Electronic Governance in Asia:
State of Play, Impact and Bridging Internal Divide

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Abstract

The notion of Electronic Governance as an ICT-enabled transformational paradigm for modern public administration and good governance is well established and accepted by governments - irrespective of development status and region. Presently, there are a number of international benchmark reports on the global e-governance landscape. Understandably, these reports seldom provided detailed picture or analysis on any specific country and regions to enable concrete actions for policy and decision makers. This paper attempts to provide deeper insight into the e-government landscape in Asian region. First, the paper highlights the state of e-governance in Asia – regional competiveness and intra-regional performance. Second, it determines the structure of the existing e-governance divide in the region from two different perspectives, at sub-regional and country levels. Third, the paper investigates the possible impact of e-governance on the quality of governance in terms of: (i) voice and accountability and (ii) government effectiveness in the region. Our results show significant divide between sub-regions, particularly in the area of e-participation. In addition, results also reveal strong positive correlation between e-readiness indices and government effectiveness indicators of countries in the region. However, no relationship could be established between the e-participation indices and the voice and accountability indicators for countries in the region. To address the divide issue and the overall regional capacity in e-governance, we propose concrete strategies partly based on patterns of strategies of leading countries in the region. Finally, to increase intra-regional knowledge sharing and collective actions by Asian countries in e-governance, we suggest the cultivation of Communities of Interests made up of countries of similar development status, challenges and priorities to complement the usual top-down regional and sub-regional actions.

Keywords: Electronic Governance, Good Governance, E-Governance Divide, Communities of Interest

1. Introduction

Electronic Governance, abbreviated as e-governance, seeks to exploit Information and Communication Technology (ICT) for transforming the internal workings of public organizations towards more efficient and effective public service delivery and managing external relationships with government stakeholders (citizens and businesses in particular) towards greater engagement and participation in policy and democratic processes. Therefore, e-governance as the strategic application of ICT in government covers: efficient internal operations of government, public service provision and democratic processes [2]. The view of e-governance as an ICT-based transformational paradigm for public administration and management is well established and accepted globally. Transformational initiatives are usually implemented as part of an overall Government Reform Program. These reform programs mainly aim to achieve governments that: costs less, deliver high quality personalized services, comprise a professional civil service, can leverage ICT strategically, have better regulatory capacity, and are honest and transparent in governance [6][13].

In addition to supporting fundamental reform programs of government, e-governance initiatives are increasingly aligned with core socio-economic and development goals to enable concrete public value creation. Therefore, while general international benchmarks for measuring progress in e-governance at various levels of government, e.g. national and municipal levels are useful, varying socio-economic and political contexts of the countries strongly informs the need for local perspective to analyzing requirements and impacts of e-governance initiatives.

In the last decade, the Asian region in general has witnessed robust economic growth, stronger fiscal management, increased foreign direct investments, increased literacy level and improved delivery of social services to citizens [20]. The region (including the Pacific) has also witnessed significant growth in its ICT infrastructure, particularly in terms of mobile cellular users; increasing from less than 5 subscriptions per 100 inhabitants in 1997 to 36.6 per 100 inhabitants in 2007 [3] and increased pervasiveness of broadband networking [20]. At the same time, a number of challenges remain to be addressed in the region, particularly in the areas of income inequality among citizens, infrastructure and environmental conditions. In fact, despite the impressive growth in ICT infrastructure in the last decade, the region's broadband penetration is still low when compared with other regions such as Europe and the Americas [15]. These achievements and challenges provide a context for e-governance in Asia.

This aim of this paper is threefold. First, to examine the state of e-governance in the region by looking at the relative performance of the Asian region based on UN e-Government Readiness benchmark reports (arguably the most authoritative source of e-government benchmarking data) from 2004, 2005 and 2008 [17]. Second, it determines the patterns of e-governance divide between sub-regions and individual countries in the region. Third, the paper analyses the possible impact of e-governance development in the region on the quality of governance across the region based on two Governance indicators – voice and accountability and government effectiveness for 2004, 2005 and 2008 provided by the World Bank [21].

