DIGITAL LAGS AND CHALLENGES IN E-GOVERNMENT DEVELOPMENT IN DEVELOPING VERSUS DEVELOPED COUNTRY: A COMPARATI STUDY BETWEEN VIETNAM AND SOUTH KOREA

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Abstract:

Based upon several reports of United Nation in e-government recently, we analyze and pinpoint the development lag of developing countries versus developed countries in the field of e-government. We consider two countries as a comparative case study, the developing country Viet Nam and the highly developed country South Korea. In this paper, we also find the drivers for the 1st position of South Korea and barriers and challenges of Viet Nam in e-Government developments. At the end of the paper, we address the recommendations for Korea to be constantly at its position and for Viet Nam to leap up from the existing position.

Keywords: *E-government, development lag, developing country, developed country, index, United Nation*

1. Introduction

In the e-government field, The United Nation Survey Report is one of professional references based on objective indexes to assess the e-government development level of every nation in every two years. In 2012, The United Nation Survey Report 2012 – E-Government for People was released in which there is a new list of relative development indexes in e-government for every country in the last two years. The report is a unified and specific reference for every nation to change and plan the vision for highest development in short term and long term as well. Surprisingly, some nations had all increasing individual indexes,

but they moved down to lower position in the final list. However, some nations have done their good job and moved up to a higher

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position. That is the relativeness of the report because of many different reasons such as the changing of so-economic situations and conditions of every country. Moreover, the basis of UN assessment is different in different years. That causes the relative changes in the final list as mentioned above.

In 2008, the theme of the report was "From E-Government to Connected Governance". The report focused its assessment on the penetration of e-government development into national governance. This time, Sweden was at the 1st position in the final list of achievement. However, Republic of Korea which was at the 6th position in 2008 leaped up to the 1st position out of 184 countries in 2010. The 2010 report theme was "Leveraging e-Government at a time of financial and economics crisis". It showed that, even in a crisis period, Korea still had a big and strong improvement. In 2012, the report focused on "E-Government for People" with a special emphasis on expanding online services towards its citizens. Nevertheless, Korea has still steadily hold its 1st position out of 193 nations around the world closely followed by Netherlands, United Kingdom, Denmark, United States and France. On the other hand, Korea has achieved its recognition as the top leading nation in "e-government participation index". This reflects on President Lee Myung Bak administration's proactive implementation of "Smart Government Strategy as a next generation of e-Government". In the case of Viet Nam, its position was at 91st in 2008 and moved sluggishly up one-step to 90th in 2010. Nevertheless, after that, Viet Nam has jumped up to the position 83rd, which is six-step improvement in the final list of 2012 report. In the objective and relative perspectives, Korea proves a constant effort to improve, invent new ideas for development and firmly hold its position. It is more difficult for the developed countries to maintain their high-class positions. Viet Nam also had a jump in 2012 after a slow progress from 2008 to 2010. This shows an effort to change in the policy and action for development of this nation even in period of global crisis.

The up and down movement of every nation in the e-government development index table indicates a lot of competition between different countries in different aspects of e-government development. On the other hand, it gives lot of space for the researcher to think on it. The different reasons of the lags of the least developed and developing countries compared to developed countries has been mentioned in several publications. The big gap between developed countries and developing countries are due to the differences on culture and history, technical staffs, infrastructure, citizens and government officers [5]. Similarly, Thuy-Nga Hoang [1] has presented the current states of Korea and Viet Nam in e-government development, and discussed the reasons of the differences, lessons learned and solutions for Viet Nam as well in the author's thesis. In this paper, we extends those above explanations and analyses to identify couples of more reasons for the lags that would be the basis and implicit reasons behind these up and down among countries.

In Section II, consider Korea case. We highlight the successful factors in subsequent sections. In Section III, we consider the Viet Nam case and perform the analysis in Section IV. We find the implicit causes for not getting developed in e-government in Viet Nam in Section V. We provide the recommendations

for both Viet Nam and Korea in Section VI and finally conclude in Section VII.

2. Korea: the number 1

South Korea is a developed country surfacing in the last decade. This nation is now very prosperous and attractive in all aspects of society. In the last decade, the rapid economic development has boosted South Korea to many different champions in technology, economy, education, etc. Life quality of every citizen has been developing impressively. The gross domestic product based on purchasing-power-parity (PPP) per capita GDP is double-shoot in a decade from around 16,000 USD in 2000 to around 33,000 USD in 2012. Recently, Korea has scored big champions and achievements in the field of information and communication technology and especially smart devices.

