
Business website		
Not applicable	156	18.5
Yes	5	0.6
No	682	80.9
Business ICT applications		
Missing data	1	0.1
Customer Relationship Management (CRM) to organise data	160	19.0
Supply Chain Management (SCM)	63	7.5
Enterprise Resource Planning (ERP)	16	1.9
None of the above	603	71.5

e-Business: SME ICT access and usage

13 SME ICT access: range of devices

Analysis

SMEs still rely on the fixed-line telephone (36%), but the mobile phone has become a more important form of connectivity, with more than 50% of businesses citing it as critically important or very important to their business. Similarly, the computer is regarded as more important than a fax line, with just over a quarter of SMEs surveyed regarding it as either critically or very important.

In aggregate, the mobile phone and computer (new ICTs) (75%) are considered to be relatively more important for SMEs than fixed telephone and fax lines (traditional ICTs) (56%). Given the growing adoption of mobile telecommunications, the real access gap appears to lie in access to computers (and the Internet). While access will increase from year to year based on historical trends, the rate of increase may be slow given the costs of access relative to the income of SMEs.

In the informal sector, the barriers to access and adoption will be greater than in the formal sector, due to high access costs and the fact that there may not be an immediate, direct need for access. The benefits of computer and Internet access may not be immediately visible to a purveyor of informal business – access to knowledge about business development, access to information about sources and costs of goods.

Policy consideration

Public policy focus on the digital divide with respect to SMEs must address itself to the particular value of access to computers and the Internet to small and informal businesses.

Relative importance of basic access devices	Fixed-Telephone Line		Mobile Cellular Telephone		Fax Line		Computer	
	Frequency	Percent	Frequency	Percent		Percent		Percent
Missing data	0	0	0	0	5	0.6	0	0
Not applicable	532	63.1	419	49.7	658	78.1	599	71.1
Critically important	145	17.2	105	12.5	80	9.5	92	10.9
Very important	161	19.1	307	36.4	95	11.3	133	15.8
Not important	5	0.6	12	1.4	5	0.6	19	2.2

e-Business: SME ICT access and usage

14 SME ICT usage: Internet and e-commerce

Analysis

Of the approximately 18% of SMEs that use the Internet, 73%, or the majority, use it every day. Nearly 10% of those who use the Internet say that their usage has increased in the past six months. A range of e-commerce activities including banking, marketing, market and product research, servicing customers, placing orders and making purchases, and making and receiving online payments comprise the bulk of Internet-based activity.

The profile of SMEs with respect to their length of business operation suggests an increase in the number of SMEs coming into existence. Furthermore, it is known that SMEs often have a short life-span due to the many complexities of doing business and changing market demand for their particular services. Access to the Internet may enable SMEs to more easily undertake the activities listed below.

Policy consideration

Connecting a larger proportion of formal and informal SMEs to the Internet would see the benefits listed below, and other tangible benefits, distributed to a greater proportion of SMEs and may contribute to their longer-term sustainability.

Business Internet usage	Frequency	Percent
Frequency of business Internet use		
Not applicable	687	81.5
Every day	114	13.5
At least once a week	33	3.9
At least once every two weeks	1	0.1
At least once a month	8	0.9
Increase/decrease in business Internet usage in the last six months		
Missing data	1	0.1
Not applicable	687	81.5
Increased	82	9.7
Remained the same	72	8.5
Decreased	1	0.1

Business Internet usage activity	Not Applicable		Yes		No	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Place orders (make purchases) for goods and services via the Internet	687	81.5	107	12.7	49	5.8
Receive orders(make sales) over the Internet	687	81.5	92	10.9	64	7.6
Make online payments	687	81.5	111	13.2	45	5.3
Receive online payments	687	81.5	97	11.5	59	7.0
Use the Internet for staff recruitment	687	81.5	43	5.1	113	13.4
Use the Internet to provide customer service	687	81.5	111	13.2	45	5.3
Use the Internet to do market and product research	687	81.5	112	13.3	44	5.2
Use the Internet to do Internet banking	687	81.5	115	13.6	41	4.9
Use the Internet for sharing or distribution of information with other organisations	687	81.5	89	10.6	67	7.9
Use the internet to do marketing of the company	687	81.5	114	13.5	42	5.0
To deliver products and services online	687	81.5	69	8.2	87	10.3

e-Business: SME ICT access and usage

15 SME ICT usage: impact on the business

Analysis

The data suggests a more or less even impact of ICT usage on various aspects of business operation (all within the range of 12-13%, except for education and training at 9%). If the number of businesses for which the indicators are not applicable is taken out of the computation, then 66%, or two-thirds, of the SMEs who use the Internet regularly considered the impact on various aspects of the business, from efficiency to marketing and quality of customer service, to be either critically important or important.

The effect of a high degree of business Internet connectivity and ICT access and usage for SMEs extends beyond engagement in specific ICT-enabled activities to impact on business development, posing the importance of ICT infrastructure, applications and services for business.

Policy consideration

Public policy including growth and development strategies, information society strategies and national ICT policy and regulation should seek out and remove existing barriers to ICT access and usage.

Areas of business ICT impact	MD		NA		C		I		NI		DNK	
	F	P	F	P	F	P	F	P	F	P	F	P
Efficiency of business processes	8	0.9	691	82.0	31	3.7	77	9.1	22	2.6	14	1.7
Internal work organisation	7	0.8	691	82.0	28	3.3	75	8.9	27	3.2	15	1.8
Procurement of goods and services	7	0.8	691	82.0	29	3.4	73	8.7	26	3.1	17	2.0
Quality of products and services	8	0.9	691	82.0	36	4.3	69	8.2	23	2.7	16	1.9
Productivity of the business	8	0.9	691	82.0	38	4.5	68	8.1	22	2.6	16	1.9

MD: Missing Data; NA: Not Applicable; C: Critical; I: Important; NI: No Impact; and DNK: Do Not Know; F: Frequency; P: Percent))

Overview: evolution of e-government in Gauteng (macro-level analysis)

The Gauteng provincial government and the municipal governments of Gauteng have established investments in a number of ICT infrastructure and e-government projects. At the provincial level, the major projects are the Gauteng Schools Online project, the Gauteng Online government web portal, the Gauteng Emergency Medical Services (GEMS) operations centre and the Gauteng SAPS call centre. These large-scale projects require highly skilled human resources to manage the e-government projects effectively, thus ensuring that the quality and speed of service delivery are enhanced. The projects also require regular independent review and the publication of annual reports to the Executive Council and the provincial legislature in order to guarantee high levels of performance and financial accountability.

The G-Link programme, still under discussion, is a proposed multi-billion rand broadband infrastructure investment intended to provide broadband connectivity at every possible access point across the province. The idea behind G-Link is to pursue the objective of an inclusive information-based economy, where all major user groups not connected to the Internet via broadband infrastructure become connected.

The metropolitan municipalities for Johannesburg, Tshwane and Ekurhuleni have well-established websites and offer a limited range of e-government services including payment transactions through the banking system. However, there are few large-scale e-government projects aimed at social and local economic development. Each of the metros has formulated plans for laying municipal broadband infrastructure and Tshwane and Ekurhuleni have already laid optic fibre cabling or installed wireless broadband, while the City of Joburg has awarded a large-scale municipal broadband infrastructure contract. The next step required is to translate these plans and the associated historical and future investments into real access for communities, SMEs, large public service institutions such as schools and FET[5] colleges, hospitals and clinics, police stations and public ICT access points.

The district and local municipalities are not currently pursuing electronic government as a means of engagement with citizens or as a means of making administrative processes more efficient. Yet regular small investments in computerisation and administrative ICT applications can improve record-keeping and financial management, thus enabling small local municipalities with low revenue bases to become more efficient and more knowledgeable about effective administration. For these municipalities, multi-media approaches that push relevant services-related information to citizens via mobile phones would be a good investment, given that a significant percentage of the population in Emfuleni, Kungwini, Westonaria and other local municipalities own mobile phones.

Collectively, the range of current ICT infrastructure and e-government programmes can constitute the building blocks for the emergence of an information society in Gauteng. However, the purpose of these programmes needs to be defined more explicitly on promoting social and local economic development in a 21st century development context.

5 FET: Further Education and Training

e-Government: department/agency/municipality ICT access and usage

Institutional profile of government

Analysis

The survey was conducted with respect to 37 entities at provincial and municipal levels of government for the Gauteng province. Local municipalities such as Emfuleni, Kungwini and Westonaria have limited resources for e-government and the three district municipalities or the provincial Gauteng Shared Services Centre should provide the relevant support based on a formal agreement.

Policy consideration

The policy implications to be drawn from this and other sections of the study can inform public policy at provincial and municipal levels. The main objective of e-government is to get government online so that it can interact with citizens and businesses through online media such as the Internet or email and SMS to mobile phones. This will enable government to regularly communicate with the majority of citizens and SMEs through Internet and mobile access channels.

Profile	Frequency	Percent
Type of Institution		
Provincial Government Department	14	37.8
Provincial Government Agency	4	10.8
Local Government Agency	3	8.1
Metropolitan Municipality	4	10.8
District Municipality	3	8.1
Local Municipality	8	21.6
Other (Provincial Government Entity)	1	2.7
Total	37	100

e-Government: department/agency/municipality ICT access and usage

16 Government ICT access: computers, Internet and email

Analysis

In the majority of the 37 government entities surveyed, 76% or more employees had their own computer, Internet access and an email address. All entities had Internet connectivity and more than 80% had facilities for working remotely. In four local or district municipalities, 50% or fewer staff had their own computer and in five cases, 50% of staff or fewer had Internet access. The majority of entities use an Intranet, providing for information sharing among colleagues.

Policy consideration

Every provincial and municipal government entity should aim for at least 75% of staff, including professional and support staff, to have their own computer, Internet access and an email address. Furthermore, entities should aim to have all professional staff provided with remote net-working facilities.

ICT Access	Frequency	Percent
Government employee computer access (own computer)		
5-10%	1	2.7
11-25%	1	2.7
26-50%	2	5.4
51-75%	11	29.7
76-100%	22	59.5
Government Intranet		
Yes	29	78.4
No	8	21.6
Government Internet connectivity		
Yes	37	100
Government employee Internet access		
5-10%	1	2.7
11-25%	1	2.7
26-50%	3	8.1
51-75%	12	32.4
76-100%	20	54.1
Government employee email address		
5-10%	2	5.4
26-50%	1	2.7
51-75%	11	29.7
76-100%	23	62.2
Facilities for remote / mobile / home working		
Yes	31	83.8
No	6	16.2

e-Government: department/agency/municipality ICT access and usage

17 Government ICT access: Internet

Analysis

The majority of entities, nearly 75%, use private sector ISPs for Internet connectivity. It is noted that approximately a quarter of all entities use the Government Common Core Network (GCCN), and it must be asked whether government can keep pace with continually upgrading to newer technology as a way of keeping its telecoms costs down, or if alternative approaches should be considered. Nearly all institutions have local area networks (LANs) and the majority have wide area networks (WANs) linking their employees within individual or across multiple buildings.

Eight institutions appear to operate without a broadband connection and 22 institutions appear to operate without a virtual private network (VPN). Absence of a broadband connection will limit the upload and download speeds for Internet usage and the absence of a VPN will make remote email and Internet access impossible for senior managers and professional staff when away from the office.

Policy consideration

All institutions should operate in the broadband environment for high-speed connectivity and have VPNs for remote connectivity. Since all local municipalities link to a district municipality, ideally they should be connected to the WAN for that district municipality.

Government Internet Access	Frequency	Percent
Internet connection provided by government or private Internet Service Provider (ISP) or other public network		
Other (specify)	5	13.5
Public Administration	6	16.2
Private ISP	26	70.3
Type of Internet connection (multiple responses)		
	Responses	Percentage
Leased Line	16	43.2
ISDN (Integrated Services Digital Network)	14	37.8
Government Common Core Network	10	27.0
DSL (ADSL, SDSL, VDSL, etc) >2 Mbit/s	9	24.3
DSL (ADSL, SDSL, VDSL, etc) < 2Mbit/s	8	21.6
Wireless connections (eg satellite)	8	21.6
Other Broadband connections	1	2.7
Type of network technology (multiple responses)		
Local Area Network	35	94.6
Wide Area Network	29	78.4
Intranet	20	54.0
Virtual Private Network	15	40.5
Government Shared Network	8	21.6
Extranet	4	10.8

e-Government: department/agency/municipality ICT access and usage

18 Government ICT organisation and governance

Analysis

ICT organisation and governance is at the heart of e-government leadership. Weak leadership will negatively affect realisation of the potential for improving service delivery, including applications, notifications, payments and transactions and general communication with citizens and business. Most institutions have ICT strategies, but only one-third have e-government strategies. This is the wrong order of business. ICT should be focused on transforming the delivery and quality of services through e-government applications. Network infrastructure, content management (websites, Intranets and other multi-media) and the computerisation of government administration should play a supporting role.