The rest of the paper is organized as follows: Section 2 presents a short overview of e-governance. Section 3 presents the state of e-governance in Asia. The analysis of the relationship between e-governance and governance indicators is presented in Section 4, while Section 5 discusses how the intra-regional e-governance divide can be bridged. Concluding remarks are provided in Section 6.

2. Electronic Governance - Some Concepts

2.1. Definition

Many definitions have been provided in literature by researchers and major international organizations for Electronic Government. One of the simplest, yet complete, is offered by the Organization for Economic Cooperation and Development (OECD). It defines e-government as the use of ICT to achieve better government [15]. Therefore, a similar definition for Electronic Governance is the use of ICT to achieve better governance. Where better government in the OECD definition implies improved government efficiency and effectiveness and capacity for quality public services, better governance will in addition include greater capability for stakeholder engagement in policy and democratic processes. For simplicity, this paper considers both concepts synonymous.

2.2. Maturity Model

Various but very similar e-governance maturity models have been provided by international organizations such as UN-DESA [17] and OECD [15] and prominent consulting firms like Accenture [1]. These models essentially specify four major stages of e-government maturity: Information, Interaction, Transaction and Transformation.

The first stage or Information stage establishes government presence on the Internet and is characterized by the availability of numerous government websites with largely static content. The second stage or Interaction stage permits users to download content (e.g. application forms for obtaining a license) from government websites and

also permits citizens to send emails to government organizations. The third stage - Transaction allows complete transactions (including secured payment) on government websites. The fourth stage - Transformation links the back offices of government agencies and allows for seamless delivery of services. Recent reports on e-government ranking are extending the traditional maturity models to include personalization of services and attainment of connected governance as the highest level of e-government sophistication [1][18].

2.3. Strategies and Programs

E-Government strategies guide the transition of countries along the different maturity stages. These strategies essentially focus on three major areas of development [18] – Infrastructure, Integration and Transformation. Infrastructure-oriented strategies focus on the creation of Information Infrastructure both within government and in the society – including affordable Internet connection for citizens. Integration-oriented strategies address how the developed infrastructure can be leveraged for information sharing and how public services can be better delivered through bundling and integration based on citizen- and business-centric governance models. Transformation strategies specify how service innovation can be realized through patterns of networked governance and knowledge management practices.

Infrastructure and integration strategies are essential in attaining Information, Interactive and Transactional stages of maturity, whereas the transformational strategies must underpin the Transformation stage and the emerging personalization and connected governance phases.

E-Government strategies are implemented through various programs. A number of elements characterize typical e-governance programs. These elements relate to the following: e-readiness assessment, leadership, regulatory framework, human capacity development, organizational change management, infrastructure development, partnership development, data provision and information system development, portal and electronic service development, communication, monitoring and evaluation. Details of these elements can be found in [15] and [20].

3. State of E-Governance in Asia

This section presents the state of e-governance in Asia and describes the nature of the e-governance divide among sub-regions and individual countries in the region. The analysis presented in this section is based on the data provided by UNDESA through the Global e-Governance Readiness Knowledge Base [17]. Three consecutive annual benchmark data were used - 2004, 2005 and 2007/2008.

The UNDESA e-Government Survey assesses human capacity, level of infrastructure development and citizen's access to information and services in each UN member state to establish the comparative level of e-government development in the country. It computes e-Readiness Index of a country as a composite index of its Human Capital Index, Web Measure Index and Telecommunication Infrastructure Index [18].

The UNDESA survey also provides an e-Participation Index which measures the potential of a state to provide transparent government through citizen participation in public policymaking [18]. The index is a composite of three indices: (i) E-Information Index which assesses the information content on government websites on elected officers, programs and policies etc., (ii) E-Consultation that measures the availability of tools for discussion on government websites and availability of websites for elected officers to communicate with their consistencies, and (iii) E-Decision Making which measures the degree to which governments take into account the e-inputs of citizens in their decision processes.

Global average and regional averages are computed for both the e-readiness and e-participation indices based on the indices of the countries in the region. These indices range from 0 as minimum to 1 as maximum.

3.1. Competitiveness of the Asian Region

The regional e-readiness indices for Asia in 2004, 2005 and 2007 are 0.3905, 0.4179 and 0.4467 respectively. For the same period, the e-participation indices for the region are 0.1141, 0.1388 and 0.2084. Figure 1 shows the relative performance of Asia with respect to the other regions.