Korea has been successfully building up its extraordinary e-government system in a unique way with very strong steps and clear visions. In 1980s, Korea completely constructed the National Basic Information System (NBIS) to be the basis infrastructure for Korean e-government and it has been updated and upgraded until now. In sequence, a bunch of key e-government projects was thoroughly performed and followed by the "Participatory Government" that is realized through 31 e-government road maps projects from 2003 to 2007. Korea established a strategy for e-government towards ubiquitous government called "Master Plan for the Next Generation e-Government (2008-2012)" accompanying with the national ICT program "U-Korea Master Plan (2006-2010)". Moreover, the next generation of e-government that has been defined by President Lee Myung Bak is the "smart government".

Standing on a strong infrastructure and moving every successful step along with very clear vision, Korea has always achieved different successes in e-government right from the beginning. The United Nations E-government Survey every two years simply shows this. Korea is always in the highest positions out of the whole nations in the world. In 2006, it was in 5th position, then 6th in 2008 and leaped up to 1st position. Moreover, Korea does not sleep on its success. Korea still keeps moving up and maintaining its highest position in 2012. Behind the direct and explicit reasons such as culture and history, infrastructure, citizens, etc. we identify few basic and implicit factors for Korea successes in e-government development. These factors could also be the reasons of the lags as well as challenges for developing countries.

2.1. Effective and powerful leadership

Leader generations in Korea are very effective, powerful, self-motivated. History proves that at every development period the role of governmental leaders is critical and decisive. In the dawn of personal computer generations (1980s-1990s), national leaders had courageous and lucid decisions to build a "National Backbone Computer Network". It is this decision that constructed the very early and underlying infrastructure for the country to achieve constantly other successes in the future. In the early 2000s, the world of mobile devices was surfacing as a new technological world and very hot topic for research and development in every developed nation. Grasping this trend, the governmental leaders of Korea again made a proper decision in

order to adopt and upgrade the e-government system towards a new trend by implementing a mass of e-government projects. Today, when a new technological wave of the world again is coming in which many scholars believe that the future picture of the technological world is the world of mobile computing based on smart devices. The Korean leaders immediately draw a new picture for the national government towards a smart, interoperable and global government. Obviously, strong leadership plays a significant role in every development milestone. This seems to be a challenge for other developing countries where many issues in governmental system still exist.

2.2. Smart explosion

Ten years ago, people are too familiar with desktop and personal computer for works. There were very few smart devices in Korea. The picture of e-government foundation was so blurred, unclear and ambiguous. However, the country is lucky enough to implement so many e-government projects in the situation of globally smart explosion happening. This smart explosion brings smart devices such as laptop, tablet, smart phone, high-speed and new generation telecommunication network, new concept of computing. Following right from the beginning of international technology trends, Korea has constructed very strong infrastructure in Information and Communication Technology (ICT) facilitating Korea to closely adopt new trends and rapidly upgrade and change to new concepts or technological generations. This fosters Korea to create innovations and stand in the top of leading countries in ICT. Taking those nutritious advantages, it is much easier, faster and more sustainable for Korea to be successful in implement e-government projects. For developing countries, smart explosion of technologies could be nutritious advantages but in other face, it would be more challenge for adopting.

2.3. Thorough understanding e-government architecture

With the high level in education along with the great investment and plan on research and development (R&D) as well as the huge workforce of researchers, Korea masters the e-government architecture. It makes a good evaluation on every component supporting the e-government system and put a good care on the proper development for that component. In particular, Korea focuses on the improvement and development of several main components of e-government architecture such as *Web Measure, Telecommunication Infrastructure,* and *Human Capital*. By this good consideration, Korea synchronously builds up main components then enhances e-government development quickly. To enhance the e-participation, Korea has implemented several different national projects as well as many other ideas to attract more and more people to involve in e-services including e-information, e-consultant and e-decision making. Korea has not dealed with any confusion or ambiguity in term of contents in those above components of e-government development. Accompanying with that, Korea has always made a clear and thorough plan in developing, adopting and upgrading these components. This is one of the typical factors for Korea's strong success in e-government development.

