E-Government and Philippine Development

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Introduction

E-government development and the use of information and communications technology (ICT) in the public sector are measured and benchmarked across the world by various assessment tools generated by universities, private organizations, and multilateral development agencies (UN 2017). For instance, the Waseda University-International Academy of Chief Information Officers (IAC) E-Government Survey, which has been running for more than a decade, employs a comprehensive set of benchmarking indicators for tracking progress (Obi and Iwasaki 2015). There are ten indicators identified including Network Preparedness, Management Optimization, Online Services, National Portal, Government Chief Information Officer (CIO), E-Government Promotion, E-Participation, Open Government Data, Cyber Security, and Use of Emerging ICT.

In the Philippines, efforts to integrate E-Government as a key lever in development started two decades ago. Over the years, innovative E-Government projects and programs were pursued to improve the delivery of public services. However, the continuity of reforms was hampered by the absence of a top-level agency that is formally dedicated to govern and oversee ICT policies and programs. In the past, every transition to a new administration results in a change in the office designated to steer E-Government implementation. In 2016, a law was passed creating the Department of Information and Communications Technology (DICT) as the primary policy, planning, and administrative entity that will promote the national ICT development agenda. It has the mandate to provide an integrated framework to optimize all government ICT resources and networks for the prioritization of E-Government systems and applications.

The establishment of the DICT represents a policy milestone in the evolution of E-Government in the Philippines. It provides an institutional anchor for mainstreaming E-Government innovations. Given the responsibility to ensure the provision of ICT infrastructures and systems as instruments of good governance and global competitiveness, the new agency can benefit from benchmarking with international measures of E-Government. Using the Waseda-IAC Survey as an assessment lens, this study examines the gaps and opportunities for enhancing E-Government performance in the country.

Planning for E-Government

The first step to position the Philippines in the information age was taken in 1997 with the formula-

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tion of the National Information Technology (IT) Plan. It envisioned an ICT-enabled future (National IT Council 1997). To further operationalize the vision, the Government Information Systems Plan (GISP) was unveiled on July 2000. It called for the establishment of an on-line government that enables every citizen, visitor, and investor to access public information and services online in their homes, in community or municipal centers, in foreign posts, in public libraries and kiosks, and in government offices. The plan laid down a comprehensive strategy for the computerization of government. It identified the administrative, financing, and infrastructural requirements to wire-up the bureaucracy (Magno and Serafica 2001). The passage of Republic Act No. 8792, or the Electronic Commerce Act of 2000, further strengthened policy support for E-Government. This accords legitimacy for electronic transactions. Under this policy, electronic data messages and documents are considered as having the legal effect, validity or enforceability as any other document or legal writing.

The Philippine Strategic ICT Roadmap 2006–2010 was crafted to update the GISP. The roadmap pointed towards the attainment of an information society that is inclusive, people-centered and development-oriented. In this regard, ICT is considered as an important driver of economic development. The information society is expected to supply relevant digital content and secure a trustworthy online ecology. The roadmap stressed the role of E-Governance, Cyber-Services, Infrastructure Investment, and Human Capital Development (ICTO 2013).

Similar to the GISP and the Philippine ICT Roadmap, the Philippine Digital Strategy 2011–2016 echoed the key role of ICT in fueling development. The strategic plan, drafted by the Commission on Information and Communications Technology (CICT) in 2011, fostered the vision of a connected and networked society empowered by ICT. Similar to the GISP and the Philippine ICT Roadmap, the Philippine Digital Strategy is aligned with the Philippine Development Plan where ICT is expected to promote economic growth and the efficient delivery of public services (CICT 2011).

Network Preparedness

Network preparedness measures the level of Internet use and subscription to broadband and mobile cellular services. As reported in www.Internetlivestats.com, the Internet penetration rate per 100 people in the Philippines climbed from 37 percent in 2013 to 43.5 percent as of July 2016. This is equivalent to more than 44 million Internet users (DICT 2017a.)

