

Next Generation M-Government in Mobile Economy: Transformation Framework and Recommendations

Settapong Malisuwan¹,
Wassana Kaewphanuekrungsi²,
and Jesada Sivaraks³

National Broadcasting and Telecommunications Commission, Thailand

¹settapong.m@nbt.go.th

²wassana.k@nbt.go.th

³jesada.s@nbt.go.th

Abstract - Mobile communication technology is playing a vital role in transforming various fields of government operations, especially those geared toward efficient public services, raising transparency and good governance. The utility of mobile communication technology to drive government services will encourage information sharing and innovation, but the transformation of traditional government agencies into ones with great mobility is not an easy proposition as it will involve proper planning and preparedness to handle technological and personnel changes as well as essential institutional culture adjustments. This research aims to provide guidelines for transforming traditional government agencies into m-Government entities. The research will produce a m-Government Transformation Framework that includes practical steps of creating a m-Government.

Keywords - M-Government, Mobile, Transformation, Framework

I. INTRODUCTION

Information and communication technologies, especially mobile communication technology, greatly affect our everyday life changing in an unprecedented way how people communicate that has not been witnessed in the past decade. Today people in every country have easy and fast

access to data and information, knowledge, and mobile business transaction channels to the extent that puts pressure on the government sector to improve public services by raising their speeds, efficiency and transparency consistent with changing public expectations and fast advances of changing technologies.

Governments in various countries, therefore, are trying to incorporate mobile communication technology in public services and internal institutional management. With its easy, fast and cost-efficient access, mobile communication technology gives government agencies opportunities to raise efficiency and public satisfaction of their services, as well as boost transparency of their operations. But deploying this technology to achieve these goals will involve not only additional budgets for acquiring related equipment, it also requires understanding of smart strategic planning that is essential for implementing the transformation in an efficient manner that will truly meet higher public expectations.

Smart portable devices like tablets and smartphones that are linked to mobile broadband networks allow people to work unconstrained by time, location or speed of sending large files of data. A forecast by GSMA estimates that the level of mobile broadband links through 3G and 4G networks in 2020 would be about 70% higher than that of 2014 as illustrated in Chart 1 with the rapid rise of the links expedited by projected fast

falling prices of mobile devices which will boost their affordability, as well as more extensive and deeper network coverage.

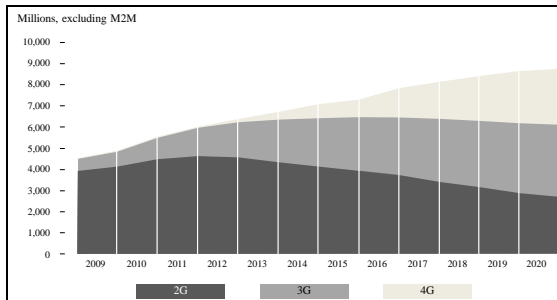


Fig 1. Global Mobile Connections by Technology [1]

Governments in various countries generally appreciate benefits of mobile technologies in driving their performance of delivering public services. Today many countries promote usage of mobile communication devices to help improve services and raise investment in mobile communication systems essential for supporting their works. The principal goal of m-Government should focus on citizen oriented administration which is generally viewed as the basis of public services.

Although development of m-Government has been gradual and mostly without fanfare, it is regarded as a key future infrastructure of public sectors in many countries. Developing countries that have embarked on building m-Governments include Turkey, the Czech Republic, the Philippines and Jordan.

In developing countries, mobile technology application by the public sector is key to giving people access to digital communications, information and knowledge, as well as diverse public services. This is especially true in remote rural areas as building new mobile communication networks nationwide can be completed with speed, which will quickly resolve previous problems of accessing public and private business services unavailable earlier in these areas. This will help frog-leap national development and contribute to a highly important issue of encouraging public participation in government affairs.

The study concludes [6] that providing people with market access to mobile communication devices is a top priority that governments should adopt as an urgent issue, i.e.

- Outside state agencies, governments need to find ways for easy public access to mobile communication devices, probably with governments moving to provide the general public mobile applications and mobile-optimized websites that can give people access to comprehensive government services.

- Inside state agencies, governments need to streamline and develop policies on usage of mobile communication devices as well as undertake all means to secure cyber-security.

II. RESEARCH METHODOLOGY

Rapid development of mobile communication broadband technology and mobile devices including application programmes have totally changed individual behaviour towards public and private sector services creating new opportunities and challenges in new dimensions to which all governments need to adapt, adjust and develop official strategies of providing services in the right directions in a future mobile economy under a mobile economy framework.