Figure 1: Regional e-Readiness and e-Participation Indices
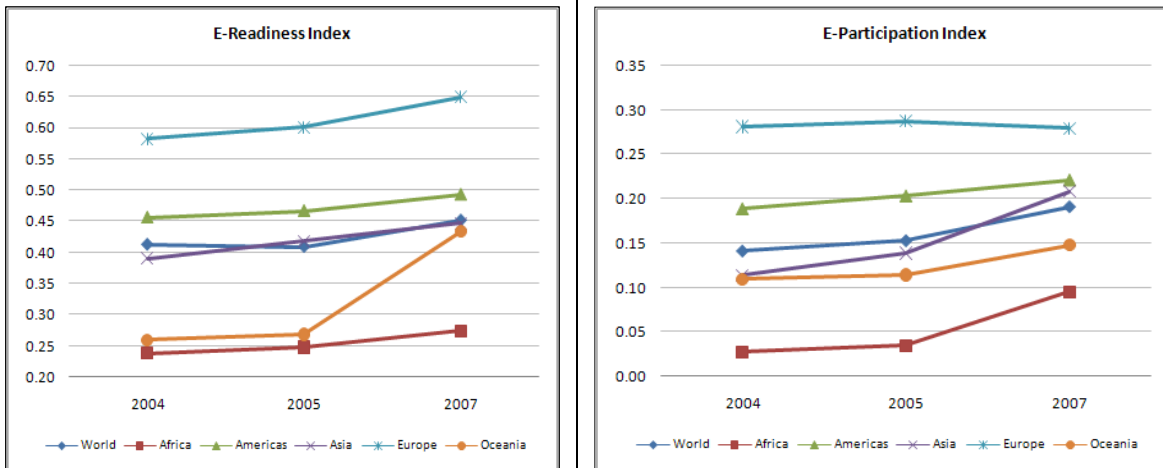
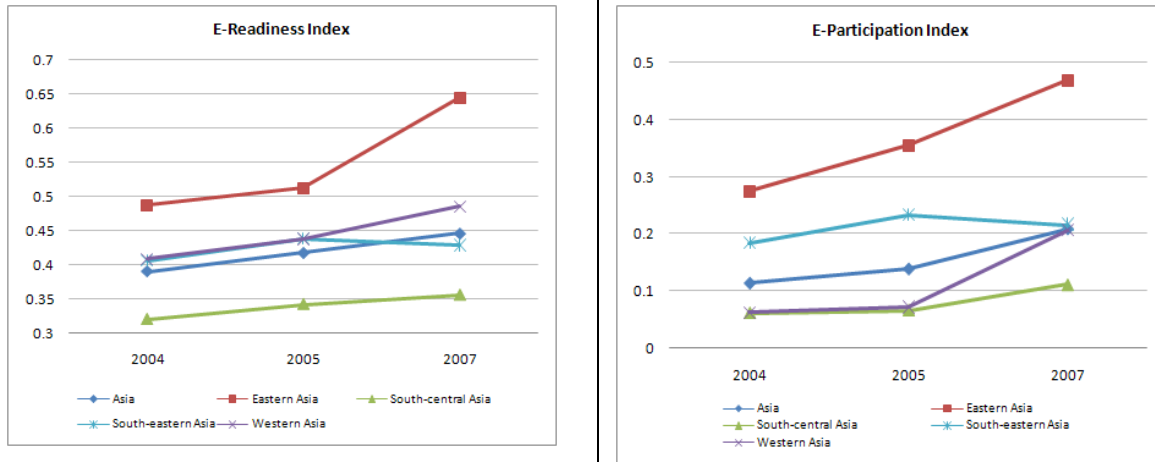*Data Source: UNDESA Global e-Governance Readiness Knowledge Base [17]*

In terms of e-readiness, Asia falls near the global averages for the three consecutive surveys – lagging Europe and the Americas but ahead of Oceania (marginally in 2007) and Africa. In terms of e-participation, Asia also lags Europe and the Americas (marginally) but is leading Africa and Oceania. We note from the e-participation graph in Figure 1 the generally low values for all regions – maximum value under 0.30 for Europe. However, the Asian region has significantly improved its e-participation profile in 2007.