Recent trends indicate that mobile Internet use had expanded. In contrast, the volume of SMS messages had receded. The country is moving away from being the texting capital to becoming the social networking capital of the world. This signifies the migration from one form of communication medium to another. OpenSignal estimated that 68.63 percent of Internet users can see a 3 G or 4 G (or better availability) signal. The OpenSignal measurement further showed that 44.14 percent of the time the users were connected to the Wi-Fi rather than the cellular networks (DICT 2017a).

In the 2016 Annual Report of the Broadband Commission for Sustainable Development, the Philippines was ranked at 110 out of 187 member states of the International Telecommunications Union

(ITU) member states in terms of active fixed broadband subscription. The country has 3.4 fixed broadband subscriptions per 100 people in 2015. This pales in comparison to the 41.58 active mobile broadband subscriptions per 100 people for the same year. The Philippines placed 89 out of 179 ITU member states for active mobile subscription. This indicates that mobile broadband access is more prevalent as a mode for online connectivity (DICT 2017a).

In a study of digital, social media, and mobile usage around the world, it was revealed that 43 percent of Filipinos use laptop or desktop computers to access the Internet. A huge portion has mobile phones which constitute 87 percent of the population, while 55 percent own smartphones. The study also discovered that 47.13 million Filipinos are active Internet users while 35.7 million use mobile devices in accessing the Web. There are 75.4 million unique mobile users while its mobile connection is approximately 119.2 million. The number of connection per unique mobile user is 1.58. Those who use prepaid subscription total 95 percent and 47 percent of the mobile subscriptions are Mobile Connection Broadband (DICT 2017a).

With respect to frequency of Internet usage, it is estimated that 46 percent of Filipinos use the Internet daily while 30 percent use it once a week. Further, 16 percent use the Internet once a month and 8 percent use it less than once a month. There are around 48 million active social media users in the country and 41 million of this access social media through mobile devices. The heaviest Internet users come from the 20 to 29 years old age group. The infrequent users are those who are 60 years old and above (DICT 2017a).

Management Optimization

Management optimization indicates the utilization of ICT for enhancing government business processes. It optimizes the effort to integrate the silo of business processes using ICT. Under the E-Government Master Plan (EGMP), the development of the ICT infrastructure, applications, and shared services across the public sector was conducted through the PHP 470 million Integrated Government Philippines (iGovPhil) Project. The goal is to interconnect government agencies and foster collaboration among them to enhance the speed, efficiency and transparency of citizen and business transactions (ICTO 2013).

The iGovPhil started in June 2012 as a flagship project of the Department of Science and Technology (DOST) and administered through its attached agencies, namely the Advanced Science and Technology Institute (ASTI) and the Information and Communications Technology Office (ICTO). This is constituted by various components across several offices and will interconnect the current online services of the 98 national government agencies (NGAs) utilizing a network of fiber optic cables that traverse from Metro Manila to Cebu. The NGAs will be linked physically by fiber optic to be laid down along the three metro rail lines (LRT 1 and LRT2, and MRT). Many NGAs are clustered in cities where the train systems run (NCC and NIPA 2012).

This ICT network will include a data center, national records management system, e-mail and VOIP

collaboration system for all agencies, public key infrastructure (PKI), and electronic payment system. The short-term benefits include the centralized inventory of public records, prevention of inconsistent information of individuals, facilitation of information sharing, and collaboration among government offices in the management of public service programs. The long-term benefits are the speedy delivery of public services and enhanced transparency in transactions. The evaluation plan calls for system reviews to be done by the target beneficiaries. Upon deployment, users will be asked to determine systems usability, functionality and appropriateness (ICTO 2013).

The EGMP pursues a whole-of-government approach that is anchored on the Philippine Development Plan. The whole-of-government approach features moves to strengthen central oversight and expand horizontal collaboration to deal with issues of fragmentation. In this regard, the coordination of planning and service delivery across organizational boundaries is exerted (Robinson 2015). A whole of-government approach means that government systems and processes work together to provide ease of access and use by citizens. Efforts will be made to attain inter-operability of government processes, which includes converging of government databases, to realize a smart and automated government, and to continue the Inter–Agency Business Process Interoperability Program. The aim is to implement a unified ICT-enabled business process and build an information infrastructure that will allow the exchange, collaboration, and sharing of data. This will include administrative and field data of various government agencies on international migration that will be harmonized for evidence-based policy-making and planning (NEDA 2017).