Policy consideration

e-Government strategy should lead ICT strategy. The current CIO Council should be the e-government Council with CIOs representing their departmental/agency needs with respect to e-government. Then there should be an ICT infrastructure sub-committee and a content development/management sub-committee, playing supporting roles. Every institution should have an IT Security policy, a Disaster Recovery or Business Continuity plan and a Master Systems plan.

ICT strategy, policies, plans and decision-making	Frequency	Percent
ICT Strategy		
Yes	29	78.4
No	8	21.6
e-Government Strategy		
Yes	12	32.4
No	23	62.2
Do not know	2	5.4
ICT Steering Committee		
Yes	24	64.9
No	13	35.1
Open Source Software Policy		
Missing data	1	2.7
Yes	10	27.0
No	25	67.6
Do not know	1	2.7
IT Security Policy		
Yes	35	94.6
No	2	5.4
Disaster Recovery/ Business Continuity Plan (DRP/BCP)		
Yes	28	75.7
No	7	18.9
Do not know	2	5.4
Master Systems Plan (MSP)		
Yes	21	56.8
No	13	35.1
Do not know	3	8.1

e-Government: department/agency/municipality ICT access and usage

19 Government ICT usage: web presence

Analysis

Two institutions have no web presence. This should be remedied at the earliest possible opportunity, and should be provided as a service by either the relevant District Municipalities or the provincial shared services centre, though the web design and content approval should be at the institutional level. Government institutions generally perform well with respect to information content made available on their websites, though additional information needs to be provided for contacting particular business units as a central point of contact is not always ideal; and a complaints facility should be a standard element for every website. Interactive and transactional online capability requires rapid development.

Policy consideration

Immediate attention should be given to increasing the interactive and transactional capability of government institutions using the Internet as a channel. All institutions need stronger content development and management programmes with dedicated small content development teams to achieve informational, interactive and transactional e-government.

Web presence (Department / agency / municipality)	Frequency	Percent
Yes	35	94.6
No	2	5.4

Type of web presence (Department /agency/ municipality)								
Information Content (Government …)	F1	P	F	P	F	P	F	P
Provides basic information (address, telephone numbers and contact persons) for a central point of contact	2	5.4	35	94.6	0	0	0	0
Provides information on functions and services available for all business and functional units	2	5.4	34	91.9	0	0	1	2.7
Provides information about policies, procedures and rules for accessing or engaging with government in respect of the services and functions rendered	2	5.4	26	70.3	5	13.5	4	10.8
Lists staff telephone numbers and emails for business units and functions for citizen contact	2	5.4	14	37.8	3	8.1	18	48.6
Provides a complaint facility and description of how the complaint will be dealt with	2	5.4	23	62.2	4	10.8	8	21.6
Provides a news facility to inform citizens of the latest developments	2	5.4	34	91.9	0	0	1	2.7
Provides information on key events	2	5.4	32	86.5	0	0	2	5.4
Interaction (Citizens can …)								
Request written material eg brochures, local plans, etc	2	5.4	17	45.9	3	8.1	15	40.5
Download and print forms	2	5.4	30	81.1	1	2.7	4	10.8
View personal data from administrative systems/ databases	2	5.4	5	13.5	4	10.8	26	70.3
Submit personal data using web form to update administrative systems/ databases	2	5.4	9	24.3	6	16.2	20	54.1
Transactions (Government offers …)								
Full electronic case handling (full service solution with electronic decision, ie automatic and released by citizen enquiries)	2	5.4	7	18.9	7	18.9	21	56.8
Online payments through the website (eg by credit card)	2	5.4	3	8.1	8	21.6	24	64.9

e-Government: department/agency/municipality ICT access and usage

20 Government ICT usage: interactive electronic service channels

Analysis

Only a third of institutions use SMS to mobile phones as an electronic service channel and only one-fifth of institutions uses wireless and other mobile applications formats (WAP, GPRS, UMTS) as a means to create service channels. Two-thirds of institutions have established call centres for interaction with citizens, thus creating the foundation for increasing the menu of services offered through this channel. Less than 10% of institutions are using digital TV as a medium for offering services, yet it has significant future potential for transmitting local e-government content.

Fifteen years after the introduction of the idea of multi-purpose community centres and seven years after mooting the idea of e-government and Batho Pele service centres, only a handful of centres have been established and are offering services. The kiosk approach has not been successful in South Africa and while this is still an option, it may be more cost-effective to leverage already existing channels in the banking and mobile telecommunications systems for e-government services. This would create the basis for provincial and municipal governments to stay abreast of the rapidity of technological advances at a reasonable cost.

Policy consideration

Opportunities for low-cost innovation in developing interactive electronic service channels abound. Potential partnerships that could be explored include approaches to the banking sector, the mobile phone sector, digital TV service providers (including the SABC) and Internet Service Providers (ISPs).

e-Services Channels	Frequency	Percent
Mobile technology – SMS		
Yes	13	35.1
No	24	64.9
Mobile technology – WAP / GPRS / UMTS		
Yes	8	21.6
No	28	75.7
Do not know	1	2.7
Call Centre / Telephone		
Yes	25	67.6
No	12	32.4
Digital TV		
Yes	3	8.1
No	33	89.2
Do not know	1	2.7
Telematic Kiosk		
Yes	10	27.0
No	26	70.3
Do not know	1	2.7

e-Government: department/agency/municipality ICT access and usage

21 Government ICT usage: e-consultation

Analysis

e-Democracy is relatively undeveloped in South Africa and in the Gauteng province. e-Democracy may include a range of actions such as addressing a common concern (e-collaboration); online debates between elected representatives and citizens or among citizens (e-debate); political participation through online activity (e-participation), electronic voting, electronic petitioning and e-consultation.

Consultation with communities on municipal development processes is mandatory through the IDP process and online approaches to consultation could bring many more citizens into the processes of political governance, thus fostering greater social (and possibly economic) inclusion. Almost half of the government institutions surveyed have instituted some form of e-consultation.

e-Citizens implies that information society development has created the basis for citizens to be connected through online media and have the foundation to communicate with government and with each other online. It is noted that approximately one-third of the institutions surveyed monitor the emergence of online citizen's services.

Policy consideration

All government departments, municipalities and agencies in the province should incorporate ideas and proposals/actions for appropriate forms of e-democracy in their institutional development plans. While the wide range of approaches cannot be incorporated in a single year, institutions can design a roadmap for e-democracy emergence.

e-Services Channels	Frequency	Percent
Facilities to consult with citizens via the Internet		
Yes	17	45.9
No	20	54.1
Monitoring emergence of citizens' services		
Yes	12	32.4
No	25	67.6

e-Government: department/agency/municipality ICT access and usage

22 e-Government awareness and usage: C2G and B2G

Analysis

Very few citizens (20%) and even fewer SMEs (5%) appear to be aware of, or utilise, the existing range of e-Government services. Fewer than 10% of respondents have visited the national government portal and only 5% have visited the provincial government web portal and municipal government websites.

Policy consideration

e-Government services need to be marketed in the same way that e-banking or mobile phone services need to be marketed, with the relevant budget lines set for such marketing exercises and events. The SA Revenue Services (SARS) undertook very successful campaigns on e-filing and this initiative should be emulated.

Citizen-to-government interaction (C2G) using the Internet	Frequency	Percent
Missing data	2	0.5
Yes	79	20.3
No	309	79.2
Visits to national government web portal (http:www.gov.za)		
Missing data	23	5.9
Not Applicable	278	71.3
Yes	28	7.2
No	61	15.6
Visits to provincial government web portal (http:www.gautengonline.gov.za)		
Missing data	21	5.4
Not Applicable	280	71.8
Yes	21	5.4
No	68	17.4
Visits to municipality website		
Missing data	21	5.4
Not Applicable	280	71.8
Yes	22	5.6
No	67	17.2

Business-to-government interaction (B2G) using the Internet	Frequency	Percent
Missing data	2	0.2
Yes	46	5.5
No	795	94.3

Information, communication and network infrastructure

23 General ICT Penetration

Analysis

Further to the presentation of the 2010 survey results above, this brief overview of ICT penetration (mobile phone and Internet), showing household level data for the municipalities and the Gauteng province, adds another dimension for evaluation to the overall picture. It shows the differentiation in ICT penetration across metropolitan, district and local municipalities, as well as the rate of adoption of mobile phones and the Internet.

Household mobile phone penetration by municipality

It can be seen that mobile penetration is greatest in the highly urbanised metropolitan municipalities of Tshwane and Johannesburg and the district municipality of Metsweding on the urban periphery. Mobile penetration is lowest in Sedibeng and West Rand, but still high at around 72% or greater. Community survey results show penetration at 80% in 2007, while annual household survey results show an increase to 91% in 2009 (StatsSA, 2007 & 2009b). The results of the Gauteng Information Society and e-Government Survey 2010 show an estimated mobile penetration of 95% of households for Gauteng. Thus, in the space of less than 10 years, mobile penetration has gone from an average 45% to almost full household coverage. It is noted, however, that mobile usage remains at the most basic level of voice and SMS communication.

Table 1: Percentage of households with a mobile phone by municipality, Census 2001 and Census[6] 2007

Municipalities	2001		2007		2001	2007
	No. of households with mobile phone	Total no. of households	No. of households with mobile phone	Total no. of households	% of households with mobile phone	
Sedibeng DM2	78 157	225 744	175 834	241 223	34.6	72.9
Emfuleni LM	63 971	187 044	143 139	196 480	34.2	72.9
Midvaal LM	8 280	19 653	18 049	24 265	42.1	74.4
Lesedi LM	5 906	19 048	14 706	20 479	31.0	71.8
Metsweding DM	15 807	45 092	38 222	46 502	35.1	82.2
Nokeng tsa Taemane LM	5 715	14 356	12 196	14 838	39.8	82.2
Kungwini LM	10 092	30 736	26 025	31 665	32.8	82.2
West Rand DM	59 707	151 339	137 528	186 850	39.5	73.6
Mogale City LM	35 074	83 553	71 462	94 288	42.0	75.8
Randfontein LM	14 990	36 141	30 234	40 459	41.5	74.7
Westonaria LM	8 988	29 980	34 766	50 675	30.0	68.6
West Rand DM	655	1 665	1 065	1 429	39.3	74.5
Ekurhuleni MM	313 555	744 479	675 350	849 349	42.1	79.5
City of Johannesburg MM	466 313	1 006 742	950 768	1 165 014	46.3	81.6
City of Tshwane MM	288 867	561 772	571 920	686 640	51.4	83.3
Gauteng	1 222 406	2 735 168	2 549 681	3 175 579	44.7	80.3
South Africa	3 615 241	11 205 705	9 090 231	12 500 609	32.3	72.7

6 General Household Survey data for 2010 is now available

Source: Adapted from StatsSA (2007) Community Survey 2007: Basic results Gauteng, Table GP 12

Household Internet penetration by municipality

Internet penetration is significantly lower than mobile penetration with an average of 11.7% of provincial households having access in 2007, of which only 2.8% of households in Westonaria. Household Internet access has increased from an average of 11.7% in 2007 to 13.6% in 2010 according to the Gauteng Information Society Survey. The General Household Survey for 2009 (StatsSA, 2009b) indicates that for 38.2% of households, at least one member has access to the Internet either at home, work or place of education, but this does not constitute household access. This marginal increase represents change largely for upper middle to high income households, with lower middle and low income households largely excluded from Internet access. Household Internet access is likely to increase at a much slower pace than mobile access, unless key factors such as the cost of access and quality of service change for the better.