3.2. Sub-Regional Perspective

A closer look at the performance of sub-regions reveals the strong dominance of Eastern Asia (consisting China, DPR Korea, Japan, Mongolia and Republic of Korea) over the other three sub-regions including South-Central Asia, South-Eastern Asia and Western Asia, with an average e-readiness index (2007 survey) of 0.650 and e-participation index of 0.4682. The lagging sub-region is South-Central Asia consisting of: Afghanistan, Bangladesh, Bhutan, India, Iran, Kazakhstan, Kyrgyzstan, Maldives, Nepal, Pakistan, Sri Lanka, Tajikistan, Turkmenistan and Uzbekistan, with an average e-readiness index of 0.3569 and e-participation index of 0.1120 in the 2007 survey. Figure 2 provides the details of sub-regional benchmarks. Western Asia follows East Asia in terms of e-readiness but ties with South Eastern Asia in terms of e-participation.

Figure 2 also shows the steady improvement in the performance the Eastern Asia, Western Asia and South Central Asia from 2004 to 2007 in terms of both the e-readiness and e-participation indices. However for both measures, South Eastern Asia dropped in 2007 close to the Asian regional average.

Figure 2: Sub-Regional e-Readiness and e-Participation Indices for Asia

Data Source: UNDESA Global e-Governance Readiness Knowledge Base [17]

3.3. Intra-regional Divide

Apart from discussing the relative performance of the region and its sub-regions (with the region), a major goal of the paper is to highlight any existing pattern of divide among sub-regions as well as among countries regardless to which sub-region they belong.

3.3.1. Evolution of Divide among Sub-regions

Figure 3 depicts the e-readiness and e-participation divide among sub-regions with East Asia sub-region as the reference sub-region for the three survey years. Gaps are measures of divides or inequalities. Here gaps are computed as the ratio of the index of the disadvantaged sub-region to the index of the reference (or the best) sub-region for a specific survey year. Results show the growing divide in terms of e-readiness between Eastern Asia and three other sub-regions. With the exception of South Eastern Asia, the other sub-regions are closing the divide with respect to Eastern Asia in terms e-participation.

Figure 3: Evolution of e-Readiness and e-Participation Divide among Sub-regions
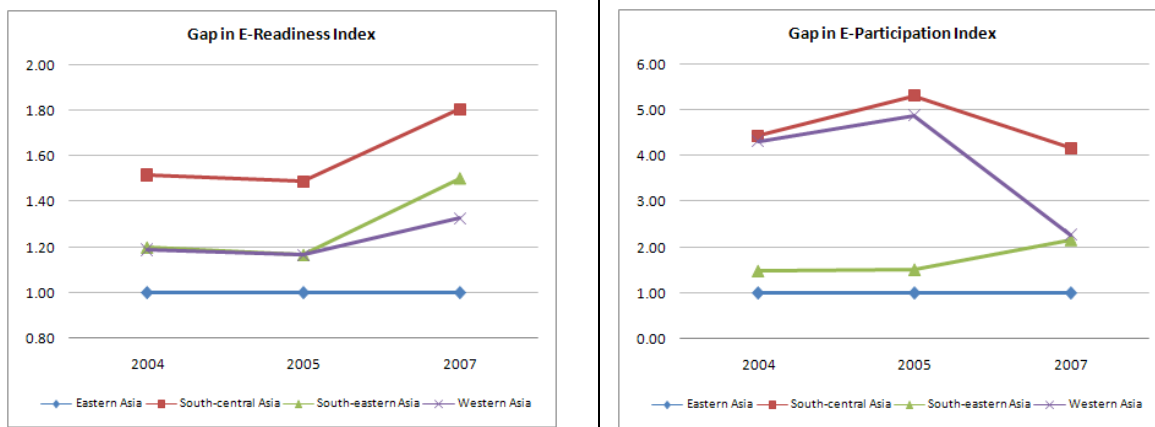
Data Source: UNDESA Global e-Governance Readiness Knowledge Base [17]

3.3.2. Divide among Asian Countries

A deeper insight into the existing divide within the Asia region can be obtained by analyzing the divide directly among the 47 countries in the region. Given the e-readiness indicators and the e-participation index for three survey years, profiles for countries are captured and analyzed using any clustering technique, such as Self Organizing Maps [16], to produce partitions known as Country Clusters. These clusters represent groups of countries with similar e-governance profiles and also provide some form of hierarchy for the countries in terms of e-governance development.