As an implementation strategy, the Medium-Term ICT Harmonization Initiative (MITHI) focuses on the interoperability, collaboration, and resource sharing among government offices. This emphasizes the importance of setting up basic national electronic registries to assist interoperability measures. MITHI prioritizes interoperability but does not exclude mission-critical, agency-specific applications to enhance public service provision (ICTO 2013).

In 2016, the Department of Budget and Management (DBM) allocated PHP 4.33 billion to finance 145 new projects identified through the MITHI mechanism. These include 39 projects worth PHP 631.7 million for frontline agencies to put up online services. A key project costing PHP 1.32 billion aims to provide free Internet connectivity across the nation by building the infrastructure required to provide Wi-Fi access in town plazas, public schools and libraries, government hospitals and health centers, and other public spaces (DBM 2016a).

As additional support to optimize the provision of fast and free Wi-Fi access in public places, the amount of PHP 3.6 billion was allocated to the newly-formed DICT in 2017. The agency seeks to provide 19,023 beneficiary sites with Wi-Fi connectivity during the year. This represents a hike from the 2016 target of 14,684 beneficiary sites. Further, the amount of PHP 463 million is earmarked for the improvement of ICT operations in 359 government agencies to render speedy, efficient, and transparent services to citizens through the National Data Center Infrastructure (DBM 2016b).

In previous years, the inability of the government to use the budget allocated for the ICT sector was

evident. The utilization of the E-Government Fund, for example was characterized by gross under-spending. It was estimated that only 30 percent of the fund was used annually. This contributes to the ineffective implementation of the GISP as resources are not effectively harnessed to achieve policy results (NCC and NIPA 2012).

Online Services

Online services are provided through the Integration of business processes, policies, procedures, tools, technologies and human resources to support both assisted and unassisted customer services using ICT networks. One of the key online services developed in the country is E-Procurement. The Philippine Government Electronic Procurement System (PhilGEPS) is an electronic bulletin board and web portal of government procurement bid notices and awards. It contains all procurement processes related to bidding, contract agreements, and payment for supplies and services. The single window system simplifies government procurement through an Internet-based platform. The system is being redesigned to achieve transparency in all stages of the process from procurement planning to project management and contract implementation. The PhilGEPS will be linked with the Government Integrated Financial Management Information System (GIFMIS) to streamline budget and expenditure tracking.

Other online services that are being developed are the E-Tax and E-Health platforms. E-Tax is an online tax payment service that can be effectively developed by the Bureau of Internal Revenue. In general, online tax services allow citizens to apply for public certificates and receive tax advice at home and work via the Internet and mobile phones (NCC and NIPA 2012). BIR processes are identified in the list of government transactions that would be simplified (NEDA 2017). At the sub-national level, the E-Real Property Tax System automates the four key functions of local government units (LGUs) in real estate taxation.

E-Health should promote interoperability among the different health information technology systems. These include hospital systems, health reporting systems, and health financial systems. The objective is to generate an integrated health information system that is harmonized and beneficial to the broader public health sector. Standards are needed to build registries for diseases, terminologies, hospitals, and patients, and create systems for information exchange. The MITHI Health Cluster will fund crucial infrastructure for the interoperability of health information along with important frontline applications that can be scaled up such as community health information tracking systems and hospital operation systems (ICTO 2013).

Online services and one-stop shops are applied in efforts to ease the cost of doing business. In 2012, the Department of Interior and Local Government (DILG), DTI, and the ICTO launched the Business Permits and Licensing Services (BPLS) Automation Project. It sought to computerize the BPLS in all cities and municipalities. In coordination with the Local Government Academy, LGUs were trained in streamlining business registration processes using the prescribed standards. In 2016, the DTI, DILG,

and DICT released a Joint Memorandum Circular mandating LGUs to submit a unified application form with only two signatories. Under the circular, LGUs are asked to trim down the processing time of business registration to two days and renewals to one day, with a maximum of three steps or less in terms of procedures for both new applicants and renewals (DBM 2017).