Table 2: Percentage of households having access to Internet facilities, Census[7] 2007

Municipalities	2007		2007
	No. of households having access to Internet facilities	Total no. of households	% of households having access to Internet facilities
Sedibeng DM	13 212	241 223	5.5
Emfuleni LM	8 586	196 480	4.4
Midvaal LM	2 306	24 265	9.5
Lesedi LM	2 320	20 479	11.3
Metsweding DM	3 120	46 502	6.7
Nokeng tsa Taemane LM	930	14 838	6.3
Kungwini LM	2 190	31 665	6.9
West Rand DM	13 468	186 850	7.2
Mogale City LM	9 797	94 288	10.4
Randfontein LM	2 111	40 459	5.2
Westonaria LM	1 444	50 675	2.8
West Rand DM	116	1 429	8.1
Ekurhuleni MM	89 170	849 349	10.5
City of Johannesburg MM	165 989	1 165 014	14.2
City of Tshwane MM	88 048	686 640	12.8
Gauteng	373 007	3 179 579	11.7
South Africa	900 612	12 500 609	7.2

Source: Adapted from StatsSA (2007) Community Survey 2007: Basic results Gauteng, Table GP 15

Recent research illustrates the shift in access technologies from fixed-line to wireless (mobile) Internet access. The number of wireless broadband subscribers grew by 88% in the period 2008-2009, while the number of ADSL subscribers grew only 21% in the same period and only 15% of fixed lines have become ADSL lines (Goldstuck, 2010: pp. 98-99).

7 General Household Survey data for 2010 is now available

The digital divide between local and metropolitan municipalities is stark, in particular households and SMEs in Sedibeng, Metsweding and West Rand are placed at significant disadvantage to those in the metropolitan municipalities.

Policy consideration

The digital divide between and within municipalities, with respect to Internet access, should be a major focus for policy attention as it has negative long-term economic implications for a society increasingly fuelled by access to ICT infrastructure.

Information, communication and network infrastructure

24 ICT market development

Analysis

The Gauteng province is highly urbanised with a relatively high population density, with 85% of its 3.1 million households concentrated in the three metropolitan areas. It has the largest proportion of commerce and industry compared with any other of the nine provinces. This includes mining and resources, manufacturing and a very large and well-developed services sector. It hosts six of the country's 23 universities, as well as major public sector institutions, including a large number of statutory science councils and the head offices of most of the country's state-owned enterprises such as Eskom and Transnet. This constitutes a large user population for fixed and mobile telecommunications and Internet access, hence ICT network infrastructure is relatively abundant.

Telecoms market structure – infrastructure ownership, concentration and competitiveness.

The South African telecommunications market is centred in the Gauteng province. The two fixed-line network operators Telkom and Neotel and mobile network operators Vodacom, MTN, Cell C and Virgin Mobile are the major network providers. Telkom, Vodacom and MTN still dominate the market, with evidence of a highly concentrated, uncompetitive market structure. Further multi-billion rand infrastructure investments are planned by these large players, though Telkom may have left it too late to attempt entry into the mobile market.

The mobile operators and Neotel are showing the most innovation in network infrastructure provisioning, with the mobile operators working towards deployment of fourth generation (4G) long-term evolution (LTE) technology and Neotel building converged or next generation networks. These latter networks use a combination of optical fibre cabling in the backbone network and wireless networks to the home, making it possible to provide a phone at the premises within a shorter turnaround time than with copper cabling.

The metropolitan municipalities and some large enterprises have their own network licences and infrastructure networks; however, these are currently exclusively for internal use. Broadband infrastructure availability is growing, with many hundreds of kilometres of optical fibre cabling and wireless infrastructure snaking around the more densely urbanised metros.

Though more than 400 firms were granted electronic communications network (ECNS) licences in 2009, none has yet made any significant entry into the market, in the main, for the following reasons (a) the high costs of building own infrastructure, (b) possible barriers to infrastructure sharing with the dominant operators and (c) the high costs of interconnection which have been a feature of the telecoms market from the late 1990s.

Growth in ICT goods and services sector

Demand for computers and peripheral equipment comes mainly from large enterprises and public institutions, and from upper middle to high income households. Given the volume of

demand, Gauteng has a robust market in hardware and software provision and the demand for computers with built-in cameras and modems for Skype and social networking is increasing. The approximately 700 Internet Service Providers (ISPs) and 200 Wireless Applications Service Providers (WASPs) based in Gauteng, offer a competitive Internet service market and have made an important contribution to growing the Internet subscriber base.

Telecoms and ICT market performance

Pricing of mobile services is high, resulting in mobile access with only limited usage. Pricing of entry-level basic and broadband Internet access is even higher and pricing of international connectivity still presents a bottleneck to Internet access.

The backbone network for South Africa will require upgrading and investment towards the deployment of next-generation converged networks and investments are already planned. However, the rate at which new nodes (concentrations of households and SMEs) become connected to the network needs to be speeded up if mobile telephony and Internet connectivity are to transform economic flows for the majority of households and SMEs.

Digital broadcasting

Digital television is beginning to announce itself as a potential channel for interactive communications and data exchange. Because of convergence in digital technologies and services, it is sometimes argued that putting a digital TV receiver and set-top box in every household may effectively be like putting a computer in every household. However, the current landscape for migration to digital TV in South Africa is uncertain and will require detailed investigation as regards the opportunities that digital TV presents for Internet access.

Policy consideration

While all forms of ICT infrastructure are important to create the necessary foundation for the information society, broadband infrastructure has a special importance because it offers the requisite bandwidth for today's Internet traffic. The GPG needs to formulate a broadband policy statement which indicates its views on facilitating broadband market expansion through both private sector and public sector (G-Link broadband infrastructure programme) means.

Information society leadership, policy and regulation

25 National, provincial and local level strategic leadership, policy and regulation

Analysis

From a national perspective, the evolution of the information society and e-government in Gauteng is, to some extent, captive to the level of advancement of national policy and regulation. Very slow progress is being made with respect to a national telecommunications policy and overarching information society policy. The Information Society and Development (ISAD) plan 2006 represents the most recent official government policy statement on the information society, while the document Electronic Government, The Digital Future (February 2001) represents the most recent policy statement on e-government. A national broadband policy was published in 2010, which recognised the role of provincial and local government in establishing broadband infrastructure.

Regulation of the national telecommunications landscape by ICASA has not to date significantly contributed to the evolution of an information society. Fixed-line penetration appears to be in long-term decline, with effective mobile substitution at the household and SME level. Universal access to fixed lines is no longer a requirement or useful for Internet connectivity, in an era where Internet usage requires broadband speeds and mobile broadband is more valuable than fixed broadband for a highly mobile population.

Universal access to mobile telephony has already been achieved for Gauteng with 95% of households having mobile access. Access will continue to increase over time, even in households where unemployment is high, mainly because a mobile handset can be obtained at a very low price or at no cost and air-time can be bought in small units. However, despite regulatory interventions in interconnection pricing, one of the key factors (though by no means the only one) driving high mobile access prices, call charges remain high contributing to limited mobile usage. Similarly, high mobile Internet charges limit effective Internet usage.

Provincial and municipal perspective

Provinces may have no legal authority for ICT regulation, but they do have the authority to design information society and e-Government policy and strategy. The Gauteng government has an e-Government Blueprint 2007 and has prepared a draft government ICT strategy 2010. Furthermore, the GPG is preparing a Gauteng ICT Sector Strategy for the information Society. As regards information society governance and leadership, the establishment of an ICT Political Committee comprised of the MECs for Finance, Economic Development, Health, Social Development and the Head of the Planning Commission has been an important step.

Metropolitan municipalities have prepared digital infrastructure (Ekurhuleni) or broadband (City of Joburg) strategies, but these have not been effectively implemented. Furthermore, each provincial and municipal department must formulate a strategy for enabling its services within an information society context, in particular the large departments such as health and education.

Policy consideration

The new targets for universal access and service in Gauteng province should be household broadband access to spur Internet usage for a variety of economic and domestic purposes, and cheap, competitively-priced mobile call charges to spur high levels of mobile voice and SMS usage. This will push Gauteng and eventually South Africa into an era in which ICT usage becomes the main factor in the next stage of evolution of the information society, an era where users base their usage on what they need to do, rather than on limiting their usage based on lack of affordability.

Responsibility for oversight with respect to information society and e-government policy and strategy should reside with the GPG ICT Political Committee, reporting to the Executive Committee through the appropriate Member of the Executive Council.

Provincial and municipal e-government strategies should be realistic and should be implemented within shorter time frames (one - three years) than has historically been the case.

ICT-related human resource development – e-society

26 Individual ICT expertise

Analysis

Between 65% and 75% of people surveyed lacked the confidence to conduct relatively simple tasks in relation to using and maintaining a computer and using email and Internet. Approximately 18-20% of respondents were either confident or very confident computer, email and Internet users.

Annual Internet studies (Goldstuck, 2010) suggest that Internet adoption patterns show users gaining confidence levels over time. As the Internet population grows and usage increases, expertise and confidence will grow. However, the cost of computer ownership and Internet access and the relatively low penetration of public access points remain a barrier to more rapid evolution of the information society in Gauteng.

Policy consideration

Decisions on adopting either a universal access (public ICT access points) or a universal service (home ICT and Internet access) policy approach should include thinking on skills for ICT users with respect to advanced technologies such as the Internet. This is particularly important for municipalities, given the need for a development partnership with citizens; and for major services departments such as education, health, social development, and safety and security.

Individual respondent expertise and level of confidence	Missing data		Very confident		Confident		Neither confident/ Nor lacking in confidence		Lacking confidence		No confidence	
	F3	P	F	P	F	P	F	P	F	P	F	P
Obtain and install computer software	0	0	57	14.6	50	12.8	20	5.1	28	7.2	235	60.3
Identify the cause of computer problems	0	0	37	9.5	47	12.1	28	7.2	28	7.2	250	64.1
Use email to communicate with customer			74	19.0	38	9.7	16	4.1	26	6.7	236	60.5
Participate in online discussion on a topic of own interest	0	0	55	14.1	38	9.7	25	6.4	31	7.9	241	61.8
Make a call over the Internet	0	0	39	10.0	31	7.9	21	5.4	33	8.5	266	68.2

ICT-related human resource development – small and medium enterprises

27 ICT expertise in SMEs

Analysis

In general, SMEs appear to have greater expertise and greater levels of confidence with regard to a range of typical tasks performed using ICT to enhance business efficiency and effectiveness, with satisfactory to high confidence levels in the range of 20-40%. SME users may exhibit a higher level of confidence due to the fact that these tasks are essential business tasks which are performed on a regular basis.

The data on expertise and confidence levels represents the perspective of respondents from SMEs in the formal sector, since formal SMEs are predominantly ICT users, while informal SMEs are not.

Policy consideration

As SMEs gain access to and use ICT on a more regular basis, expertise and confidence levels will grow and the availability of training opportunities may also grow. The key to unlocking growing expertise, confidence and training is access.

SME ICT expertise and confidence levels with respect to selected tasks	Missing data		Very confident		Confident		Neither confident/ Nor lacking in confidence		Lacking confidence		No confidence	
	F4	P	F	P	F	P	F	P	F	P	F	P
Obtain and install computer software onto a computer	10	1.2	151	17.9	168	19.9	80	9.5	69	8.2	365	43.3
Identify the cause of computer problems	9	1.1	120	14.2	136	16.1	109	12.9	91	10.8	378	44.8
Use email to communicate with customer	11	1.3	156	18.5	146	17.3	67	7.9	79	9.4	384	45.6
Participate in online discussion on a topic of your interest	10	1.2	126	14.9	141	16.7	90	10.7	83	9.8	393	46.6
Make a call over the Internet	10	1.2	87	10.3	98	11.6	111	13.2	113	13.4	424	50.3
Use the Internet as a search engine	9	1.1	139	16.5	117	13.9	93	11.0	87	10.3	398	47.2
Capture and store business information	11	1.3	178	21.1	135	16.0	78	9.3	59	7.0	382	45.3
Complete invoices, orders, price lists and quotes	11	1.3	171	20.3	147	17.4	73	8.7	56	6.6	385	45.7
Undertake business administration tasks such as electronic record keeping	10	1.2	174	20.6	161	19.1	64	7.6	63	7.5	371	44.0
Keeping and managing employee records	13	1.5	177	21.0	151	17.9	68	8.1	57	6.8	377	44.7
Keeping financial information and reports	11	1.3	182	21.6	154	18.3	58	6.9	64	7.6	374	44.4
Keep inventories	11	1.3	160	19.0	143	17.0	72	8.5	67	7.9	390	46.3
Maintain debtor information	10	1.2	151	17.9	152	18.0	69	8.2	66	7.8	395	46.9

ICT-related human resource development - e-government

28 ICT expertise in government

Analysis

Government retains a relatively high proportion of staff with a high degree of expertise, except for areas such as applications development, design of technology solutions and user training.