2.4. Identification of reasonable needs

Unlike most of the countries around the world, Korea has clear understanding on

what it reasonably needs for e-government development in every single step. Based on that, Korea tries to figure out carefully the exact requirement for proper development, explore the relevant area to achieve the need and requirement. Especially, technology is always the highest need in order to boost up dramatically the e-government system. Hence, Korea identifies the areas of investment for effective e-government in term of technology such as building high-speed national network like Wibro (Wireless Broadband) nationally launched in 2006 and LTE (Long Term Evolution) broadly launched in 2012. Another example for this factor is smartphone industry. Korea has adopted quickly the technology trends in the world to build up a very big and mass smartphone industry. Korea understands this technological development would be a very favorable advantage for innovations in e-government and other related areas. These big business and investment have leveraged Korea to one of the best countries in providing Internet facility as well as high-speed telecommunication in the world.

2.5. Positive and creative mind

In Korea, though the life style is very busy and stressful every day but Korean people are still very active, positive and creative in their daily works. These characteristics provides Korea an energetic motivation to develop dramatically in all aspects of socio-economy. The synchronous developments in different aspects help Korea to step with very strong and fast step in e-government development.

2.6. Following Best Practices

Following the best practices in the same field always is a guideline for a nation to quickly achieve the objectives of e-government. Korea has identified and analyzed the best practices in many different benchmarking analyses and study lessons learned, implement in a proper and simple modification corresponding to the current situation of the country. Korea always tried to learn from the top nations like USA, Sweden, Scandinavian countries, etc. when it was not in the top position. Learning from the best and using immediately make Korea always on top.

2.7. International propagation

Korea has been successful in propagate its culture into the world with so many positive influence. It is so strong influence that people consider it as a Korea wave called "Hallyu". This is no exception in e-government field. Korea has been now the top leading country in the world. It is this number 1 position that Korea is doing its mission by propagating and bringing abroad its marvelous achievements to other countries especially to least developed and developing countries. However, this propagation is also helpful for Korea. Korea will have more practical experiences and lessons learned for reformation and modification of its future e-government model.

2.8. Intra-domain and inter-domain collaboration

Intra-domain and inter-domain have been considered right in the beginning of e-government era in Korea. Korea has been very smart and flexible in establishing and constructing strong collaboration in domestic and international organizations. Korea has been working with many different domestic and international agencies in the field of e-government. However, we take here only few of them.

a) Domestic collaboration:

NIPA (National IT Industry Promotion Agency) is a governmental agency in charge of supporting the nation's e-government projects with clear vision and mission. Its well-identified major functions are such as study of IT policy, educating IT workforces, promote ubiquitous industry and many more.

NIA (National Information Society Agency) also has been helping the nation in the research of IT penetration, Infrastructure status, successful factors etc. Its functions have provided very clear guidelines for the policy and decision maker.

KOICA (Korea International Cooperation Agency) has not only supported the country but also helped the developing countries through inter-nation programs in order to enhance the effectiveness of nation's grant aid programs.

b) International collaboration:

One of the core factors that enables Korea to achieve quickly its successes is international collaboration. Korea has very good and strong relationships and constantly in touch with experts group in the field of e-government from different countries, university and organizations like from United Nation University, European Union and United Nation. These special international relationships bring to Korea many helps to carry out joint research and together solve any issues.

2.9. Moving from E-government to I-government and M-government

Korean government has built up the connection and link between various government organizations to be under one umbrella. Their purpose has been moving from isolated e-government to integrated government (i-government). To realize this purpose, Korea has developed and implemented an Enterprise Architecture. For instance, Korea has built an e-government portal (www.korea.go.kr) in order to provide customized and integrated services to all citizens throughout the country. Recently, the smart explosion has been occurring. Korea considers this as a golden opportunity to enhance the current e-government architecture into i-government as well as to build-up a new e-government architecture towards mobile government (m-government). It has been going on.

2.10. Future generation consideration

To propagate, maintain and develop its achievements to its new generations, Korea has motivated any citizen to use Internet for their daily life anywhere, anytime. In order to prepare for new vision in coming days, Korea has oriented its student right from elementary school to utilize and discover the technological achievement that their parent have been contributing to the country. For this, Korea has tried to create and penetrate ICT environment to each level of school by providing broadband connection in every school. This gives student opportunities to experience and to be aware with ongoing technology. However, in other hand, the country can create the human resources for future development at the same time.