Governments greatly need to create a transformation framework and seek new opportunities of serving people that will produce efficient, sustainable technological and social changes that are arriving at great speeds exceeding expectations, as well as new challenges facing digital and mobile economies.

The objectives of this research are to propose the m-Government Transformation Framework and recommend implementation and development of an efficient m-Government. It is intended as a quality research based on in-depth interviews and supported by inputs of secondary data culled from academic papers, business and best-practices reports made by respectable reference

sources. Its primary data will come from in-depth interviews of distinguished experts in related fields under the following research framework as illustrated by Fig. 2.

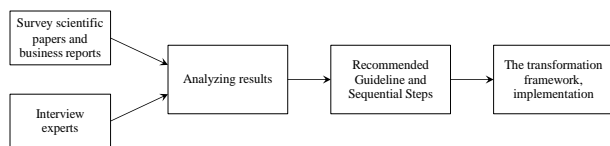


Fig 2. Research Framework

The experts sought for in-depth interviews for this research are those from five academic fields as shown in Table I:

TABLE I
INTERVIEWING EXPERTS AND KEY FOCUS

Area of Expertise	Numbers
Telecom Engineering	3
Information Technology	3
Economic	3
Social Science	3
Policy and strategy	3

The in-depth interviews for this research focused on five fields directly related to the issue of m-Government, i.e. telecom engineering, information technology, economics, social science, and policy and strategy, with 3 experts from each field adding up to a specialist group of 15.

Inputs from the in-depth interviews will be processed and analyzed together with secondary data which will be collated into a preliminary draft conclusion to be forwarded to the 15 experts for further comments with an intention of streamlining them into a shared common direction. The version assessed and scrutinized by the 15 experts will then be adopted as a basis for formulating a m-Government transformation framework with a guideline for implementing key points to ensure efficient and successful transformation.

III. GOVERNMENT IN MOBILE ECONOMY

In response to fast changes in emerging mobile economies, governments need to

appreciate changing characteristics in various dimensions, from the previous absence of mobile communication capability to the current universal mobility of communications which are creating new ubiquitous societies, a major turning point for societies and all aspects of public services with following critical points:

1. Mobile Solutions Touch Everything

Mobile capability is being embedded in every business. The connection of mobile devices with communication networks has become a simple feature enabling people to interact fully and smoothly with government agencies and corporate entities. There is a trend of fast rising connections between people equipped with mobile devices with mobile broadband communication networks, together with creation of new software contents and new service formats.

2. Mobile Economy is a Key Driver

There is a clear, visible trend of people in every country using mobile broadband communication devices to conduct business with trading firms ranging from SMEs to giant corporations. Academic researches like the analysis by GSMA show that people can quickly access high volumes of knowledge and highly efficient analytical capability, hence governments need to build mobile broadband tools to support people creating these new businesses essential for future sustainable economic growth.

3. Mobile capabilities need to be enabled throughout all points of the supply chain, not only connecting people but also machines

Machine-to-machine (M2M) communications is a major and vital part of a digital and mobile economy because M2M enables storage of data on each point of the process of shipping goods and services. Accordingly, m-Government can help materially in boosting efficiency, transparency and accountability of the entire supply chain, and encourage more public participation in expressing opinions in the political process.

4. The new mobile economy is based on the principle of innovation

A major key of the new economy is innovation, thus a challenge for governments is how to create a work environment conducive to innovation. This can be achieved by creating a process of learning both by the government and by giving public access to knowledge databases through m-Government. Governments are obliged to promote life-long learning as knowledge is an essential part of the new economy.

5. Telecommunication Infrastructure

In developing m-Governments, governments need to give priority to creating communication infrastructures, including mobile and wireless broadband connections and their applications. When completed, these infrastructures will encourage more public usage of mobile phones that will be a government challenge to control and develop legal application frameworks and provision of wireless services. Accordingly, the role of governments to intervene in developing wireless mobile devices should get high priority as it will determine the success of m-Governments. Strategies of m-Governments will rely on availability of mobile phone infrastructures including mobile broadband. One advantage of expanding m-Government services is that it requires low initial investment as its development relies on existing mobile communication networks already invested by 3G/4G mobile phone service providers.