Website development and maintenance are areas that have become highly skilled areas of activity, where government appears to lack sufficient internal capacity.

Policy consideration

Provincial government and municipalities should employ small teams of content managers, web designers and web administrators to develop and maintain web content that can be pushed over the Internet both via computers and via mobile phones. Carefully selected government content made available over the Internet can spur interest in getting connected to the Internet, thus taking the necessary steps towards information society formation.

Extent to which selected ICT functions are conducted by external suppliers or own staff	Missing data		Only external suppliers		Mainly external suppliers		Largely equal distribution		Mainly internal staff		Only internal staff	
	F	P	F	P	F	P	F	P	F	P	F	P
Project management at ICT acquisition	1	2.7	7	18.9	2	5.4	4	10.8	14	37.8	9	24.3
Development of ICT strategy	0	0	4	10.8	4	10.8	1	2.7	13	35.1	15	40.5
Design of technology solutions	0	0	8	21.6	8	21.6	9	24.3	9	24.3	3	8.1
Maintaining security	1	2.7	3	8.1	5	13.5	4	10.8	14	37.8	10	27.0
Operation of servers	0	0	3	8.1	3	8.1	4	10.8	12	32.4	15	40.5
Operation of PC environments	0	0	4	10.8	1	2.7	1	2.7	13	35.1	18	48.6
User training	2	2.5	10	27.0	11	29.7	9	24.3	2	5.4	3	8.1
User support			4	10.8	1	2.7	2	5.4	15	40.5	15	40.5
Development of applications	1	2.7	14	37.8	10	27.0	2	5.4	6	16.2	4	10.8
Website development	0	0	10	27.0	8	21.6	7	18.9	8	21.6	4	10.8
Website maintenance	0	0	10	27.0	7	18.9	3	8.1	8	21.6	9	24.3

ICT-related human resource development – society, SMEs, government

29 e-Skills development

Analysis

Minimal effort appears to be expended on enhancing user skills within households and within SMEs. Government appears to be at the forefront of efforts to enhance the skills of its ICT users – government employees. However, too little use is made of e-learning programmes, which employees can engage in without having to leave the place of work and at reduced cost.

Policy consideration

ICT user skills should be offered at every public ICT/Internet access point, with short information literacy programmes aimed at individual users and basic and advanced user programmes marketed to formal and informal SMEs. Every government entity should support advanced ICT user training aimed at building a public service with the necessary capabilities to run e-government applications and projects.

e-Society skills development	Frequency	Percent
Most recent computer course		
Within the last 6 months	28	7.2
Between 6 months and a year ago	14	3.6
More than 12 months ago	75	19.2
Never taken one	273	70.0

e-Skills development in business	Frequency	Percent
Business ICT training provision		
Missing data	2	0.2
Yes	48	5.7
No	793	94.1
Use of e-learning to train SME staff		
Missing data	2	0.2
Yes	36	4.3
No	805	95.5

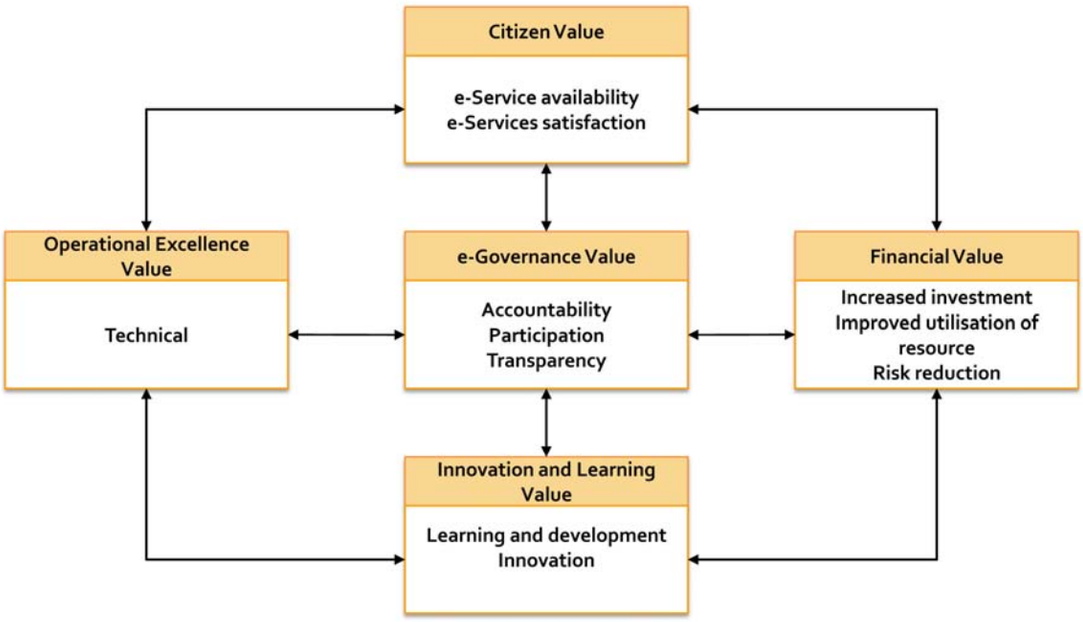
e-Skills development in government	Frequency	Percent
Support for ICT related training (department/ agency/ municipality)		
Yes	25	67.6
No	12	32.4
Use of e-learning to train government staff (department/ agency/ municipality)		
Not applicable	12	32.4
Yes	9	24.3
No	16	43.2

Chapter Three

Overview: e-government meso-level analysis

e-Government in Gauteng: from preparing the groundwork to laying the foundations

The meso-level analysis assesses the performance of the Gauteng provincial and local governments pursuing their e-government goals. The conceptual framework used to monitor and evaluate performance at this level has as its starting point an analysis of the public service transformation, information society and e-government goals and how this contributes to the development of an information society. A set of indicators were selected with reference to these goals, as the key measures against which the implementation of the GPG's information society and e-government policies, strategies and programmes should be measured. The concept of public value is introduced to embody the value to citizens and stakeholders that the achievement of these outputs and outcomes by government represent. The framework for measuring e-government development at the meso level draws on the underlying techniques of the Balanced Scorecard, incorporates the concept of public value and in so doing establishes a Public Value Scorecard (Diagram 3).



The focus of e-government initiatives implemented over the last three years has been on "attending to the basic infrastructural issues to improve access to ICTs" (GPG, 2009b), while at the same time giving priority to services in the Government to Citizen (G2C), Government to Employees (G2E) and Government to Business (G2B) segments according to the e-Government Blueprint Review. The primary approach to developing e-government has been through the implementation of pathfinder projects as the basis for scaling up rapidly and preparing the groundwork for e-government and information society development.

As can be expected at this early stage of development, the range and mix of online information and services (e-services) is limited and the design and development thereof is at best ad hoc, uneven and influenced heavily by the specific business needs of departments. The majority of government websites are in the information (29%) and interaction stages (43%) of development. Metropolitan municipality websites, given their need to interact directly with citizens in their jurisdictions on a number of fronts, achieved the highest average website maturity score compared with the provincial agencies and departments. A framework for the prioritisation of e-services for guiding the selection of services and deployment of resources for transforming these into e-services for the whole of government in the province is yet to emerge.

Steady progress has been made in establishing the requisite Service Oriented Architecture for the whole of government in the province as the basis for interoperable e-government development, a necessity for the seamless exchange of data and information that is so important in the delivery of e-services. The Integrated Master Systems Plan (IMSP) process should be finalised and its tentacles extended to the local sphere of government so that governments of Gauteng are guided by a common service-oriented architecture. Security and Identity Management still require extensive investment and development to ensure that the province complies with international standards in this regard.

The policy and institutional environment for public sector innovation in regard to e-government implementation is underdeveloped. It requires the institutionalisation of incentives and rewards to mainstream public sector innovation. Executive leadership should set the example when it comes to recognising innovations in e-government.

ICT expenditure in the province has increased by an average growth rate of 31% over the last three years and should be encouraged in the drive to expand e-service provision. The strategic capability to make investment decisions and manage the utilisation of e-government resources is an important priority so that ICT expenditure can be justified and the measurement of cost and benefits can become standard operating procedure.

Using e-government as an instrument for encouraging ICT-mediated accountability and citizen participation is a critical ingredient, yet has received little attention beyond brief references in policy and strategy documents. The development of an e-participation strategy as part of the broader e-government programme for the province should be considered.

Gauteng is poised to move beyond the phase of preparing the groundwork for e-government development. It should move to the next phase of laying the foundation for sustainable e-government by putting in place the measures for effective e-government strategic planning and management, resource mobilisation and utilisation, as well as performance management, monitoring and evaluation.

e-Government: citizen value perspective

The citizen value perspective monitors and evaluates the trends and issues pertaining to the availability and delivery of electronic services (e-services), and is concerned with levels of citizen satisfaction with such services. The provision of online information and services is a fundamental pillar of the e-government programme in the province that seeks to increase the levels of access by citizens and enhance the service experience. Importantly, it aims to organise the delivery of services around the needs of citizens bringing about a shift away from inward-looking bureaucratic systems to citizen-centred service delivery systems.

30 e-Service availability: website maturity

Analysis

A website maturity assessment was undertaken to assess the level of e-government maturity specific to government websites, following the e-Government Maturity Model described in the e-Government Blueprint Proposal (2007). An assessment of 21 provincial and local government departments and agency websites was undertaken as part of the pilot of the e-government Web Assessment Index. An overall index score out of 100% is calculated for each website against four dimensions: content and services; quality and design; organisation and ease-of-use dimensions; and privacy and security.

Websites were predominantly in the information (29%) and interaction stages (43%) of maturity. Less than one fifth of institutions have reached the transaction stage of maturity that enables users to conduct online transactions such as processing claims or applications, completing registrations, accessing departmental engines, with the capability to make payments. Only about 10% of institutions have reached the transformation stage at which point the automation and digitisation processes begin to influence and transform the way in which services are designed and delivered.

Metropolitan municipalities achieved the highest mean index (67%), followed by provincial agencies (54%). The need to interact and transact with citizens around a number of functions such as payment for rates and taxes and property evaluations appears to drive greater levels of investment in website development in the metropolitan municipalities. Websites for provincial government departments, on the other hand, are standardised according to web development templates and guides, which is useful in terms of developing a common look and feel, but can also constrain the capacity of departments to develop website content to meet the specific needs of the users of their services.

Policy consideration

Greater levels of investment in website content development are required to move the majority of departmental, agency and municipal websites into the transaction and transformation stages of maturity, following the example of the metropolitan municipalities. The formulation of e-government strategies is necessary in which departments, agencies and municipalities locate their websites at the centre of their e-services delivery arrangements, in ways such that the content can be accessed from either a computer or mobile phone. Associated plans should allocate the required financial, human and technical resources required to reach higher levels

of maturity. Although standardisation is an important consideration in achieving a common look and feel across government (for branding and marketing purposes), as well as ensuring standardised website capabilities across institutions, it is necessary to ensure that standardisation does not limit the ability to develop and build capabilities that meet the specific user needs of institutions.

Website Maturity	**Index**
Transformation Stage (80-100%): In this stage the automation and digitisation processes influence the way in which departments/ agencies/municipalities deliver services. The integration of services across different internal and external departments, and the provision of seamless services through a single and unified portal, becomes the ultimate goal. This stage is often characterised by re-engineering of existing processes to reduce or remove bottlenecks.	9%
Transaction Stage (60-81%): This stage enables users to conduct online transactions. This includes processing claims applications or registration; access to private information online; accessing departmental data systems; making payments, buying items, or making donations; and electronically requesting and receiving information.	19%
Interaction Stage (40-79%): At this stage, the websites provide simple interaction between the departments/ agencies/ municipalities and the users or citizens. These interactions include basic search engines, email and official forms available for download. The stage is regarded as a transition phase towards transaction capability development.	43%
Information Stage (0-39%): This stage is characterised by departments/agencies/ municipalities publishing information to the web and creating a presence on the Internet. The format is similar to that of a brochure or leaflet, explaining what functions and services are provided. The information tends to be static and as the e-Government capability advances the information becomes more dynamic and updated regularly. At this stage, governments only provide information and the website offers no interaction. The benefits are that government information is publicly accessible, processes are described and become more transparent.	29%

Website maturity by type of institution	**Index**
Metropolitan municipalities	67%
Provincial agencies	54%
Provincial departments	45%

e-Government: citizen value perspective

31 e-Service availability: quality of websites

Analysis

Content quality and design can make a significant contribution to building trust among citizens and encouraging the use of websites to access information and services. For this reason it is important to ensure that information is up to date, correct and trustworthy and meets the information needs of users. The website maturity assessment evaluated the quality of websites based on two criteria, (a) content quality in terms of the characteristics of website content and (b) website design focusing on the features that attract users and encourage them to use the site.