An online service platform that is being redeveloped is PhPay. This Internet-based payment facility will enable citizens and businesses to remit payments electronically to government agencies. It renders services through various delivery channels, which include debit instructions (ATM accounts), credit instructions (credit cards) and mobile wallets (SMS). The online payment service will reduce the need for face-to-face transactions thereby limiting opportunities for corruption.

National Portal

The National Portal is the basic interface for stakeholders to access government information. As the official journal of the Republic of the Philippines, the Official Gazette provides a singular platform for publishing government documents, statements, and announcements. It functions as the National Government Portal (NGP) which is a unified interface in the form of a one-stop source for information and service delivery.

The NGP is seen as a gateway that gathers all web-based government content to maximize efficiency and deliver swift and high-quality service to citizens. The single website platform effectively lessens costs compared to maintaining multiple sites. For citizens, business or government users, this means access to reliable online public information and services. The design of the NGP allows Government-to-Government (G2G), Government-to-Citizen (G2C), and Government-to-Business (G2B) services to occur in one venue. In addition, the NGP helps to unify the Philippine Government under a singular online identity.

It is expected that he NGP would lower budget expenditures by cutting down on the operation and maintenance costs that would have arisen if multiple websites and systems are maintained. Through the NGP, government agencies can access the common platform, where applications and databases will interoperate to enable data sharing. The NGP seeks to demonstrate a uniform government appearance while harmonizing processes and enhancing transparency. It will make resource and information aggregation easier and cost-effective since the government will only spend for one platform. With a committed development and operations team, the provision of readily accessible online forms can facilitate rapid transactions, processing, and services.

The NGP reduces the number of physical appearance required in government transactions. This makes things more comfortable for the citizen. Paper-based document generation and processing time will likewise be lessened. Aside from simplifying transactions, the NGP also offers an access point for government data. This brings significant government information at your doorsteps. It allows citizens to customize their web page to display the theme and information and services they want to access at any time.

For the private sector, the NGP is a common source where business users can get information, on-line forms, applications, and other government requirements needed for their operations. The NGP hosts the integrated government service center, making it easier for businesses to get government assistance on regulatory concerns.

Government CIO

The Government Chief Information Officer (CIO) exercises leadership and governance capacity to supervise the implementation of ICT programs to improve public services. The CIO aligns ICT investment so that the balance between the applied business strategy, organizational change, and government transaction reform is achieved. Implementing E-Government is complex and requires not only a vision and a plan but also strong leadership at the highest level. Since the goal of E-Government is greater efficiency and transparency in the provision of public goods, institutional reforms are needed (Magno 2010).

In 2016, Republic Act No. 10844 was passed creating the DICT with the mandate to serve as the primary planning, coordinating, and administrative entity to implement the national ICT development agenda. The establishment of a permanent Department signals the institution of regularity in the exercise of top-level leadership in the e pursuit of ICT development and E-Government programs. The law provides for the creation of a CIO Council which shall consist of CIOs with the DICT Secretary serving as the Chairman. The CIO Council will assist the Department in the implementation of government ICT initiatives.

The EGMP provides for the formation of a Corps of CIOs. The CIOs are assigned and deployed to national and key government units. They are tasked to advise agencies on how best to leverage ICTs to optimize the delivery of public services, and achieve efficient and cost effective operations. They are responsible for developing, maintaining and managing the agency's Information Systems Strategic Plan (ISSP). The CIOs will managing and supervise the implementation of ICT-based projects, systems and processes. They will formulate and implement a Process Transformation and Change Management Plan in relation to the adoption of ICT-based solutions. They are expected to manage operational risks related to ICT in coordination with the agency's management and stakeholders, and ensure that the ICT programs and operations are consistent with national policies and standards (ICTO 2013).