Figure 4: Clusters-based View of Divide among Countries
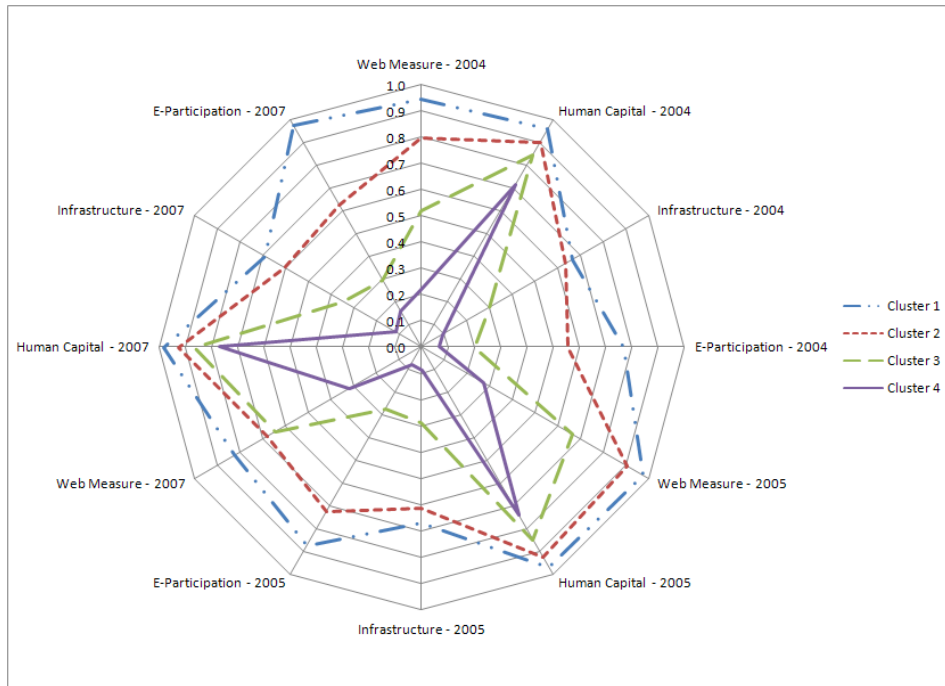

Figure 4 presents the details (average values of the indicators) for each of the four clusters produced. The figure shows that Cluster 1 is superior to the other clusters (Clusters 2, 3 and 4) on all axis of the radar plot. In addition, the concentric patterns of the clusters show an explicit order for the clusters, where Cluster 2 is superior to Cluster 3 and Cluster 3 is superior to Cluster 4. Memberships of the clusters are as follows: Cluster 1 consists of the Republic of Korea. Cluster 2 contains Japan and Singapore, while Israel, Malaysia, Philippines and United Arab Emirates are in Cluster 3. The remaining 40 countries are in cluster 4. This view, in addition to showing the e-governance divide, provides possible progression paths for the countries in the region, e.g. moving from Cluster 3 to Cluster 2 or from Cluster 2 to Cluster 1.

The difference between the values for Clusters on each vertex indicates some measure of divide. A more formal measurement of country divide can be provided by computing an inequality statistics (such as the GINI coefficient) for the e-readiness and e-participation data. Table 1 presents the details of the GINI coefficient computed for both the readiness and e-participation indicators from 2004, 2005 and 2007.

Table 1: GINI Coefficients for e-Readiness and e-Participation Indices for Asian Countries

GINI Coefficient	2004	2005	2007
e-Readiness	0.27	0.26	0.24
e-Participation	0.69	0.69	0.56

Figure 5 shows the Lorenz curves to visually depict the inequality among countries and the evolution of the divide during 2004 – 2007. The graphs show some level of e-readiness divide among countries but narrowing with time (see also Table 1). However, the e-participation graph shows a large divide among countries. The e-participation divide is only beginning to shrink in 2007/2008.