The website maturity assessment found that the two biggest factors that impacted the quality of the information were the degree to which information is up to date and the presence of links on the site that do not work. These inactive links affect the credibility of the websites in that users are not able to find the information they require. In the overwhelming majority of instances, website content was found to be clear and written in a manner that avoids specialised terms and jargon.

A major concern is the levels of inconsistency in the quality of the websites assessed. The three highest scores achieved ranged between 82 and 94%, while the three lowest scores achieved ranged between 53 and 71 percent.

Policy consideration

The absence of a website publishing guide to provide guidance to institutions is a major limitation in terms of achieving greater levels of consistency in the quality of websites across government institutions. In other jurisdictions such as Australia and New Zealand[8], web development guidelines have been developed to provide standards and guidance for the development of websites. These guidelines cover a range of criteria against which compliance is assessed, and include access and distribution; site planning; user needs analysis and testing; visual design and branding; accessibility and equity; technical development; and archiving and preservation. The development of a web publishing guideline for the Gauteng City Region should provide standards and guidelines as the basis for improving the quality of government websites.

Web Assessment Maturity Index: Highest and lowest ranked quality and design scores	Quality and Design
Highest ranked quality and design scores	
City of Johannesburg (CoJ)	94%
Ekurhuleni Metropolitan Municipality (EMM)	94%
Department of Agriculture, Conservation and Environment (GDACE)	82%
Lowest ranked quality and design scores	
City of Tshwane (COT)	71%
Gauteng Enterprise Propeller (GEP)	59%
Gauteng Gambling Board (GGB)	53%

8 http://webpublishing.agimo.gov.au/ and *New Zealand Government Web Standards 2.0, 2009*

e-Government: citizen value perspective

32 e-Service availability: range and mix of online services

Analysis

The provision of basic online information and services is a fundamental goal of e-government. According to the 2010 survey, the provision of basic information (94.6%), news (92%) and information on services and functions (92%) dominates the supply of content from government institutions. Interaction with citizens is served mostly through downloading of forms (81%) and written request for material (46%). Only 19% of surveyed institutions provide full electronic case handling that involves an automated service delivery process from enquiry, to application, to service delivery initiated electronically by the user. The provision of online payment facilities is limited to 8% of institutions.

According to the website maturity assessment, the five highest ranked institutions on the content and service dimension are the City of Johannesburg (CoJ), Gauteng Tourism Authority (GTA), Gauteng Economic Development Agency (GEDA), Gautrain and the Department of Housing (DoH). The information content provided by the City of Johannesburg (CoJ), Gauteng Tourism Authority (GTA), Gautrain and Gauteng Economic Development Agency (GEDA) is up to date, comprehensive and dynamic. Information on the functions and services is comprehensive and detailed. The different ways in which users or citizens can interact with these institutions are clearly displayed and explained. Current news is provided about a range of issues including the latest events. Extensive news coverage is provided on a variety of topics including the latest news relevant to the institution and the constituency or community it services. It includes, but is not limited to, the latest announcements on services, events, notices, entertainment and cultural events, and the weather.

Content is designed or reorganised around specific user profiles. For example, in the case of the CoJ the content is organised into information for residents, tourists and investor profiles, while in the case of GEDA it is organised in terms of users looking for information, opportunities, or partnerships. These institutions provide calendars of events that give information on past and future events. In the case of CoJ, users are able to add their own events, events are colour coded to indicate different types of occasions, and the calendar has a search function. The GTA also has a searchable events database.

More than a third of the websites reviewed provide forms that can be completed online and submitted electronically. The main types of forms available that can be completed online are for registering users to enable them to receive information, access an online database and submit an application form.

Social networking sites such as Facebook, YouTube and Twitter have provided innovative networking tools to enable institutions such as GEDA and Gautrain to create user communities that allow users to participate through being kept up to date and contributing content. User groups created on Facebook, for example, enable a community of users to join the group and participate in discussion, exchange emails, photos and other content. YouTube is used to

communicate via video uploads to the rest of the world and is used as a marketing tool to inform people about the institution and its activities.

Online services vary from registration or applications processes, to accessing information on data systems, to submitting and requesting information online, to making bookings. These services tend to fall within the Government-to-Citizen and Government-to-Business categories. Several institutions provide access to online databases through a registration process. The Department of Agriculture, Conservation and Environment (GDACE) provides access to an online Waste Management Information System, which enables the user to access information on a data system. The City of Johannesburg (CoJ) and Ekurhuleni Metropolitan Municipality (EMM) both provide a facility that enables users to complete online valuation forms as part of the process of the property valuation procedures. CoJ also provides users with access to other data systems which allow users to track their building plan application process, enter meter readings, and receive rates, water and lights invoices online. The GTA website provides online booking and payment facilities.

Several large-scale projects such as the Bana Pele and the Gauteng Online (GoL) Schools projects have been introduced to enable the delivery of a range of social services to children and ICT connectivity to children at public schools respectively. In the case of the Bana Pele project ICT is used to integrate the delivery of services to children, enabling them to access a wide range of education, psycho-social and health services. An ICT-based system to identify, refer and track support provided to children is at the heart of the project. Similarly, the provision of network and Internet connectivity infrastructure seeks to provide access to the Internet, as well as an email address for each pupil in Gauteng public schools. Although these projects increase access to and improve the delivery of services, they nevertheless fall short of transforming how the services are conceptualised, designed and delivered. These additional services made available as a result of the implementation of the projects are implemented in parallel and as complementary services to pre-existing services without necessarily transforming the pre-existing services.

Policy consideration

Despite the steady progress observed in the development of the range and mix of online information and services, the progress remains ad hoc, uneven and heavily dependent on the specific business needs of the individual government departments. There is little evidence to suggest that detailed analysis of citizen demand for e-services is undertaken before the conceptualisation and implementation of e-government service delivery projects. Although the development of e-services has to be defined by the specific needs of users of government services, the approach to the conceptualisation, development and implementation thereof requires more coherence and structure. This is needed to ensure that services are not only developed and delivered in complement to existing services, but rather that the development thereof actually transforms the pre-existing services into better streamlined and more efficient services.

Serious consideration should be given to the identification and selection of the ten most important services for transformation into e-services around which a common vision across all spheres of government in the province can be constructed, with a high level of buy-in and the sponsorship of the required resources to do so (GICT, 2007). A shift is proposed from the implementation approach of the current strategy, which hinges on the implementation of pathfinder projects that can be rapidly scaled up, towards an approach that involves the systematic analysis and selection of existing services for transformation into e-services. Two criteria should inform the selection of services. The first criterion should focus on the impact of services in terms of the volume of transactions, the coverage of the services (equity considerations), the frequency or number of times the service is required in the lifetime of a user, and the benefits of the service. The second criterion is the feasibility with reference to the ease of implementation and stakeholder acceptance (GICT, 2007).

Web Assessment Maturity Index: Highest ranked content and services scores	Content and Services
City of Johannesburg (CoJ)	88%
Gauteng Tourism Authority (GTA)	82%
Gauteng Economic Development Agency (GEDA)	76%
Gautrain	76%
Department of Housing (DoH)	72%

e-Government: citizen value perspective

33 e-Service satisfaction: levels of satisfaction with e-service

Analysis

The GCRO 2009 Quality of Life Survey for the Gauteng City-Region provides the latest data on satisfaction with government and indicates that 50% of respondents are satisfied with government, 21% are neither satisfied nor dissatisfied and 29% are dissatisfied with provincial government, while 40% are satisfied, 20% are neither satisfied nor dissatisfied and 40% are dissatisfied with local government. The degree to which these percentages extend to satisfaction with e-government is uncertain, since no formal study has been undertaken to determine the levels of take-up and satisfaction with e-services.

A survey commissioned by BlueIQ (Salvetti & Llombart, 2007) to measure the value of different public services and the levels of satisfaction, indicates face-to-face communication (64%) as the most important channel for interacting with the government, followed by telephone (61%), mobile phone SMS (60%) and the Internet (57%). The levels of satisfaction with the different channels of interaction are consistent with the level of importance associated with the specific channels. Sixty-six percent of citizens were satisfied with face-to-face communication, 62% were satisfied with mobile SMS communication, with the telephone and Internet communication reaching 62% and 57% levels of satisfaction.

Policy consideration

Regular *citizen satisfaction surveys* should be undertaken as part of the rollout of the eGovernment programme. The surveys should determine the levels of take-up, and draw samples to determine the levels of satisfaction around five dimensions in the delivery of e-services: (1) satisfaction with responsiveness; (2) satisfaction with reliability; (3) satisfaction with access and facilities; (3) satisfaction with communication; (4) satisfaction with the cost of accessing services. Application of *The Framework for Monitoring and Evaluation: Information Society and e-Government in Gauteng* (referred to as the Framework) has identified e-services satisfaction surveys as a key instrument for generating data on levels of satisfaction.

G2C Interaction Channels	Importance
Talking to someone face-to-face	64%
Telephone	61%
Mobile (SMS)	60%
Internet	57%
Kiosk (eg ATM)	47%
	Satisfaction
Talking to someone face-to-face	66%
Mobile (SMS)	62%
Telephone	62%
Internet	57%
Kiosk (eg ATM)	56%

e-Government: operational excellence value perspective

Operational excellence consists of the activities, processes and systems required to provide citizens with the range and quality of electronic services to meet their needs. These indicators are of a technical nature and refer to the provision of the required ICT infrastructure, applications, and enabling frameworks required for delivering electronic services.

34 Technical: effective implementation of Service Oriented Architecture (SOA)

Analysis

Interoperability is critical for the seamless exchange of data and information in government as the basis for providing integrated e-services. Yet the current ICT infrastructure and systems landscape in the province is littered with ad hoc business-specific ICT solutions with limited capacity for scaling up across the province, and forming the basis for shared and common infrastructure and applications. In many instances the ad hoc deployment of ICT systems reinforces the underlying disparate systems of service delivery, rather than transforming and integrating these.

Interoperability is required for the provision of seamless electronic information and delivery of services in the long term, based on better coordination, improved decision-making on ICT investments and cost savings. The Minimum Information Operability Standards (GITOC, 2007) and the Government-wide Enterprise Architecture (GWEA) Framework (GITOC, 2009) provide the standards and guidelines for the development of province-specific architecture. The most important feature of these frameworks is that they are based on open standards architecture and systems development to ensure interoperability and information flow. The Integrated Master Systems Plan (IMSP) for the GPG is at an advanced stage and will make a considerable contribution to establishing the architecture for interoperability.

Policy consideration

The completion of the IMSP process should be encouraged in order to establish the framework and architecture for province-wide interoperability. Moreover, this process should be extended to include local government. In addition, annual *e-Government interoperability reviews* should be undertaken to review initiatives and activities aimed at establishing interoperability standards, as well as associated governance and compliance processes across the provincial and municipal governments.

e-Government: operational excellence value perspective

35 Technical: security and identity management

Analysis

Cyberthreats, including breach of privacy in the case of identity management, can have a severely negative impact in the confidence that citizens have in e-government. Threats in cyberspace have changed remarkably over the last several years as new forms of cybercrime and types of threats emerge. The availability of toolkits and applications for phishing, spam, malware, scareware and snoopware means that these are relatively easy to acquire and therefore the financial and intellectual barriers to acquire and deploy these tools are lowered. Spam has evolved into a vehicle for delivering ever more dangerous viruses to computers and other Internet devices. As information technology becomes more deeply integrated into our lives, and as connections to the Internet increase, the risks of cyberthreats will spread.