The pool of CIOs will be provided institutional support through service groups that will render technical and administrative support for E-Government projects, including the National ICT Governance Service, Systems and Infrastructure Development Service, Systems and Infrastructure Management Service, National ICT Competency Management Service, and Administrative, Financial and Management Service (ICTO 2013).

E-Government Promotion

E-Government promotion is evaluated by looking at the legal parameters, enabling mechanisms, support systems and assessment programs. The previous laws that supported E-Government promotion such as the Electronic Commerce Act of 2000 provided legal recognition to digital signatures, documents and data, and can be used for transaction purposes. Nevertheless, these measures are geared more towards promoting E-Commerce rather than E-Government. The legislation of the DICT Act of 2016 represents a big step in institutionalizing public support for E-Government. Under the law, the DICT has the power to design an integrated framework to optimize all government ICT resources and networks for the identification and prioritization of E-Government systems and applications as provided in the EGMP and the Philippine Development Plan.

The creation of the DICT serves as a strong enabling mechanism for E-Government. In the past, there were issues regarding the continuity of E-Government programs as the governance body for ICT matters changes with the election of a new president. The ITECC, which was an inter-agency council coordinated by the Department of Trade and Industry during the Estrada presidency, was replaced by the CICT. In turn, the CICT which was a commission formed through an executive order issued by President Arroyo was abolished and its functions assumed by the ICTO which was an office of the Department of Science and Technology during the Aquino administration. With a permanent agency now in place, there is greater confidence in the sustainability of E-Government reforms.

The government use planning tools such as roadmaps, assessment reports, and master plans to guide the development of E-Government programs. As a master plan, the current EGMP is a blueprint for the integration of ICT for the whole of government. It builds on past plans and acknowledges that the issue of government interoperability and harmonization is not solely a technical problem, but includes many organizational concerns. As such, the plan describes the systems of governance that need to be strengthened for the effective implementation of E-Government programs and projects (ICTO 2013).

E-Government promotion was also carried out through budget support mechanisms such as the E-Government Fund (EGF). The facility was created to finance mission-critical, high-impact cross-agency projects. The EGF was initially created under the General Appropriations Act (GAA) of 2003. The fund was set up by allocating 2 percent of the capital outlays and maintenance and other operating expenses of each government agency for E-Government projects. This amounted to around PHP 4 billion. In 2004, Executive Order No. 269 mandated the institutionalization and inclusion of the EGF in the annual budget. Since its institutionalization in the national budget, the allocation for the EGF designed has amounted to at least PHP 1 billion annually. For the 2014 budget year, the EGF allocation reached PHP PHP 2.48 billion (Disini Law Office 2015).

The government used assessment and benchmarking techniques for E-Government promotion. In 2012, a joint report called the *Electronic Government Development and Strategy*: *Assessment, Research, Strategy, and Implementation Plan* were produced by the National Computer Center and the National

IT Industry Promotion Agency of South Korea. It provided an analysis of existing policies and regulations, organizational systems, education levels, ICT infrastructures, front and back office operations, and critical information requirements. Projects for priority implementation were determined based on key criteria such as level of importance and urgency, degree of innovation, and ease of Implementation (NCC and NIPA 2012).

An assessment of the positive gains from innovation can contribute to E-Government promotion among local governments. In several cases, city governments cited ICT for contributing to accuracy of records, increases in tax collection and other income, and improvements in efficiency, accountability, and transparency (Iglesias 2010). The more successful LGUs are those who are open towards engaging in initiatives that are performance-based rather than doing things simply for procedural compliance (Magno 2010). Assessment programs can also be linked to performance awards as a means for E-Government promotion. For example, the Excellence in ICT for Good Governance for LGUs (E-Gov Awards) has been going on for the past seven years. This annual search recognizes the local governments with the best practices in applying ICT towards the effective and efficient delivery of public services.

E-Participation

E-Participation refers to ICT-enable participation in governance processes. It focuses on the demand side of E-Government in terms of how people are using digital platforms. To foster E-Participation, digital inclusion initiatives are needed. Digital inclusion seeks to address the digital divide problem which is considered as a phenomenon where certain groups, based on social, demographic, and geographic factors, are at a disadvantage due to lack of access or facility with ICT (Bannister and Leahy 2014).