3. Vietnam: slow moving

Viet Nam is a South-East Asian and developing country. It just has involved in developing country list since 2010. This country has been imposing the historical war's consequences as a burden on socio-

economic development in the post-war period. One typical characteristic of Viet Nam is the agricultural country. Even though, Viet Nam has many strategies and plans to modernize and industrialize the country, the agricultural nature is still inherent in society. On the other hand, Viet Ham has a quite long territory with different kinds of terrain including mountainous, highland, plain, sea etc. areas. The nutritious but diverse terrain troubles the country in spreading governmental services to people, especially in the rural and remote areas. This is a geographical challenge to develop e-government through out the country. However, e-governance offers the distinct possibility of effectively streamlining the delivery of governmental services. Moreover, Viet Nam has a favorable literacy rate for e-government development at about 92.8% in total population in 2011 as reported in UNDP. Viet Nam has about 18.9% population below poverty line. Average income is near about 150USD/month that is still far lagging behind the income per capita in ASEAN countries and China.

Viet Nam started e-government with vision of bringing the government closely to people, making value networking Viet Nam through citizen-centered service, transparent service, networked government and knowledge based society. The effort of developing e-government system has been tried since early 2000s. A significant work has been done such as feasibility study, master plan, establishing of IT Park, drafting IT policy, establishment of data center and many more. Despite all these, the country has achieved very less. As per the UN report, it was in 91th position in 2008, stepped slowly up to 90th position in 2010 and now moved to 83th position. Even though there has been a progress so far, but still few of tele-centers are built up in the country. On the other hand, most of the governmental organizations have web site with very less digitized documents. These are very less development as compare to the time-frame of one decade. There has been so many documents published to figure out the reasons such as technical papers, articles and reports but unfortunately, most of them came to the conclusion with general points and awareness and IT literacy considered as the reasons. These are may be the reasons but not prime root causes. Here, we identify the main root cause of this problem but before that, we do analysis in next section and try to find the root reasons in respective section.

4. Analysis and benchmarking

In this section, we do an analysis of Viet Nam and Korea. We use the formulas of e-government development index (EGDI) [11] as follows:

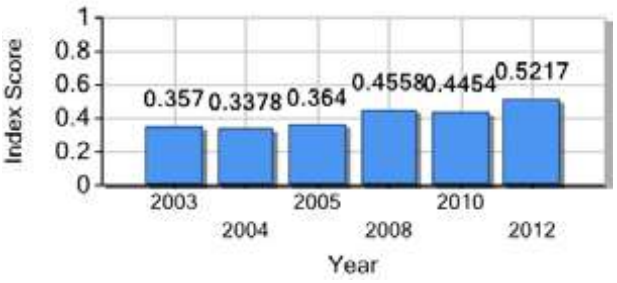
$$\begin{aligned} EGDI = {} & (⅓ * \text{online service index}) \\ & + (⅓ * \text{telecommunication index}) \\ & + (⅓ * \text{human capital index}) \end{aligned} \quad (1)$$

Mathematically, the EGDI is a weighted average of three normalized scores on the most important dimensions of e-government, namely: scope and quality of online services, development status of telecommunication infrastructure, and inherent human capital [11]. Hence, we evaluate e-government development based upon EGDI along with those above main parameters including online service index, telecommunication infrastructure index, and human capital index.

Table1. Viet nam e-government development indexes (2008-2012)

No.	Parameters	2008	2010	2012
1	Online Service Index	0.4448	0.3048	0.4248
2	Telecommunication Infrastructure Index	0.1081	0.2260	0.3969
3	Human Capital Index	0.8150	0.8097	0.7434
4	E-Government Development Index (Total)	0.4558	0.4454	0.5217
5	Rank	**91**	**90**	**83**

Figure 1. Viet Nam E-Government Index Trend (2003-2012)