Government is aware of the increasing risk, and has recognised the limited IT security risk response capability. For this reason, the establishment of a Secure Operations Centre has been initiated to consolidate the security monitoring and response capability for the province. Cybersecurity further extends to the question of identity management in cyberspace. Devising means for establishing, verifying, storing and using digital identities over the Internet is a fundamental issue for sharing personal information in the context of e-government. Without the requisite policy frameworks and procedures for governing digital identities, the risk of identity theft is a reality. The Identity Access Management Project was initiated to develop a secure identity and access management system to manage all government related systems and applications through standardised access systems throughout the province.

Policy consideration

Confidence and security play a crucial role, and are regarded as two of the main pillars for building an inclusive, secure and global information society, according to the conclusions of the World Summit on the Information Society (WISIS). A special subcommittee should be established in the governance structures for e-government to deal specifically with the issue of security and identity management, to develop the policies and strategies required to comply with international standards.

e-Government: operational excellence value perspective

36 Technical: back office transformation

Analysis

The extent to which back office transformation through integration of business processes and the automation of service delivery activities have taken place within the existing e-government service delivery projects is unclear. Several e-government projects reviewed involve multiple government departments, the Bana Pele and Community Development Worker System projects. These projects seek to expand service delivery by establishing a single point of contact through which beneficiaries can access service from different departments. Links are established between the departments (for example, through the exchange of information from a common database). These links create interdependencies and enhance the possibility for inter-organisational influence and control (Bekkers, 2005). The integration of some operational and planning processes creates ambiguity about where authority vests, and where legal and political accountability rest.

Policy consideration

Questions of accountability and control are given little attention in the design and implementation of e-government projects that involve integration and automation of services between more than one department or more than one agency. The uncertainties created as a result of accountability and control ambiguities can hinder effective e-government project implementation. These questions need to be addressed in the conceptualisation and design stages of the e-government project life cycle.

e-Government: learning and innovation value perspective

Public sector organisations were designed at a time when populations were relatively homogenous and stable, unlike the increasingly diverse, stratified and mobile populations and citizenry of today. A one-size-fits-all approach therefore dominated the traditional design and delivery of public services, in stark contrast to the varied demands, needs and aspirations of individuals and communities in the 21st century (Mulgan & Albury, 2003). High levels of innovation are required in the public service to improve service delivery and transform the relationship between citizens and governments. This implies changes to the way in which government is organised and delivers its services. Thus innovation is an explicit outcome of e-government development since this process involves finding new and better ways of delivering services to citizens.

37 Technical: learning and development for innovation

Analysis

For innovation in the public sector to flourish and be sustained, it needs to be actively encouraged, recognised and rewarded through executive leadership, a supportive culture and investment in staff training and development (Australian National Audit Office, 2009). The development of skills and resources necessary to support innovations, not only in e-government, but more generally in the public service is one of the foundations required for developing innovation capability (Deloitte, 2009).

A structured and sustained approach to supporting innovation in the implementation of the e-government programme in the province is lacking. There are no formal policies for supporting innovation or incentives to encourage the development of innovative solutions. This does not mean that innovation does not take place on an ad hoc basis. Rather, measures should be introduced to ensure that innovation moves beyond isolated cases to becoming the norm in the public sector.

Policy consideration

Policies should be developed to encourage public sector innovation with a specific focus on e-government-led innovation. The policy framework should make provision for integrating performance requirements around innovation into the performance contracts of executive managers in institutions in the provincial system of government. A rewards programme should be introduced to recognise innovators and innovations. A special category for e-government service innovation could be introduced into the Premier's Service Excellence Awards, held annually to recognise and honour service excellence in providing services to the public.

e-Government: learning and innovation value perspective

38 Technical: e-government innovation

Analysis

In addition to fostering an environment to stimulate and support innovation, the development of a set of metrics is necessary to assess performance and capture knowledge about the nature and character of innovation within the Gauteng City Region. No formal metrics for innovation in the public sector in Gauteng exist to measure, monitor and evaluate innovation in e-government implementation.

Policy consideration

A structured approach to innovation in the context of e-government implementation can make a significant contribution to the quality of adopting and deploying ICTs for the purposes of e-government. Establishing the capability to innovate in the context of e-government should therefore be a prime focus. For this reason, it is proposed that e-government service innovation case studies be undertaken to assess the nature and quality of new online services, electronic service delivery processes, organisational structures, management techniques and the adoption of new service or process innovations across the GPG.

e-Government: financial value perspective

The Financial Value Perspective focuses on the ability to finance programmes and the operations necessary to deliver those programmes on a sustainable basis. The Financial Value perspective incorporates three indicators. Firstly, it is recognised that the expansion of service provision will require substantial investment into ICT-related Information Society and e-Government programmes and projects to expand and sustain electronic service delivery. Secondly, efficiency involves the better utilisation of the resources invested. Thirdly, the high failure rate of information society and e-government projects internationally (Heeks, 2003), necessitates the implementation of effective risk reduction measures to ensure that such investments achieve the intended policy and strategy outcomes.

39 Efficiency: increased investment, improved utilisation of resources, and reducing risks

Analysis

Investment in ICT has been characterised by consistent growth in the province, according to an ICT expenditure review commissioned by the Department of Public Services and Administration (KPMG, 2010). The province spends more than any other province in absolute value on ICTs, ranks fourth in terms of the percentage average annual growth (31%), which is higher than the average annual growth in total ICT expenditure (21%) in the country, including national departments. A more detailed analysis to evaluate the extent to which ICT expenditure reflects the e-government programme priorities was not possible, given that this information was not forthcoming from departments and agencies during the period of review. Such an analysis would have to take into account the difficulty in distinguishing between general ICT expenditure and e-government programme expenditure. At present the distinction is arbitrary in that e-government projects are those projects funded from the e-government budget of the Gauteng Department of Finance – Shared Services Division.

Furthermore, the information necessary to determine whether financial resources are optimally used is not available. This lack of transparency is of concern, since it would be difficult to determine whether opportunities for cost optimisation and cost management are exploited. Agreement on costing and pricing models for different categories of ICT expenditure could be used to determine, for example, whether GPG is able to achieve value for money in procuring ICT goods and services. Opportunities for cost saving through leveraging the buying power of the shared services model were not fully exploited.

The risks associated with ICT acquisition, development and deployment within the e-government programme require a special focus on risk management to ensure that such risks are effectively managed. At present the risk management and internal controls are governed by the prescripts of the Public Finance Management Act, and are undertaken within the risk management frameworks and practices established at departmental and agency level. Given the scale of ICT within the e-government programme, the development of a framework and associated standards may be necessary to effectively manage the risks associated with these investments.

Policy consideration

The link between ICT, e-government investment and the e-government programme is unclear. The development of an *e-Government ICT investment framework* should be given priority to provide a structured approach to strategic planning and management of ICT investments. It should provide the basis for justifying ICT expenditure and for measuring costs against benefits.

In addition, an annual *ICT financial value expenditure review* should be undertaken to collect financial and related performance data on e-government projects in a systematic fashion. It should indicate what the levels of ICT investments are, if the utilisation of resources has improved, and whether effective risk reduction measures have been implemented. These three indicators should be assessed within the broader context of assessing the relevance of the project objectives, the effectiveness of the projects in achieving the intended objectives and the cost efficiency of the projects.

	2006/2007 R('000)	2007/2008 R('000)	2008/2009 R('000)	Average Annual Growth
Total ICT Expenditure	8 947 550	9 757 809	12 905 943	21%
National Departments	5 696 344	6 109 613	7 609 923	16%
Gauteng	846 146	888 013	1 388 005	31%

e-Government: e-governance value perspective

e-Governance places emphasis on interactions among stakeholders that are electronically mediated. According to the United Nations (2007), governance is good when governments efficiently provide public goods of the requisite quality to citizens and, in so doing, efficiently allocate and manage resources to respond to collective problems. The essential dimensions of good governance include accountability, transparency, equity and participation.

40 e-Governance: accountability

Analysis

Accountability focuses on the mechanisms by which the performance of government can be evaluated and by which government can be held to account for its performance. The one mechanism available to citizens to express their views on government performance is the use of a complaints facility. The website maturity assessment found that an alarming 57% of websites reviewed do not have a facility for users to complain and register their dissatisfaction with government performance. Only 10% provide complaints facilities that describe how the complaint will be dealt with, list the person who will deal with the complaint and indicate how long it will take to respond to the complaint.

Policy consideration

Although the provision of complaints facilities on the websites is a useful start, greater levels of accountability can be achieved if information on contracts, tenders and budgets is made available on departmental, agency or municipal websites so that citizens can determine whether they get value for money. Furthermore, published statements on standards of conduct by elected officials and public servants, against which they can be held accountable, should also be available on websites.

Complaints	Percent
Does not provide a complaints facility	57%
Provides a central contact or complaints facility	14%
Provides a central contact or complaints facility and description of how the complaint will be dealt with	14%
Provides a central contact or complaints facility, with a description of how the complaint will be dealt with and the time it will take to respond to the complaint	5%
Provides a central contact or complaints facility, with a description of how the complaint will be dealt with, how long it will take to respond and who the specific contact person is handling the complaint	10%

e-Government: e-governance value perspective

41 e-Governance: participation and transparency

Analysis

Participation encourages greater levels of involvement of and consultation with citizens, while transparency emphasises the availability and clarity of information provided by government and access to such information by citizens. Participation mediated by ICTs is underdeveloped. Eighty percent of websites do not make provision for any form of online participation by citizens, according to the website maturity assessment. Departments, agencies and municipalities perform much better in respect of transparency, measured in terms of online information about functions and services, online information about engaging with institutions, and providing access to information.

Policy consideration

The development of an e-participation strategy should be considered.

Citizen participation	Percent
Does not make provision for online citizen participation	81%
Provides tools for online citizen participation (surveys, bulletin boards, chat rooms, blogs, webcasting, and discussion forums, RSS)	0%
Provides tools for online citizen participation and publishes results of citizen participation	19%
Transparency	Percent
Information about functions and services	
Does not provide information about functions and services at all	0%
Provides information about functions and services at the level of the department/ agency/ or local government only	0%
Provides information about functions and services for some of the departments/ business units functional within the department/ agency/ or local government	10%
Provides information about functions and services for most of the departments/ business units functional within the department/ agency/ or local government	14%
Provides information about functions and services for all of the departments/ business units functional within the department/ agency/ or local government	76%
Information about engaging with the department/ agency/ municipality	
Does not provide information for policies, procedures and rules for accessing or engaging with the department/ agency/ or local government in respect of the services it renders	10%
Provides information about policies, procedures and rules for accessing or engaging with the department/ agency/ or local government	14%
Provides information about policies, procedures and rules for accessing or engaging with the department/ agency/ or local government in respect of some of the services and functions it renders	5%
Provides information about policies, procedures and rules for accessing or engaging with the department/ agency/ or local government in respect of most of the services and functions it renders	5%
Provides information about policies, procedures and rules for accessing or engaging with the department/ agency/ or local government in respect of all the services and functions it renders	66%
Access to documents	
Does not provide access to documents	0%
Provides information brochure on the department/ agency or local government	5%
Provides information brochures and documents such as research reports, annual reports, briefings, strategic plans, performance reports and minutes of public meetings	95%

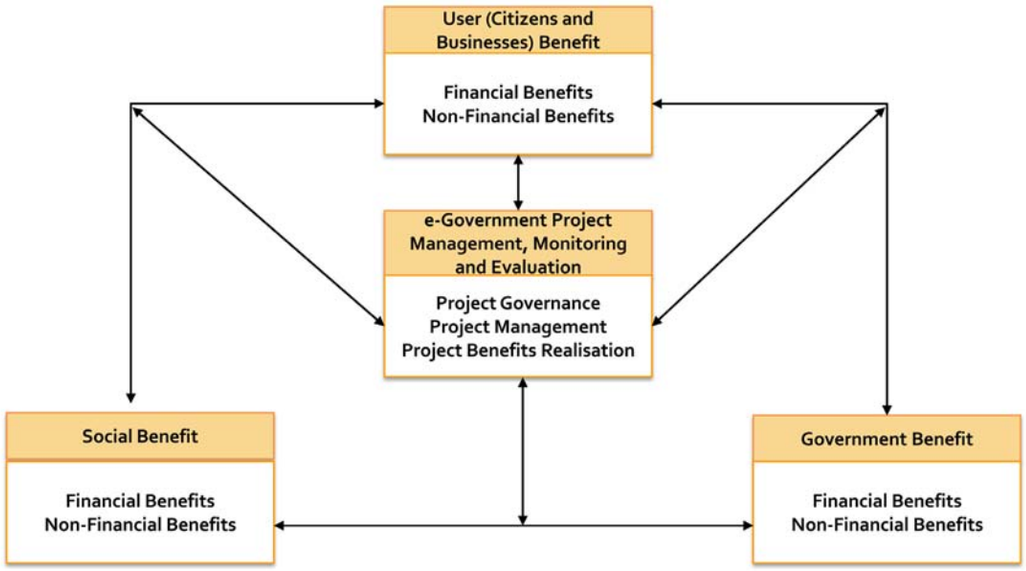
Chapter Four

Overview: e-government meso-level analysis

e-Government project implementation: towards institutionalising benefits management

The micro-level analysis assesses the benefits that accrue to users, society and government as a result of the implementation of e-government projects. It proceeds from the point of departure that the institutionalisation of benefits management can only be achieved on the foundations of mature project management, monitoring and evaluation practices. For this reason, the conceptual framework places e-government management, monitoring and evaluation at the centre of efforts to actively manage the delivery of benefits (Diagram 4).