Figure 5: Evolution of e-Governance Divide among Asian Countries as Lorenz Curves
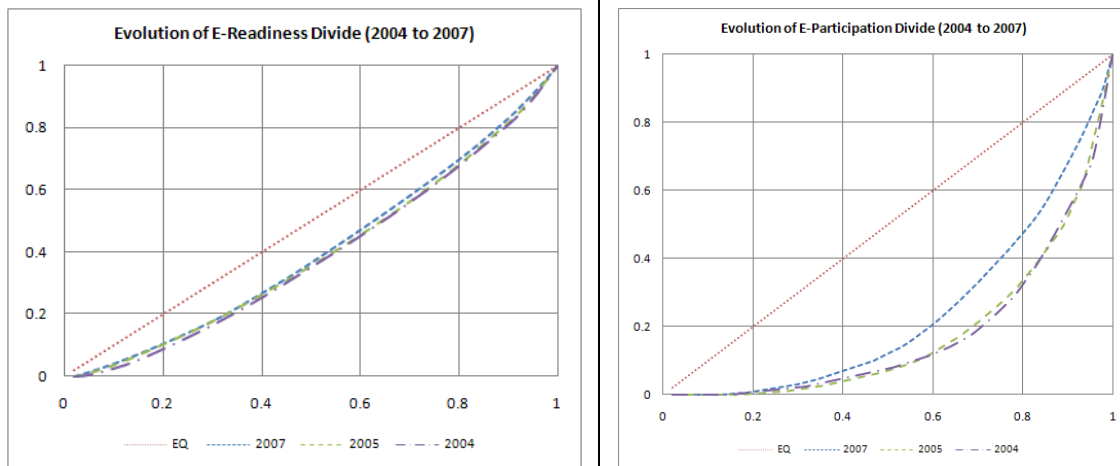
3.3. Summary of Findings

We summarize in this section the results of our analysis on the state of e-governance in Asia:

1) Asia has consistently lagged Europe and Americas but led Oceania and Africa in terms of e-readiness and e-participation since 2004 to date. In terms of e-readiness, the weak areas for the region include infrastructure and online presence, while the availability of Human Capital is a major strength for the region.
2) Albeit the global index for e-participation is low (about 0.15 in 2007), the Asian region made a significant leap between 2005 (index of 0.1388) and 2007 (index of 0.2084).
3) There is a strong dominance of Eastern Asia among sub-regions in terms of e-readiness and e-participation, while South-Central Asia consistently lags in the region.
4) There is a growing divide among sub-regions in terms of e-readiness. Specifically, the gap between Eastern Asia and other sub-regions increased between 2005 and 2007. However, the divide in terms of e-participation is narrowing between Eastern Asia and other sub-regions, with the exception of South East Asia.
5) The 47 countries considered in the region can be partitioned into 4 clusters based on their e-readiness and e-participation profile from 2004 to 2007. The first three clusters together consist of 7 leading countries in Asia in terms of e-governance – Republic of Korea (Cluster 1); Japan and Singapore (Cluster 2); Israel, Malaysia, Philippines and United Arab Emirates (Cluster 3). The last cluster (Cluster 4) contains the remaining 40 countries. These clusters also signify the strata of divides among the Asian countries in terms of e-governance.

6) In a formal sense, there is significant divide among Asian nations in terms of e-readiness for e-government, but the divide is large in terms of e-participation. However, both of these divides are narrowing with time, particular as at 2007/2008.

We explore the possible relationship between e-governance development and the quality of governance in Asia in the next section.

4. Impact of E-Governance on Governance in Asia

This section attempts to evaluate possible impact of e-governance development in Asia on the quality of governance. To achieve this, we investigate if there are any significant relationships between the e-readiness and e-participation indicators and the corresponding governance indicators for the countries in the region. The e-governance data presented in Section 3 [17] is used for the analysis while the World Governance Indicator data [21] is used as basis for governance indicators.