The Table I reflects clearly the competitiveness and relativeness of UN E-Government Development Index List. It depicts three main parameters including online service index, telecommunication infrastructure index, human capital index and E-Government development index with their respective values in 2008, 2010 and 2012. It provides a good insight of the e-government development in Viet Nam. First, we assess the e-government development index. Even though, this index decreased from 0.4558 in 2008 to 0.4454 in 2010 (-0.0104 down). However, the rank in the countries list moved from 90 to 91(one position up). Inversely, the e-government development index has moved up from 0.4454 in 2010 to 0.5217 in 2012 (+ 0.0763 up) and in consequence, the rank has jumped 6 positions up from 90 in 2010 to 83 in 2012. It is quite strange if we only focus on the number without considering its meaning. Because the index decreases but the rank steps up, and as the index increases a little then the rank jumps up further. It reflects the diverse changes and relative and competitive relations between nations in the survey every couple of years. Even with decreased index of e-government development from 2008 to 2009, the rank of Viet Nam still moved up. That means the rate in e-government development of other countries was lower and even going down in this period because of economic recession beginning in 2008. In addition, Viet Nam economy was less influenced compared to other countries in the world. Hence, in comparison to other nations, the rank of Viet Nam in e-government development moved up in the period of 2008-2010. Moreover, the other indexes have experienced different changes compared to each other. The online service index moved down from 0.4448 in 2008 to 0.3048 in 2010 and then it has recovered a bit to 0.4248 in 2012 but still stayed behind compared to 2008. This reflects the slow progress of the citizen online services in four stages as mentioned above including emerging presence, enhanced presence, transactional

presence and connected presence. Viet Nam has offered services in stage I, around haft in stage II, and a third in stage IV but only 17 percent in transactional stage [11]. In another component, the status is different. Human capital index has continuously moved down over the years from 0.8150 in 2008 to 0.8097 in 2010 and 0.7434 far behind in 2012. Because this index relies on the UNDP Education index. This is a worthy proof of the current situation of education system and ICT penetration into society. The fact shows that the education system in Viet Nam is not so steady and not high in quality in relative comparison to many other regional and international countries even though it has been slowly progressive. Conversely, in the telecommunication infrastructure it has gone up year to year from 0.1081 in 2008 to 0.2260 in 2010 and about four times up to 0.3969 in 2012. This proves that Viet Nam has been investing and building up its basic infrastructure for e-government development as in its development master plan or strategies issued from government. This increasing trend of telecommunication infrastructure is a good explanation for the impressive going-up in raking in 2010-2012 even though other components had no steady growth. Figure 1 depicts the e-government development index changes over the years from 2003 to 2012. Viet Nam seems to have no steady development, up and down through year to year. However, the improvement and progress trends are obvious. In the period of 2008-2012, the global economic recession occurred hence Viet Nam was also influenced in all aspects of socio-economic systems. That is why the e-government development index was down in 2010 and then recovered in 2012. Table II shows the comparison among the overall Asian countries, Korea and Viet Nam over the years 2010 and 2012. We compare the values obtained by Viet Nam and Korea with the average values of Asia. In 2010, Viet Nam is close ahead Asia in telecommunication infrastructure and human capital components but a bit lag behind Asia in online service component. However, totally Viet Nam stayed a little gap above Asia. In the same year, comparing to Korea, both Viet Nam and Asia stayed quire far behind Korea in all indexes. After 2 years, all the index values have changed following a rising tendency. Surprisingly, the comparative relations among Asia, Viet Nam and Korea have remained. In particular, Viet Nam has closely accompanied to Asia, stayed a bit behind in online service component but ahead in telecommunication infrastructure, human capital components and total e-government development index. Obviously comparing to Korea, Viet Nam has still stayed far behind. Considering all index values of Korea, we find there are big changes in all components. All index values have increased about three or four times. Moreover, all index values are very high compared to all other countries and even themselves in 2010. Especially, the index value of online service component in 2012 has reach the maximum value 1.0000. This means the online service component with all its subcomponent have been delivering perfectly to citizens in the scale and perspective of United Nations organization in 2012. To see the comparative relations between different components in the case of Viet Nam over years, we plot Figure 2. We find a clear tendency in e-government development of Viet Nam that is the synchronous development across components has been going on. We also plot the data in

the year 2012 of the Table II in Figure 3 to have a clear picture of the gap. By this way, we can see the above reasonable analysis. In addition, we can see the huge gap between Viet Nam and Asia compared to Korea. Korea has been impressively flying far above Viet Nam and Asia. We also can see that although Viet Nam has achieved good improvements and progresses and Korea has remained its number 1 position, Korea has been dramatically developing in all aspects and Viet Nam has been slowly moving up. This is obvious lag between the developed country and developing country.