IV. TRANSFORMING E-GOVERNMENT TO M-GOVERNMENT

Today the public sectors of most countries have already transformed themselves into e-Governments, and the trend is to move further to m-Governments. To facilitate this transition amid a current environment of emerging mobile economies, governments need to embrace a comprehensive mobile strategy in the implementation stage for all government agencies by fully and efficiently utilizing mobile capabilities in the entire government process.

The World Economic Forum Global Agenda Council on the Future of Government has proposed a matrix to serve as a guideline for governments to implement transformation into m-Governments. The change should lead to higher-valued quality public services that can fulfill public needs and expectations. The guideline, if followed, will produce governments with FAST (flatter, agile, streamlined and tech-enabled) characteristics as illustrated on Table II.

**TABLE II
THE FAST MATRIX OF GOVERNMENT TRANSFORMATION [8]**

Dimension to be addressed and measured Flatter		
What should be measured/assessed and improved?	Possible hard data/indicators (areas)	Possible proxies and/or qualitative indicators (areas)
<ul style="list-style-type: none"> Layers of government to be faced by users/citizens in typical interactions Balance between central and local government responsibilities Evidence of citizen engagement in decision-making 	<ul style="list-style-type: none"> Creating a new business Public tenders Life events certificates Cities' responsibilities Online feedback mechanisms Use of social media across government units and by the public sector 	<ul style="list-style-type: none"> Perception of how "flat" government is among citizens and businesses Perception of "proximity" between government and users of public services Agile
Dimension to be addressed and measured Agile		
What should be measured/assessed and improved?	Possible hard data/indicators (areas)	Possible proxies and/or qualitative indicators (areas)
<ul style="list-style-type: none"> Ability of existing public structures to adapt and transform themselves in face of new demands and opportunities Evidence of innovative behaviours across government units Responsiveness to requests/expectations from citizens and businesses 	<ul style="list-style-type: none"> Record of new services offered over a certain period of time (e.g. past year) Record of time-saving and cost-saving (to users) for a set of typical services to citizens and/or businesses (e.g. improvements over a one-year period) Extent of opengov/ opendata initiatives 	<ul style="list-style-type: none"> Perception of how "agile" government is among citizens and businesses Perception of how innovative government is
Dimension to be addressed and measured Streamlined		
What should be measured/assessed and improved?	Possible hard data/indicators (areas)	Possible proxies and/or qualitative indicators (areas)
<ul style="list-style-type: none"> Staffing levels relative to output of government services Existence of shared processes and networks across 	<ul style="list-style-type: none"> Staff/output (measured in volume or value of services provided) Extent of e-procurement, HR 	<ul style="list-style-type: none"> Perception of how "streamlined" government is among citizens and businesses

public departments and services • Administrative efficiency	management tools, shared databases and knowledge across ministries	• Image of civil servants' efficiency across national population
Dimension to be addressed and measured Tech-enabled		
What should be measured/assessed and improved?	Possible hard data/indicators (areas)	Possible proxies and/or qualitative indicators (areas)
<ul style="list-style-type: none"> • Availability of ICT in government • Extent of government services available online • Pervasiveness of new media/social networks in public sector • Civil servants tech-savviness 	<ul style="list-style-type: none"> • ICT equipment, bandwidth and services (including social networks) available in government • Percentage of government services online • Extent of social networks in G2B and G2C interaction 	<ul style="list-style-type: none"> • Perception of how "tech-enabled" government is among citizens and businesses • Image of civil servants' tech-savviness and innovativeness across national population

As mobile communication technologies give people more channels to voice freely their opinions on government and politicians' performances through diverse social networks, prompting the authorities to be more on alert to improve public services to meet public expectations. It is, therefore, evident that governments in the near future cannot afford to ignore the need to undertake the m-Government transformation. However, such transformation should take place within a proper strategic policy framework taking into account risks in various aspects and the need to recruit personnel qualified to undertake the jobs under a m-Government environment. Governments also need to plan adjustments to changing work cultures within organizations.

The definition of m-Government as stipulated in [9] is "...the utilization of all kinds of wireless and mobile technology, services, applications and devices for improving benefits for parties involved in e-Government, including citizens, businesses and all government units."