Diagram 4: Benefits Management Conceptual Framework for Micro Level e-Government Monitoring and Evaluation



Although benefits management is referred to in e-government project documentation and is beginning to seep into the practices associated with e-government implementation, it has not yet been formally taken on board. This should be understood in the context of relatively immature systems of monitoring and evaluation of e-government projects. A concerted effort will therefore have to be made to formally introduce benefits management as a methodology for identifying, tracking and delivering benefits within the e-government project life cycle and management methodologies. This is especially important, given the increasing public investments being made in e-government development.

Where benefits were identified, it is evident that first generation e-government projects were biased towards producing benefits for government, primarily focusing on establishing the infrastructure to deliver services in the electronic environment. This is in line with the strategic priority of providing the infrastructure necessary for online access to information and service during this period.

e-Government: benefits management

User (citizens and businesses), social and government or agency benefits result from the implementation of e-government projects. User benefits are those that accrue to the users of services, social benefit refers to the benefit for the broader community, beyond the immediate recipient of the service, while government or agency benefits accrue to the agency implementing the project or the government as a whole. The e-government projects reviewed indicate that the overwhelming majority of projects benefits accrue to government and its agencies (94%), followed by benefits to society and benefits to users. This is in line with the first generation strategic e-government objectives of establishing the necessary infrastructure to promote access to electronically mediated services by citizens and businesses.

	Primary Benefits					
	User (Citizen/ Businesses)		Social		Government/ Agency	
e-Government Projects	Financial	Non-Financial	Financial	Non-Financial	Financial	Non-Financial
Open Source Software Project	0	0	0	1	1	1
Data Centre Consolidation	0	0	0	1	1	1
ICT Business Continuity Project	0	0	0	1	1	1
Gauteng Online Schools (GoL) Project	1	1	1	1	1	1
G-Link	1	1	1	1	1	1
e-Services GautengOnline Portal Project	0	1	0	1	0	1
Portal Access Points Project	1	1	1	1	1	1
Identity Access Management	0	1	1	1	1	1
Payment Engine Project	1	1	1	1	1	1
Information Technology Service Management	0	0	0	1	1	1
Single Domain	0	0	0	0	1	1
Wide Area Network (WAN) Services	0	0	0	0	1	1
Enterprise Resource Planning Project	0	0	0	0	1	1
Secure Operations Centre Project	1	1	1	1	1	1
Integrated Master Systems Plan	0	0	1	1	1	1
Bana Pele Integrated Database	1	1	1	1	1	1
Community Development Worker System Project	1	1	1	1	1	1
Electronic Document and Records Management System	0	0	1	1	1	
Total	7	9	10	15	17	17
Percentage	39%	50%	56%	83%	94%	94%

e-Government: benefits management

42 User benefits

Analysis

The Bana Pele Integrated Database, Gauteng Online (GoL) Schools, G-Link, Portal Access Point, Community Development Worker (CDW) System Project and the e-Services Gauteng Online Portal projects are the major projects aimed at addressing the needs of citizens. These path-finder projects are implemented to showcase e-services. Bana Pele is aimed at improving the way social, health and education support services are delivered to children up to the age of fourteen. The system supports the identification, capture, tracking and monitoring of children eligible for support in the social, health and education systems. It serves as a referral system that integrates the services delivered by different departments around a single point of access. In this way it seeks to benefit users by increasing access to services in order to make it more convenient for users to gain access and therefore save time and money. The CDW System uses an electronic system to record, monitor, resolve and report cases and issues within communities with the aim of improving government responsiveness. However, these projects have not fully delivered the benefits expected and have been plagued with delays due to technical issues such as connectivity.

The proposed G-Link project and the existing GoL Schools project are major investments in the provision of network and Internet infrastructure for the province. In the case of G-Link, an investment of more than R8 billion over the next five years into broadband technology will provide basic broadband to 95% of Gauteng, enrich the speed connectivity to include high-content broadband for deployment to 20% of Gauteng and provide a connectivity solution to all households. The GoL Schools project is a R2 billion investment into providing every learner with an email address and free Internet access, and into implementing a technology-enabled learning environment in the more than 2 000 public schools in Gauteng through digital laboratories, iLabs and mobile buses. More than 85% of schools have been completed, although a number of factors have hindered the progress of the project. High value items in poorly secured schools were targeted by criminals, no proactive maintenance left equipment in the field inoperable and structural defects in classrooms have had an impact on the rollout of the project.

The Portal Access Point (PAP) and e-Services (GoL) Portal aim to benefit users by making available access to government information. The PAP project gives citizens and businesses online access to government information through Thusong Service Centres, libraries and other channels. The e-Services GoL Portal project aims to modify the provincial government portal to provide better functionality through applications, as well as provide better content.

Policy consideration

User benefits appear in the business case, project charter and business planning documentation in general terms or through vague references. Defining and managing user benefits need to become well established and mature practices in implementing e-government projects.

e-Government: benefits management

43 Social benefits

Analysis

Social benefit refers to the benefit for the broader community, beyond the immediate recipient of the service. It assesses the impact of service improvements in terms of improving the quality of life in communities, and is measured in terms of service improvements, community skills and capacity development, creation of new business or work opportunities, attracting increased investment and social inclusion through improved participation. Financial benefits again refer to the cost savings that might accrue to more than just the individual user, but rather the community as a whole.

Few projects make explicit reference to benefits to the broader community. Exceptions are the G-Link and GoL Schools. The G-Link project envisages that more than 40 000 jobs will be created, that productivity will improve significantly and that it will stimulate higher economic output. The expected reduction in telecommunications cost could reduce the cost of doing business and promote social inclusion through broadband coverage to 95% of the province. The GoL Project aims to make available the services provided to schools to communities in which the schools are based and in this way promote social inclusion and economic participation. These are aims that will need to be effectively managed.

More often social benefit is implicit in the e-government projects. The Identity Access Management project which seeks to secure identity and access management throughout the project will make a social contribution through cost avoidance – for example, preventing fraud through electronic identity theft. The Payment Engine aims to make revenue collection more efficient by reducing processing times and debtor days in order to increase revenue collection for the government. The ICT Business Continuity project provides a disaster recovery solution in the event of a disaster or unplanned outage and has huge significance for preventing or mitigating losses from disasters.

Policy consideration

Social benefits are implied more often than they are explicit. Benefits management plans should be introduced that require the express identification and description of social benefits for each project.

e-Government: benefits management

44 Government benefit

Analysis

Four major categories of non-financial benefits are observed in the current e-government projects.

Firstly, governance and management benefits refer to a class of benefits that improve the governance and management function in agencies or government as a whole. Specific benefits in this category include streamlined management requirements, improved management reporting, less reliance on vendors and more effective enterprise architecture and policy. The Data Consolidation Project aims to consolidate the facility for housing the computer systems and associated components and to achieve better performance through running fewer servers and integrating multiple operating systems and applications, which in turn will streamline management requirements. The Enterprise Resource Planning project seeks to take advantage of a common platform for introducing management functionalities such as human capital, citizen relationship and asset management. The Integrated Master Systems Plan (IMSP) was initiated to analyse the total GPG ICT system as the basis for developing an Integrated Master Plan for the province.

The second category refers to improvements in data integrity, which includes better records management and increased data accuracy. The Enterprise Content Management system aims to improve the control and security of data, while the Document and Records Management projects seeks to preserve and manage government records.

The third category comprises benefits that accrue from reducing risks, and includes improved control and security. The final benefit category is effective service delivery. A whole range of benefits fall within this category and include improved service levels, increased convenience, reduced processing times, improved case management, better functionality, integration of application, and streamlined business processes. Financial benefits include reduction in the overall cost of the programme, cost savings through automation and reduced labour costs, and improved revenue collection. The relevant projects include Enterprise Resource Planning, Information Technology Service Management, and the Single Domain project.

Policy consideration

Benefits management plans should be introduced that require explicit identification and description of benefits to government for each project.

e-Government: project monitoring and evaluation

Effective benefits management hinges on mature e-government project management, monitoring and evaluation processes and systems. For this reason, the levels of project governance and management, as well as benefits management maturity and performance, need to be assessed. This is an important input into achieving the envisaged e-government project outputs and outcomes envisaged.

45 e-Government project governance: enabling policy framework and priority setting

Analysis

The e-Government Blueprint Proposal (2007) was the first attempt to draw together the different ideas and objectives on e-government into a coherent policy, strategic and programming framework. Before the approval of this document, the policy and strategic direction were implicit in the type of e-government projects implemented at the time and were only explicit in the policy statements in speeches and pronouncements made by political leaders and senior officials. Since then, the GPG ICT Strategy 2007, Gauteng Provincial Information Society and Development Plan 2007, the Gauteng e-Government Strategy 2009, and the e-Government Review 2009 have been published. All these policy and strategic statements could be considered as first-generation policy-making, and sought to establish the basic physical and network infrastructure, as well as institutional frameworks for implementing e-government.

The proliferation of policy- and strategy-making, on the one hand is a positive sign since it indicates that e-government and ICT in the government agenda are evolving, but at the same time it creates uncertainty about the precise nature of the strategic priorities and means for achieving them, as well as creating an increasingly complex environment.

Policy consideration

The development of a second generation e-government strategy and implementation plan is required in response to the changes in the e-government environment, to address the challenges that have emerged since then as well as take advantage of the progress made. Moreover, it is necessary to integrate the strategic priorities into a coherent strategic framework to guide the implementation of the e-government programme in the province in a structured and systematic fashion. Such a strategy should explicitly incorporate benefits management as a philosophy and implementation approach to ensure that the logic of benefits management is imposed on the e-government programme for the province.

e-Government: project monitoring and evaluation

46 e-Government project governance: resource mobilisation and stakeholder buy-in

Analysis

A number of institutional innovations have emerged to steer resource mobilisation activities and ensure broad participation and buy-in into the vision for e-government in the province. The establishment of the CIO Council to provide oversight, guidance and coordination is foremost among these. The Council is represented by CIOs from agencies and departments within the GPG. The CIO Council has further established the e-Government Subcommittee to provide advice and support to the CIO Council in respect of e-government matters in particular. This includes the development and revision of policy, frameworks and standards; the management of the Provincial e-Government Programme; e-government co-ordination across provincial departments and with relevant external role players; capacity development; research and development; and awareness raising. The effectiveness of the e-Government Standing Committee is a concern, given the limited participation by departments and agencies.

At departmental level, different modes of governing projects have been established, aimed at ensuring executive buy-in and resource mobilisation. In a limited number of instances IT committees have been established that draw on representatives from the different business units within a department or agency and the ICT functionaries to prioritise, plan and monitor the execution of projects. The norm is, however, to provide coordination and oversight within the established departmental or agency governance structures, which typically involves representation on/ or reporting to the Executive Committee of the organisation.

Policy consideration

The core business of the CIO Council is e-government; it is the reason for its existence. The establishment of the e-Government Subcommittee within which e-government matters are dealt with, suggests that the e-government agenda is a limited component of a larger IT in government agenda, rather than the other way around. The CIO Council should become the e-Government Council. In addition, representation on the e-Government Council should be extended to provincial agencies and local governments to ensure buy-in to the e-government agenda by all levels of government. Benefits management should become a standing agenda for discussion at the institutional bodies set up to oversee the implementation of e-government in the province.

e-Government: project monitoring and evaluation

47 e-Government project governance: project identification and selection

Analysis

e-Government strategic goals are pursued through the implementation of e-government projects. Therefore, the identification and selection of projects are critical links between the strategy and achieving the intended outcomes. An e-Government Prioritisation Framework has been developed and used for identifying, evaluating and selecting projects, based on the following criteria: budget viability; agility and adaptability; political support; constituent service capacities; organisation and governance; operational efficiency.