Table 2. Comparison between average regional and global countries, korea and viet nam in 2010-2012

No.	Parameters	2012				2010			
		Asia	Korea	Vietnam	Gap	Asia	Korea	Vietnam	Gap
1	Online Service Index	0.4880	1.0000	0.4248	0.5752	0.1085	0.3400	0.1036	0.2364
2	Telecommunication Infrastructure Index	0.2818	0.8356	0.3969	0.4387	0.0657	0.2109	0.0746	0.1363
3	Human Capital Index	0.7278	0.9494	0.7434	0.2060	0.2659	0.3277	0.2672	0.0605
4	E-Government Development Index (Total)	0.4992	0.9283	0.5127	0.4156	0.4424	0.8785	0.4454	0.4311
5	Rank		**1**	**83**			**1**	**9**	

Figure 2. E-government Development Indexes of Viet Nam in 2008, 2010 and 2012

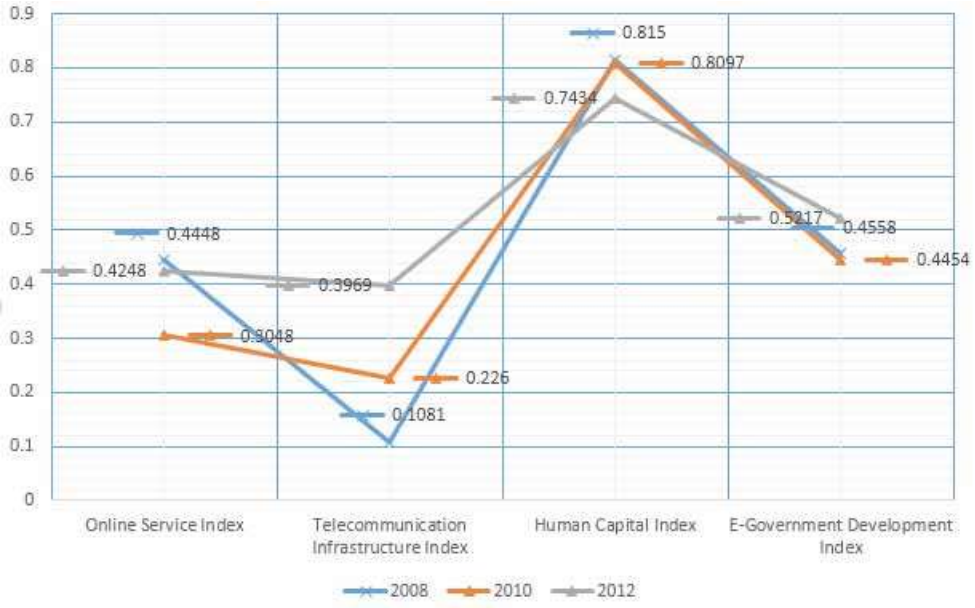
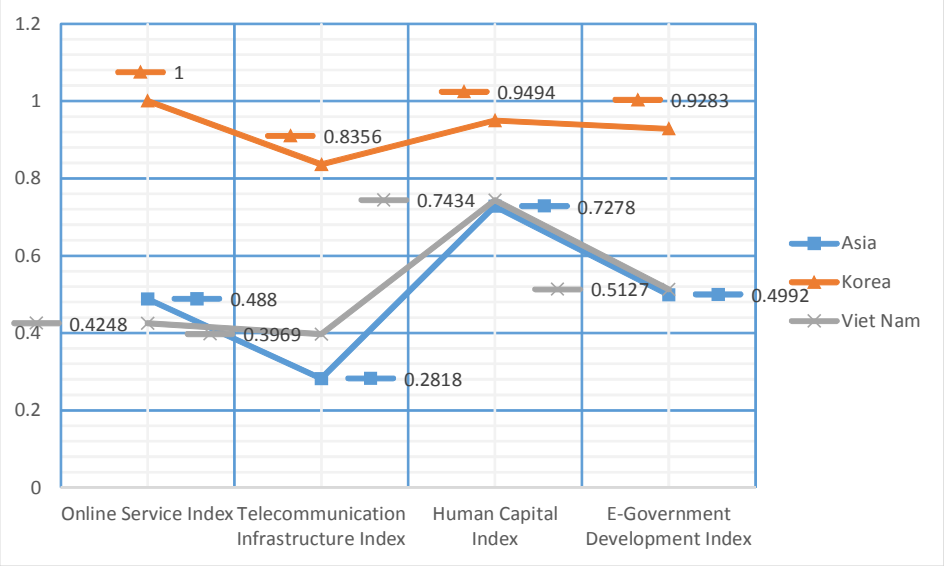


Figure 3. E-government Development Indexes of Asia, Korea and Viet Nam in 2012



5. Implicit cause

5.1. Ambiguous requirements

There are so many needs in the country to be solved through e-government system. Unfortunately, still they do not know what they need. They sometimes try to follow Indian pattern and immediately they change to Korean pattern but again they look for other patterns rather than implementing one.