There are ongoing initiatives at both the national and sub-national level to strengthen the E-Participation aspect of E-Government in the Philippines. The E-Participation through the National Government Portal (www.gov.ph) Program is being developed by the DICT as a commitment under the Philippine Open Government Partnership (PH-OGP) National Action Plan 2017–2019. Under the program, a set of online tools will give citizen access to government information, space for consultation, and a platform for collaboration. It has three main components. The first is E-Information which equips citizens with open data and public information. The second is E-Consultation which solicits inputs from citizens on public deliberations on policy issues. The third is E-Decision Making which encourages citizens to co-design and co-produce public goods and services.

The National Government Portal endeavors to heighten citizen participation in public policy and service provision by deploying E-Participation tools. The plan is to launch www.gov.ph with at least five of the following priority services of the government: (1) basic services, (2) Voting Services, (3) taxation services, (4) education and scholarships, (5) civil services, job openings, and trainings, (6) business registration, (7) investing, (8) OFW services, (9) housing, and (10) citizenship and migration. A

centralized e-consultation platform on www.gov.ph will be developed with tools for online petition tool, online policy consultation, and citizen feedback.

At the sub-national level, the Open Legislation Platform through Social Media and Website in the provinces of Albay, Bohol and Surigao del Norte is being developed as an E-Participation mechanism. It is also part of the Philippine Open Government Partnership (PH-OGP) National Action Plan 2017–2019. In the existing local legislative process, citizens can only provide feedback on a limited number of ordinances through public hearings. Thus, most people lacked awareness of the ordinances passed in the *Sanggunian* or local legislative assembly. Participation in public hearings is limited due to lack of interest among the constituents as well as the inaccessibility of the venue. Although civil society organizations are members of the local special bodies, their participation in local legislation remains weak.

The Open Legislation Platform will supplement local participation in *Sanggunian* committee hearings and public assemblies. It aims to leverage technology to improve participation. Social media, such as Facebook, is viewed as an accessible medium for citizens. This online mechanism will open up opportunities for citizen engagement with elected officials in local legislation.

In the area of digital inclusion, a key strategy employed by the Philippine government has been the establishment of Community E-Centers (CECs). Investments in this enterprise since 1999 have resulted in the expansion of Internet penetration through the collective access points provided by the centers. The creation of CECs as well as cyber cafes that serve outlying provinces and municipalities was driven Declining investment costs for Internet services led to the expansion of CECs and cyber cafes in the outlying municipalities (Lallana and Soriano 2008).

The setting up of CECs in rural areas was meant to foster the social inclusion of farming communities by enabling them to use the Internet for development gains (Magno 2014). In 2005, the e-Agrikultura Project (Agricultural Growth through Information and Knowledge Networking) was pursued in six provinces. In the CECs, members of the farmers' cooperatives were trained to access the Pinoy Farmers Internet site that allowed them to acquire information on farming technologies, crop diseases, appropriate seeds to plant, and ways to optimize crop yields. Farm income increased and promoted diversity in livelihood opportunities (Barrios, Lansangan and Daquis 2011).

Digital inclusion efforts received further policy support with the passage of Republic Act No. 10929 or the Free Internet Access in Public Places Act on August 2017. The law highlights the need to strive towards the full realization of the right to Internet access as a basic human right. It promotes social inclusion through ICT-enabled citizen participation. The policy aims to provide online government services to Filipinos, especially those living in the countryside who have limited or no access to the Internet.

Open Government Data

Open government data concerns information that can be freely used, reused and redistributed. The released data is available online to allow the public to access it without having to pay fees. In 2013, the

Office of the Presidential Spokesperson (OPS), Presidential Communications Development and Strategic Planning Office (PCDSPO), and Department of Budget and Management (DBM) formed the Open Data Policy (ODP) Task Force to begin dialogues and engage partners in the transparency initiative.