Governance indicators capture [4]: (i) the process by which governments are selected, monitored and replaced; (ii) the capacity of the government to formulate and implement sound policies and (iii) the respect of citizens and the state for the institutions that govern economic and social interactions among them. Out of the 6 governance indicators clusters available, two indicator clusters were selected for the analysis: (i) Voice and Accountability and (ii) Government Effectiveness. Voice and Accountability indicators measure various aspects of the political process, civil liberties and political rights as well as the extent to which citizens of a country are able to participate in the selection of government. Government Effectiveness indicators measure the quality of public service provision, the quality of the bureaucracy, competence of civil servants and credibility of government's commitment to policies. Detailed information on these two indicator clusters are provided in [4].

A starting point for analyzing cause and effect (or impact) relationship between the e-governance and governance is to check for correlation between the two sets of indicators. Therefore, we determine the correlation between the following pairs of e-governance and governance indicators:

o   e-Readiness index and the consolidated Government Effectiveness indicator and
o   e-Participation index and consolidated Voice and Accountability indicator

Data for three years were considered in the analysis – 2004, 2005 and 2007. Table 2 presents the correlation coefficients for the indicator pairs.

Table 2: Consistency between e-Governance and Governance Indicators for Asian Countries

Correlation	2004	2005	2007
e-Readiness versus Government Effectiveness	0.7417	0.8190	0.8599
e-Participation versus Voice and Accountability	0.0062	-0.0155	0.0810

From Table 2, above, we make the following observations:

o   There is a strong positive correlation between e-Readiness index and the Government Effectiveness indicators for countries in the region. In fact, the strength of this relationship increased with time (from 2004 to 2007)
o   There appears to be no relationship between the e-Participation index and the Voice and Accountability indicators of the countries in the Asian region. However, in 2008 there seem to be a small positive (0.1) correlation between the two variables.

While simple correlation analysis does not establish causality between variables, it provides a good basis for further investigation into the relationship. Details of the governance indicators provided in [4] show that the

Government Effectiveness indicator cluster captures information related to the issues such as: the use of telecommunication for business, quality of public administration, management of development programs, administrative and technical skills, efficiency of the national bureaucracy, national policy formulation and implementation, coordination between central- and local-level governments, institutional effectiveness, wasteful government expenditures etc.

Since the governance indicators are computed from perception-based surveys, obvious developments in e-governance is likely to provide positive responses to the issues listed above. Similarly, the relatively poor level of e-participation in Asia could be responsible for the neutral relationship between e-participation and the Voice and Accountability indicator.

5. Bridging Intra-regional Divide

Following the current landscape of e-governance in the Asian region, we highlight here major issues to be addressed by regional entities and countries in Asia for meaningful progress. We also discuss in this section strategies related to identified issues based on core e-governance strategies of leading nations in the region (members of Clusters 1, 2 and 3) and best practices. In addition, to increase intra-regional knowledge sharing and collective actions in the implementation of strategies, we propose the cultivation of Communities of Interests made up of countries with similar profiles to complement the actions by regional and sub-regional organizations.

5.1. Major Issues

From the results presented in Sections 3 and 4, we identify the basic challenges for the region:

1) Building the required infrastructure for e-governance, taking into consideration possible innovation in the use of existing telecommunication and network infrastructures, other opportunities provided by New Generation Networks such as mobile broadband and major resource constraints in many countries of the region.
2) Enabling lagging sub-regions to accelerate development, bride existing divide and improve regional competiveness which presently relies on a few countries in the region.
3) Building more ICT-based participatory processes and improved democratic structures across Asia, possibly in traditionally non-democratic environments and cultures.
4) Supporting individual countries (Cluster 4 members) to advance their e-governance programs, and in particular ensure alignment of e-governance programs with core and urgent socio-economic (e.g. disaster management) and political development issues, particularly for sub-regions such as South-Central Asia.
5) Ensuring that e-governance initiatives deliver the expected governance outcomes and impact, for instance, by transparently linking investment in e-government to outcomes such as government effectiveness, rule of law, regulatory quality, control of corruption and accountability.