5.2. Working style

Working style is not good at all in Viet Nam especially in government offices. It is based upon the hours. Employees really work from 10 AM to 5 PM i.e. 7 hours in a day. It shows 29% of time in a day they work, which is very less as compare to other countries. In winter, even this is less because most of the employees enjoy bright sun outside the office in a daytime rather than working inside. In Korea, it is entirely different. People work from 8 AM to 8 PM i.e. 12 hours a day and 50% of time in a day. In most of the organization, they even work more than 12 hours a day. The country like Korea needs these many working hours in spite of being developed country, Viet Nam needs more than this. In addition to this working culture, employees in Viet Nam do not have any threat of losing job. They consider the government job as guarantee where as in Korea if you do not perform well you should be ready to be kicked out.

5.3. Weak and Unclear Expertise

In Viet Nam, it looks there are pool of expertise. Nevertheless, unfortunately, the number of people who are deeply involved in any area is very low. Let us take couple of examples. It is very clear that Enterprise Architecture is required but principles and details are still not clear. They know security is required, they know few terminologies like digital signature, cryptography, cipher etc. but the details are still not crystal for them. There are very few real experts. They are expert in one domain not in all. These few experts try to cover up every domain. An expert in security is equally treated as an expert in architecture and vice versa. This is the blunder. In Korea, an expert in one domain is not allowed to give any comments or suggestions on another

domain. They can attend the discussion but their views and comments are not accepted. It clearly shows that Korea has identified their local resources and categorizes them as per the domain and explores the international resources if it is needed whereas Viet Nam is still far behind on it.

5.4. Trustless

Trust is one of the binding forces in e-government. There should be trust among the main actors in e-government system like trust between government and citizen, trust among government organizations trust between government and international donor or communities. In Viet Nam, we find the lack of trust among the actors. There are many doubts among themselves. It has become very common to make doubts to others without proper analysis and study. There is no proper mechanism to distinguish between well-wisher and not well-wisher.

5.5. Plan and strategy without practical implementation

There is well-documented e-government master plan in which vision and mission are clearly defined but implementation ratio is very low.

5.6. Management system issues

In Viet Nam, there are many issues in the management system in all level. This is a big challenge for Viet Nam to overcome. Corruption is a big issue of the government system. Even though, government always commits to prevent, avoid and punish whoever have a symptom of corruption. But there seems a hidden life behind government. Besides, bureaucracy of officers is another problem of the system. People working in public sector is not whole-hearted in works as well as in serving citizens especially in public administration. This is entirely different in Korea.

6. Recommendation

6.1. What should Viet Nam seriously change to leap?

a) Action oriented work

The working style should be "Action-Oriented" rather than "Hour Based". The hire and fire should be based on the action of employees. Each employee should be involved in project and his continuity in job, promotion and reward should be based upon his output and performance.

b) Mutual trust

There should be trust among all e-government stakeholders. There should be any fair and doubt in information sharing. There may be some sensitive information and such information can be secured or protected by unauthorized users but there is much sharable information and can be shared. Moreover, trust between country and international organization is the important. Without proper trust, none of the international organizations would be ready to help the nation.

c) Human resources

None of the countries in the world is capable of providing enough local expertise in the initial stage. Even Korea, they did not have enough local expertise during 1990s but they had a clear policy in identifying their local expertise and inviting expertise from other foreign countries as per the need. Viet Nam also can follow the same pattern and policy in identifying the local experts and inviting experts from other countries. There

are so many experts and organizations willing to help outside Viet Nam. The only thing is Viet Nam should know what types of expert it needs and for how long. In Korea organization like NIPA [National Information Promotion Agency], NIA [National Information Society Agency], and KOICA are always ready to help Viet Nam in any parts of the e-government system. Like Korea, there are other countries as well to help Viet Nam.

d) Cultural issues

There is a gap between culturally, socially dominated people and technology. Being a developing country, most of the people in Viet Nam are not comfortable in using technology in their daily works. They still have a notion that only westerners can use technology. Therefore, there is a need of removing such thoughts from them and try to make them comfortable in using technology and convince them technology is for everyone.