The ODP Task Force coordinated with the different government agencies to facilitate the publication of government datasets, harmonize existing portals, formulate data disclosure policies of government, and deepen engagement with stakeholders, such as the academe, developers, civil society, media and private sector (DBM 2013). The Open Data Portal at www.data.gov.ph was launched in 2014. For the past three years, the government has been able to upload more than 3,300 data files on public expenditures and other information from the various agencies. Originally housed at the Department of Budget and Management (DBM), the Open Data platform is now lodged at the DICT (Magno 2017).

At the sub-national level, the Full Disclosure Policy (FDP) Portal serves as the open data platform of the Department of the Interior and Local Government (DILG) to promote transparency and accountability among LGUs. The FDP requires local officials of provinces, cities and municipalities to fully disclose the financial transactions of the LGUs to keep their constituents informed on how the LGU budget is managed and disbursed. The data must be posted in at least three conspicuous places and in the FDP Portal. LGUs may also post the information in print media and in their respective websites.

The weakness of the transparency effort lies on the demand side. It was recommended that the government should provide a dedicated feedback channel within the Open Data Portal for key stakeholders such as CSOs, media, and citizens to identify and request datasets. Transparency is not just about placing documents online, but also responding to citizen demands for information that matters. Otherwise, the data disclosed simply depends on the choice of current officials (Mangahas 2013).

The active use of open data to monitor public services is crucial in addressing the transparency deficit. It is important to put up feedback loops to engage citizens and other stakeholders in the co-creation and delivery of services, as well as the development of response networks, to maintain a lively ecosystem of open data users. There is a need to encourage sustained third party creation and submission of data visualizations through building the data literacy of information designers and providing useful links to infographic applications. An engaged academic community can conduct independent reviews of open data initiatives and help strengthen civil society audits of public performance. ICT developers and start-up communities can conceptualize practical mobile applications related to government information sharing and tracking public service provision (Capili 2015).

Cybersecurity

Cybersecurity is assessed by looking at how the government is able to protect the security properties of the organization and user assets against relevant security risks. Addressing these risks become urgent given the dark forces in the online world. On February 2016, the SWIFT (Society for Worldwide Interbank Financial Communications) payment system of the Bangladesh Bank was hacked. Fraudu-

lent instructions were sent to the New York Federal Reserve Bank to transfer funds to multiple accounts in the Philippines amounting to USD 101 million. A forensic investigation discovered that a malware was installed in the bank's system and was used to gather information on the procedure used by the bank for international fund transfers.

The Department of Justice recorded 614 cybercrime incidents in 2014. Hacking of government websites is common. The government must work closely with the ICT sector in building a robust and trustworthy digital environment (Magno 2016). On March 2016, the server of the Commission on Elections was hacked by Anonymous Philippines in which at least 54 million sensitive data were leaked into the web. The suspect was arrested by the National Bureau of Investigation after the Internet Protocol address used was tracked down. In 2016, at least 68 government websites were subjected to attacks including attempts of hacking, defacement, and Distributed Denial of Service or DDoS (DICT 2017b).

The newly created DICT is mandated to address cybersecurity issues. The Cybercrime Investigation and Coordination Center (CICC), which was formed through the Cybercrime Prevention Act of 2012 (Republic Act No. 10175), and the National Privacy Commission, which was created through the Data Privacy Act of 2012 (Republic Act No. 10172), joined the DICT as attached agencies. The DICT will implement a comprehensive National Cybersecurity Plan and institutionalize the adoption of information security and risk management approaches. It is tasked to ensure the rights of individuals to privacy and confidentiality of personal information, guarantee the security of critical information infrastructures, and safeguard the security of information assets of the government, individuals and business (DICT 2017b).

The DICT will render technical support to government agencies in the development of guidelines in the enforcement and administration of laws, standards, rules and regulations governing cybersecurity. It is authorized to issue updated security protocols to all government employees in the storage, build public-private partnerships for information sharing involving cyberattacks, threats, and vulnerabilities to cyber threats, and establish linkages for coordination on domestic, international and transnational efforts related to cybersecurity (DICT 2017b).