The interesting study in [9] produces relevant recommendations worth special attention on the issue of transformation as follows:

- Adjust policies and regulations as appropriate

- Apply the principle of performance management
- Encourage competition and offer incentives
- Promote demand
- Create public participation
- Promote cooperation through networking and public participation

In a way, m-Government can be regarded as an extension of e-Government by using new information technology like mobile broadband connections to improve performance of state agencies. In the case of m-Government, information technology which is normally confined to telephones and wireless or remote equipment connected to telecommunication networks give people and government agencies access to data and public services at all times.

m-Government is suitable for developing countries which have low Internet penetration but enjoy high access to wireless or remote communication equipment and fast rising usage of mobile broadband connections. In other word, m-Government takes greater advantage than e-Government of communication facilities in developing countries where mobile and wireless equipment infrastructure is better developed than Internet infrastructure. However, high levels of access to mobile devices do not necessarily guarantee extensive usage. People may not trust the safety and privacy of services offered by a m-Government, unless the authorities move to convince them of adequate legal protection on the safety and privacy aspects of local Internet services, which mean that proper legislation on these issues must be instituted and enforced to gain extensive trust of public users that any business conducted online will be adequately protected.

A study paper "Towards Understanding Success Factors in Interactive Mobile Government" jointly published by Shadi Alkhamayseh, Elaine Lawrence and Agnieszka Zmijewska [10] concluded that in the past decade, governments of all countries had attempted to provide public services through

the Internet with varying degrees of success. A major turning point came with the upgrading of e-Government to m-Government, with the latter still in the infancy stage waiting for further sustained development. Factors that determined the success of m-Government are: 1) Privacy and security, 2) Infrastructure, 3) Users' demand and satisfaction, 4) Quality and user friendliness, 5) e-Government, 6) Recognition, 7) Costs, 8) Standards of data transmission and exchange, 9) m-Government structure, 10) Widespread public usage of mobile phones, 11) Infrastructure management, 12) Level of prudent practices, 13) System access, 14) Strategy, 15) IT capability, 16) Signal connection gateways, 17) Private sector cooperation, and 18) Legal issues.

V. RESULT AND DISCUSSION

As mentioned, this research involves in-depth interviews of 15 experts from five fields with three experts from each. After collecting and digesting data from the interviews to work out solutions for our research objectives which will be part of a transformation framework of moving the entire government sector to m-Government with a guideline on implementation that will contribute to following results:

A. M-Government Transformation Framework

The result of the research conducted in accordance with the process detailed in Section II shows that almost all experts agreed to stick to the internationally and academically accepted principles dealing with enterprise transformation. It is concluded that their opinions are consistent and in line with principles referred in [11] with experts from the policy and strategy group proposing that the adopted process should be implemented using a 10-step approach derived from academic research.

The process of the 10-step implementation from [12] will subsequently be presented under a sub-heading and the research results will be accompanied by a proposal to adopt the FAST matrix displayed at The World

Economic Forum Global Agenda Council on the Future of Government in [13] as part of the transformation framework.

Accordingly, the research results will help us propose a m-Government transformation framework as illustrated in Fig. 3.

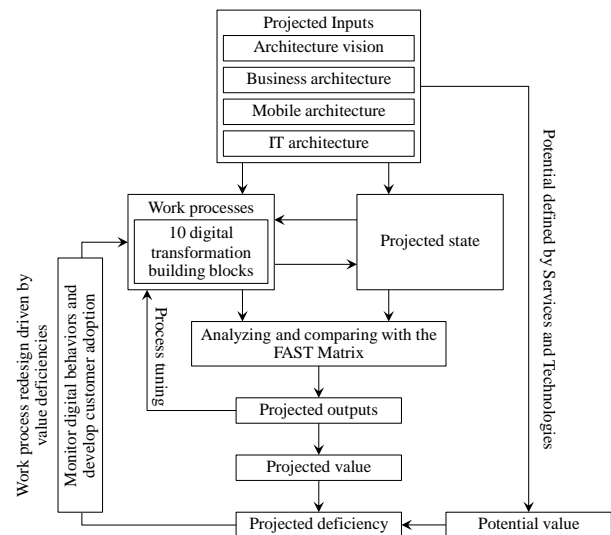


Fig 3. The Proposed M-Government Transformation Framework

B. Recommendations: Implementation

This research shows that for any country to move to a m-Government, it would need a transformation model to make a smooth and sustainable transition. For the government, it would need to take following major transformation steps: using digital technology in the process, undersize staff, raise digital channel investment, adopt adjustable local office networks, launch new digital technology services to help people and staff adjust to the digital age, and importantly run projects that are ready to embrace changes of corporate cultures. Therefore if the public sector can materially provide basic but comprehensive online services that are efficient, cost and time-effective for government and private sectors as well as for the general public, then they can help those already with access to the Internet and mobile phones to move further to a m-Government environment. In other word, the development of m-Government also entails a key role of facilitating law and regulation reforms at various different entities to prepare them for new technological changes and

upgrade competitive standards to meet challenges from those of developed countries, regardless whether these involve business supervisory or financial aspects of the services. All these, if achieved, can greatly help save time and money as well as boost the country's competitiveness in attracting foreign capital and investment.