6.2. What should Korea do to continuously maintain its 1st position?

It is true that one needs huge efforts to be number 1 but more efforts are required to maintain the first position. Korea has now more challenge to maintain its position in number 1. In order to remain in number 1, Korea has to do following things. We provide such solutions as recommendation. It is based upon our analysis. We categorize the challenges into two parts as major and minor challenge.

a) Maintaining index values (major challenge)

As per the UN report, the index values of first 6 countries are very close. Korea is ahead Netherlands only with 0.0158, which is the big threat to Korea to maintain this difference. Apart from this, Korea is behind in telecommunication infrastructure component with Denmark with 0.0001, which is not big difference, but it can be expanded and even the countries like Netherland, Norway are very close to Korea. Korea is at lowest position in human capital component among first 6 top countries in the world. The difference between human capital component of Korea and Netherlands is 0.0421 that is the big gap. It shows Korea needs to work more on human resources and increase telecommunication infrastructures. In order to get these, the following things are needed.

b) Maintaining human capital index

Human capital index is one the parameters to evaluate the nation's position in the development of e-government. As it is mentioned above Korea is behind on this parameter as compare to other top 6 countries in the world, there is a dire need for Korea to think on it. As per the UN, the human capital index is a composite of the adult literacy rate and combined primary, secondary and tertiary gross enrolment ratio. Despite the high literacy rate, it is recommended that Korea should emphasize on these units of human capital index thoroughly.

c) Increase connectivity and interoperability (minor challenges)

Connectivity is one of the sub-components of the telecommunication infrastructure. Despite the 81% houses are connected and 70% people use Internet for daily use, Korea has to try to increase the more connectivity and Internet users. The connectivity data shows very interesting now but for a long run, it will be very big challenge for the government because 19% not connected houses and 30% people who are deprived from using Internet

make sense a lot in e-government services. Here also Korea needs to think it more dynamically to remain in first position

d) Move to G-government

G-government stands for Global Government. ICT does not believe in the boundary. Now there is no boundary between any two countries. A citizen from one country should get the service from other country and vice versa. If we are reluctant in moving toward global government then our progress and development in e-government is ended. Now the time has come to think of the entire world especially Korea, being number 1 in the world has to think and work seriously about it. We identify Korea has emphasized more in G2G, G2C, G2B but less work is done in G2F [Government to Foreigner]. One of the factors that Korea has achieved in e-government is adopting globalization. It is not confined within its boundary. There are various good portals for its citizen but very less portal for foreigner. So, it is strongly recommended to develop G2F in details.

e) Migration to future technology

It is said that the future technology is based upon the cloud computing. As per the various research, it is learned that cloud computing provides enormous services to e-government system. Cloud computing do offers significant features but still there are many doubts on the security issues. A research is required to be assured in security part of cloud computing. The chief information officer (CIO) of White House has already decided to move country's e-government system to the cloud-computing environment. It is recommended that Korea should take the lead role, use cloud computing for e-government, and provide the best solution to other nations.

f) Keep doing research

Since research is the best approach in identifying the problems at present and problems in future, it has to be continued. As Korea does, the outcome of research needs to be tested immediately and used in real time.

7. Conclusion

Every corner of the world has been putting its huge efforts in construction of e-government system. However, there is still a big lag of developing countries compared to developed countries. This lag and gap is getting bigger day after day because of the different speed of development. For developed countries, their huge achievements and experiences in the past are the platform to move quicker and more creative in the future. For developing countries, even though they can utilize and inherit the achievements and experiences of developed countries as precursors, they still need to change their whole lagging system to adopt new trend. Therefore, somehow the lessons learned from developed countries become their challenges. Based upon those ideas, in this paper we did a comparative analysis in order to figure out the reasons of fluctuation in moving up and down in index values in UN E-government survey over years. We have found out several root causes in which the ambiguity and unclearness in need, mistrust and working style are the root causes for this lag in the perspective of developing countries, like Viet Nam. Then we provided some solutions to reduce this lag. The influences of the culture, society and trends to the developing countries

are obviously inherent. Hence, the people of developing countries do not easily and immediately accept or adapt new technology, new system like ICT tools. To deal with such issues, we highly recommended the need of special efforts for developing nations. We also have recommended to Korea to stay constantly on top position. We figured out the challenges and solutions for both developing and developed nations.❑

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