After establishing the baseline results for cyber security assessment and compliance, government agencies are expected to participate in national cyber drills and exercises. Currently, the country has no single authority that manages a national database and monitors threat reports, including intrusion attempts and other computer incidents. The data remains in silo with different agencies. A national database for monitoring and reporting will be set up. A program for a national computer emergency response program will be created with guidelines to aid government agencies in the event of a cyberattack. Chief Information Security Officer (CISO) programs will be instituted in government agencies and LGUs. The government will engage with the academe to support the development of cybersecurity specialists through education and training programs. A long-term goal is the establishment of a Threat Intelligence and Analysis Operations Center to house the research and development program on cy-

bersecurity (DICT 2017b).

The Use of Emerging ICT

The use of emerging ICT aims to improve E-Government quality in the Philippines. A key innovation is the Cloud computing. It is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources, such as networks, servers, storage, applications and services, that can be rapidly provisioned and released with minimal management effort or service provider interaction. Among its features are on-demand self-service, broad network access, resource pooling, rapid elasticity and measured service. The initial Government Cloud (GovCloud) infrastructure was set up in 2013 by ICTO, which was then under the Department of Science and Technology, as part of the Integrated Government Philippines (iGovPhil) Project which aims to provide cloud infrastructure access to government agencies. GovCloud will provide a platform that Govmail, public key infrastructure (PKI), payment systems, records management, and other hosting and communications services will be operating on (ICTO 2013).

On January 2017, the DICT issued a memorandum circular addressed to both national agencies and local governments prescribing the Philippine government's Cloud First Policy. The policy is aimed at reducing the cost of government ICT, improving employee productivity, and crafting better citizen online services through the utilization of cloud computing technology. Various governments such as the United States, Australia and the United Kingdom have enacted similar Cloud First Policies. To pursue its Cloud First Policy, the DICT relaunched GovCloud on March 2017. Through GovCloud, agencies will be able to share resources, hardware, and software over the network connected to the data center. It is expected to lead to inter–agency collaboration, operational continuity and business recovery, faster deployment of services, greater budget control and decreased spending on legacy infrastructure (Reyes 2017).

The DICT awarded the PHP 373 million build, operate and transfer (BOT) cloud solution project to the Vibal Group, a cloud and education technology company. GovCloud would execute a hybrid cloud strategy that would use both the private and public cloud. The creation of a private in-country data center would ensure data security, while the off-premise public cloud would make online information and services available to government agencies (Reyes 2017).

Conclusion

The Philippines posted strong and sustained economic growth rates for the past several years but has fared poorly in investing enough for public infrastructure and services. The government is determined to answer the problem of budget underspending and will leverage technology for more efficient public spending (Diokno 2017). This presents a good opportunity to improve the utilization of the E-Government Fund and the effective implementation of ICT projects in the public sector.

Studies indicate that a major barrier towards E-Government is the bureaucratic culture that is averse

to risk and resistant to change (Lallana, Pascual and Soriano 2002). Measures can be made to enhance performance incentives, grants, and bonuses that are tied up with accomplishing the results criteria for E-Government.

The continuity of E-Government reforms has been hampered in the past by the absence of a top-level agency that is formally dedicated to govern and oversee ICT policies and programs. The passage of the law creating the DICT in 2016 fills a critical institutional gap. Under the policy, the development of a pool of CIOs will provide the leadership needed for managing E-Government programs at both national and sub-national levels.

Under the new policy architecture, the Philippines can now transition from the non-integrated and agency-specific applications toward an E-Government model where there is sharing of data and interoperability of government offices to provide public services with better value for citizens. The membership of the country in the Open Government Partnership has led to the design of online services that leverages technology to promote participation, transparency, and accountability.

There is a need to develop the demand side of open data and policies. Citizen oversight and monitoring of public services can be strengthened with information intermediaries who can analyze the information made available in online transparency portals. The government can engage universities as knowledge partners in capacity building for CIOs and research programs for tracking E-Government progress.

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