5.2. Strategies and Policies

In the context of the issues highlighted in Section 5.1, we identify examples of e-governance strategies employed by the leading countries and economies in Asia – Korea [14], Japan [10][11], Singapore [8] and Hong Kong [6][7]. E-Governance strategies are usually specified as part of an overall ICT or Knowledge Society Strategy. We rely on the knowledge base described in [2] to extract and consolidate e-governance strategies, IT infrastructure strategies and digital divide strategies spanning the four economies, which include:

o Strengthening linkage between informatization and public administration reform
o Better integrating the structures of government
o Encouraging greater electronic participation in policy process through various channels (e.g. Web 2.0)

- Developing mobile government infrastructure
- Extensive use of public consultation and feedback, particularly in policy matters
- Building strategic partnership with the private sector and the civil society
- Providing electronic services for the private sector
- Driving the utilization of electronic public services by citizens
- Developing a barrier free information policy
- Building a digital inclusion program covering SMEs
- Next generation public services which are highly personalized, pervasive and preferably ubiquitous
- Investing in high speed Next Generation Networks
- Providing safety measures for the cyberspace

A number of good practices for e-government are discussed in greater details in [18].

To simplify the implementation of these strategies, regional development-oriented organizations (such as the United Nations Economic Commission for Asia and the Pacific) can develop a suitable e-government framework for region-wide implementation.

5.3. Complementing Regional Actions - Communities

In addition to a top-down regional approach, country-level implementation can greatly benefit from knowledge sharing and collaborative actions enabled by communities of interests (CoI). Specialized Communities are increasingly becoming popular as an effective approach to addressing general or shared problems. Arguably, strategies, challenges and opportunities in developing e-governance are similar at higher levels of concerns.

To provide ideas on evolutions of e-governance communities in the Asian region, we carried out a cluster analysis (using Self Organizing Maps [13]) of the e-readiness and e-participation profiles of the 47 countries in Asia for 2004, 2005 and 2007. The experiment revealed a number of plausible groupings of countries based on similarities. One of resulting groupings is given in Table 3, where the 47 countries are organized into 9 communities. The spatial ordering of the groups shown on the topographic map reveals the proximity of the computed communities.

Table 3: Example Community Configuration Based on Similarity of E-Governance Profiles

Community	Country Members	Spatial Ordering of Groups
Community 1	Kuwait , Pakistan, Qatar	
Community 2	Bahrain, Cyprus, Israel, Japan, Malaysia, Philippines, Republic of Korea, Singapore, Thailand, Turkey, United Arab Emirates	
Community 3	China, Jordan, Lebanon	
Community 4	Brunei Darussalam, Mongolia, Saudi Arabia	
Community 5	Kazakhstan, Maldives, Viet Nam	
Community 6	India, Kyrgyzstan, Sri Lanka	
Community 7	Afghanistan, Armenia, Bangladesh, Cambodia, Democratic People's Republic of Korea, Indonesia, Iraq, Lao People's Democratic Republic, Myanmar, Oman, Syrian Arab Republic, Tajikistan, Timor-Leste, Turkmenistan, and Yemen	
Community 8	Azerbaijan , Georgia	
Community 9	Bhutan, Iran, Nepal, Uzbekistan	

The spatial ordering provides the basis for the refinement of the groups into a fewer number, for instance by combining Groups 1 and 2, or combining Groups 3, 4, 5 and 6. The cohesion of the resulting community can be evaluated by measures of variability (e.g. variances of each variable describing the profile of the countries).

Once communities are established through clustering or some other form of classification scheme, common problems can be expounded and solutions shared and perhaps jointly developed for economy of scale.

6. Conclusions

The goal of this paper is to present the state of e-governance in the Asian region in various perspectives – global competitiveness, intra-regional divide and impact of current e-governance efforts on the quality of governance across the region. Based on the findings, we identify critical issues to be addressed at both regional and country levels. The paper also highlights core strategies of leading countries in the region as example of good practices. Finally, the paper suggests a community-oriented framework for supporting regional interventions by international organizations or regional entities.

While it can be concluded that Asia is yet to attain a comfortable level of e-governance development based on the current global standing of the region and existing internal divides, the strong positive relationship between e-readiness and government effectiveness motivates further investigation into causality relationship between these two variables. Similarly, the apparent independence of e-participation and accountability efforts definitely deserves attention by policy makers in the region.

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