In practice, however, the framework is used to motivate for the selection of projects for which proposing agencies or departments do not have the financial resources, and hence seek to access the e-government budget within the Gauteng Department of Finance – Shared Services Division. In addition, the effectiveness of the e-Government Subcommittee, the body responsible for applying the framework and making recommendations for project selection to the CIO Council, is less than optimal since the subcommittee does not meet regularly. The potential for imposing the strategic priorities of the e-government programme through the project identification and selection process is underdeveloped.

Policy consideration

Unless the operational effectiveness of the e-Government Subcommittee is guaranteed, the implementation of the e-Government Prioritisation Framework will remain limited. The status and operational effectiveness of the e-Government Subcommittee should be reviewed and measures should be adopted to ensure that the project prioritisation framework is institutionalised with integrity. The criteria for project prioritisation do not include any reference to project benefits. This should be incorporated into the project prioritisation criteria so that project proposals reviewed for approval have to be more explicit about the user, social and government benefits it seeks to achieve.

e-Government: project monitoring and evaluation

48 e-Government project management: project management arrangements and expertise

Analysis

Different institutional arrangements have emerged for the management of projects and for ensuring that the required expertise is made available for the implementation of e-government projects. The size, scope and complexity of the projects, as well as the availability of expertise within government, determine the nature of the project management arrangements. Three major types of arrangements are observed. Firstly, the project management function is outsourced to a service provider, such as in the case of the Gauteng Online Schools project. In this particular example, the size and scale of the project as well as the expertise available within government influenced the decision to outsource the project management function. Secondly, the establishment of a Project Management Unit (PMU) is a further institutional innovation that has emerged in departments such as the Department of Transport, Roads and Works and the Gauteng Department of Finance – Shared Services Division. Thirdly, projects are managed internally by departments and agencies.

Policy consideration

Sufficient experience and insight have been gained over the last several years to reflect on the most effective project management arrangements (for different circumstances). The development of guidelines based on the best practices that have emerged in the province could be a useful tool in making future decisions on project management arrangements to suit different circumstances and conditions. The experiences and insights of project managers and champions across the province involved in e-government project implementation should be canvassed. The necessary benefits management expertise within the project management community of the province needs to be developed, and in cases where the services of providers are procured, benefits management capacity should be a criterion for selection.

49 e-Government project management: project implementation cycle and methodology

Analysis

A level of standardisation, balanced against the need for flexibility, is essential for improving e-government programme implementation. A formally documented project cycle is an important instrument for achieving a degree of standardisation across the life cycle of projects. At present, the project life cycle from initiation to completion exists through the experiences of project custodians, champions and managers, and should be documented to bring about increased standardisation and to establish the framework within which project management methodologies such PRINCE II, COBIT, PMBOK and ITL can be deployed.

Policy consideration

It is necessary to formulate a government-wide e-government implementation cycle that describes, sets standards and provides guidelines for seeing a project through its life cycle and for providing a framework within which to implement the most appropriate project management methodologies.

e-Government: project monitoring and evaluation

50 e-Government benefits management: benefits management integration into monitoring and evaluation

Analysis

While different practices have emerged to monitor the implementation of projects, limited attention has been paid to evaluating e-government projects to date. Three formal mechanisms for monitoring projects at different levels exist. Firstly, project-level monitoring is undertaken through the specific governance structure established for their implementation. Secondly, the implementation of the projects is monitored through the departmental monitoring and reporting systems. Annual departmental business plans and performance plans are formulated and provide details of projects, activities and budgets. Implementation is monitored against these plans and performance targets. The third monitoring mechanism involves reporting on the project at the e-Government Subcommittee if a project was formulated and prioritised under the stewardship of this committee. The committee is tasked with meeting on a monthly basis to consider progress on projects.

Project evaluation on the other hand is undertaken rarely, if at all. The variable quality underscoring the development of the business case, which is a standard approach used to motivate for the implementation of a project, is a major concern. Qualitatively and quantitatively the benefits and expected outcome and impact of a project at this early stage are fraught with difficulties. The experience of the project manager responsible for the development of the business case, the guile of the vendor in terms of how the technology is sold, and the level of political pressure exerted to get the project off the ground are all factors that impact the quality of the business case and therefore, the extent to which benefits are clearly defined.

Policy consideration

Extensive capacity building is required among project managers, monitoring and evaluation practitioners in the province and stakeholders to develop the level of expertise for monitoring and evaluation. This should include training on the benefits management approach with specific emphasis on the development of the benefits management plan, undertaking benefits reviews during the implementation, and conducting post implementation benefits reviews as part of the monitoring and evaluation function within project management. In addition, benefits management should be institutionalised through the formal integration of methodologies and tools for the effective governance, management, monitoring and evaluation practices and procedures with respect to e-government.

Chapter Five

Concluding remarks: monitoring and evaluation for information society and e-governance decision-making

The next phase of policy-making and strategy design with respect to the information society and electronic government should address the policy considerations identified in this 2010 monitoring and evaluation study. This section highlights some of the key findings and policy considerations to be taken into account.

Information society evolution can be spurred by the level of ICT penetration, but is particularly linked to the level of Internet access. While in theory a monthly household income level of R10 000 should provide the basis from which households would fund Internet access, thus creating increased potential for social communication and economic interaction, it appears that it is only at a monthly income level above R20 000 that reasonably high levels of household Internet access (>75%) commence.

Future information society development

For future information society development in Gauteng province, it is necessary to formulate an information society access strategy with due attention to the most pertinent access channels for e-society, e-business and e-government. While the provincial and municipal governments participate in the process of information society formation, they are only one of the many participating groups. Thus, these spheres of government will have to establish a clear strategic focus that uses the particular strengths of government. The strategic direction for the provincial and municipal spheres would be to:

- Focus its attention on electronic government strategy and e-government access and delivery channels as a means to increasing the value of electronic information and services to citizens
- Facilitate the widest possible deployment of infrastructure by the private sector
- Address its more limited budgets to filling in the infrastructure gaps through the strategic application of MTEF funds

Given this layered development of the information society, continuous observation is required, hence the application of a dedicated monitoring and evaluation framework for information society and e-government evolution. e-governance, or the application of ICT to the business of governing, must be nurtured. Simply computerising the administrative processes of government is not a sufficient contribution to building an information society.

e-Governance for social and local economic development

e-Governance must have a clearly established purpose, which must relate to the overarching mandate of the provincial and municipal governments for social development and local economic development. Each project designed and each budget prepared must make explicit the goals and intended social or economic benefit to be derived from the investment.

Information society access strategy and channels

A province-wide access strategy is not yet explicit, but a few elements of such an access strategy have been set out. These elements include public access at schools and digital lounges and the G-Link broadband infrastructure programme. The Gauteng government requires articulation of a comprehensive broadband access strategy based on a combination of private sector deployment and public sector facilitation, using mobile voice and SMS, Internet, broadband, banking, mobile Internet and potential digital TV channels.

Mobile connectivity using a mobile phone has increased to 95% of Gauteng households in 2010, with multiple phones for many of the 3.1 million households. While connectivity is greater in the metropolitan municipalities, thereby approaching full access for almost 85% of provincial households, approximately 20% of households in the non-metro areas and 22% of households with a monthly income below R500 lack access.

Banking channels offer a high degree of sophistication with regard to access channels for online financial transactions, and the banking system provides a tested and relatively secure environment for such transactions, whether C2G, B2G or B2B.

The next wave of technologies for ICT access and usage will be fixed or wireless Internet access via high-speed broadband connectivity, mobile Internet access using 3G and 4G technologies (computer mediated data transfer and exchange), mobile Internet access using a handheld device and dotmobi technology, and digital TV interactive return paths.

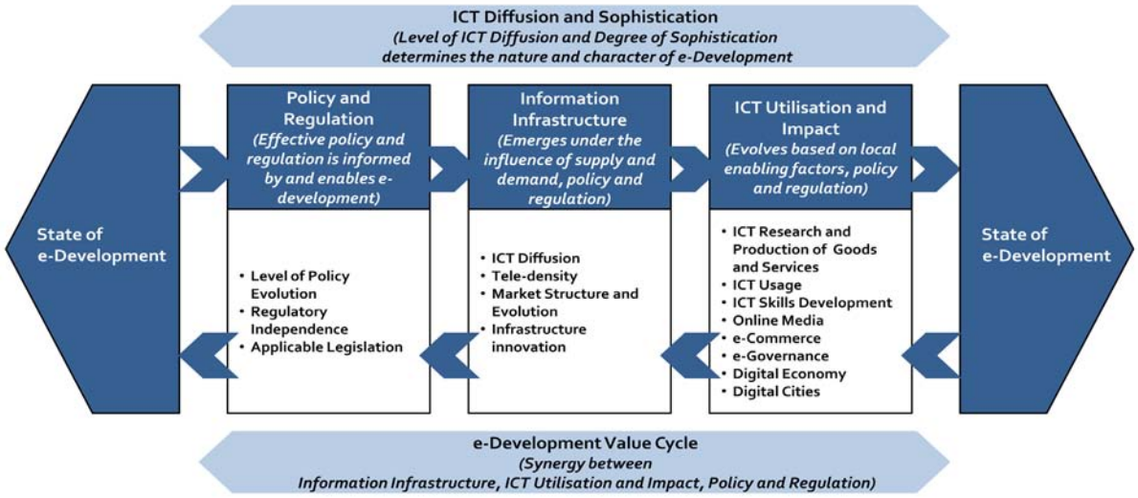
e-Governance delivery strategy and channels

There is a rapidly increasing volume of local Internet content being generated in South Africa at large and in Gauteng in particular. The focus of the GPG and municipal governments in terms of e-governance content and services delivery should be the design of structured, well-organised annual plans for content management and delivery. This planning and execution requires the introduction of suitable organisational structures in departments and agencies of the provincial and municipal governments, as well as leadership of the e-governance delivery programme at a senior level in the provincial and municipal governments. The design and execution of a comprehensive e-governance delivery programme should not present a challenge to the provincial government and metropolitan municipalities, but will certainly present a challenge to the smaller resource-challenged local municipalities.

e-Development

The design of information society access and delivery strategies and the utilisation of particular access and delivery channels are dependent on the level of e-development in a particular society (Abrahams & Goldstuck, 2010). The state of e-development (Diagram 5) is, in turn, dependent on the level of ICT diffusion and sophistication, and the value cycle created through the synergy between information infrastructure, ICT utilisation and impact and policy and regulation. Success in building these synergies can lead to digital development, while failure to create these synergies leads inevitably to high levels of digital exclusion.

Diagram 4: Perspectives on e-development



Design: Abrahams & Burke, 2010

Policy implications for Gauteng province

Information society leadership requires a strategic shift in the objectives of public policy and regulation. The new targets for universal access and service in Gauteng province should be household broadband access to spur Internet usage for a variety of economic and domestic purposes; and cheap, competitively-priced mobile call charges to spur high levels of mobile voice and SMS usage. This will push Gauteng and eventually South Africa into an era in which ICT usage becomes the main factor in the next stage of evolution of the information society, an era where users base their usage on what they need to do, rather than on limiting their usage based on lack of affordability.

Policy implications for Gauteng city-region

Information society emergence in the broader Gauteng city-region, which includes linkages from Gauteng to Klerksdorp, Potchefstroom and Rustenburg in the North West Province, Sasolburg in the Free State province and Witbank/Middelburg/Secunda in Mpumalanga, all within a 150km radius of Gauteng, will take a different path from its emergence in the highly urbanised parts of the province. Internet access levels are lower in these towns at the periphery of the city-region (Community Survey, 2007), though the economic necessity for communication and information flow between Gauteng and these smaller adjacent towns is high due to a relationship of economic interdependence. People from these surrounding towns migrate to Gauteng on either a daily or permanent basis in order to participate in the economy and send remittances back; while Gauteng provides structural and financial resources to these smaller peri-urban economies. New strategies must contemplate the digital inclusion of these peripheral towns, economies and communities.

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