Even though the government sector has been successful in developing m-Government, the latter cannot fully replace e-Government. Although wireless devices have their easy accessibility as an advantage which is especially suitable for mobile phones, many wireless devices are not ideal for transmitting complicated and large volumes of data. Moreover, development of highly complicated wireless devices often have compatible software constraints that hamper their proper performances especially when compared to connection with conventional desktop computers or with software designed specifically for wired devices.

However, the positive features of mobile technology allow governments to greatly expand public services to cover more areas previously inaccessible, increase channels of communicating with people and the private sector, boost service efficiency, cut operating costs, and boost government-to- government contacts.

For the ordinary people, m-Government improves quality of life through easier, time and cost-saving access to government and private sector data and services, even for people in remote and inaccessible areas. The deployment of m-Government by state agencies in legislative, judicial and administrative branches improves efficiency of internal management in these entities, raises quality of services for the general public, and promotes greater social equality.

VI. CONCLUSION

The fast, frog-leaping development of mobile communication technology boost individual power of accessing data and

knowledge. Information affects management of public services that people get from government agencies which need to constantly improve performances and efficiency, upgrade devices and equipment that open up channels for real-time public-private participation, and give people more direct access to government services. Similarly, the public sector also needs to upgrade itself to serve the general public in real-time.

This research explains the necessity for governments to undertake transformation from traditional communication services to ones that can respond in real time to the needs of the general public, and propose a m-Government transformation framework as well as an implementation process to achieve a successful transition to m-Government.

REFERENCES

(Arranged in the order of citation in the same fashion as the case of Footnotes.)

- [1] GSMA. (2015). "GSMA Intelligence Report". The Mobile Economy 2015.
- [2] Tugba, H. and Hayriye, S. (2012). "Mobile Government in the Context of Citizen Oriented Administration: A General Assessment Regarding the Practices in Turkey". Current Research Journal of Social Sciences, Vol. 4, pp. 415-424.
- [3] Mohammad, A., Elrehail, A., Hamzah, H., and Al Shibly, H. (2013). "Mobile-Government: Challenges and Opportunities Jordan as Case study". International Journal of Business and Social Science, Vol. 4, No. 12.
- [4] Farshid Ghyasi, A. and Ibrahim, K. (2004). "M-government: Cases of developing countries". Mobile Government Lab (mGovLab).
- [5] Ibrahim, K. and Halid Kuscu, M. (2003). "From E-government to M-government: Facing the Inevitable?". in the proceeding of European Conference on E-Government (ECEG 2003), Trinity College, Dublin.

- [6] GovDelivery. (2013). "Top 2013 Trends for State and Local Government".
- [7] Kumar, M. and Sinha, O.P. "M-Government Mobile Technology for e-Government". Computer Society of India.
- [8] World Economic Forum. (2012). "Future of Government - Fast and Curious". <http://www3.weforum.org/docs/WEF_GAC_FutureGovernment_2012.pdf>.
- [9] Kushchu, I. and Kuscü, M.H. (2003). "From E-government to M-government: Facing the Inevitable". mGovlab, <<http://unpan1.un.org/intradoc/groups/public/documents/apcity/unpan045367.pdf>>.
- [10] Al-khamayseh, S., Lawrence, E., and Zmijewska, A. (2007). "Towards Understanding Success Factors in Interactive Mobile Government". Sydney: University of Technology.
- [11] William, B.R. (2005). "A Theory of Enterprise Transformation". Systems Engineering, Vol. 8, No. 4.
- [12] Digital Transformation in 10 Building Blocks. (2012). <http://www.efma.com/ressources/studies/2012/1-JXVJ0_E_qstudy.pdf>.
- [13] Future of Government - Fast and Curious. (2012). "World Economic Forum". <http://www3.weforum.org/docs/WEF_GAC_FutureGovernment_2012.pdf>.
- [14] OECD/International Telecommunication Union. (2011). "M-Government: Mobile Technologies for Responsive Governments and Connected Societies". OECD Publishing.