

How E-Ready is E-Sri Lanka?

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ABSTRACTS

First, this paper assesses e-readiness of Sri Lanka using a measuring tool that utilizes 52 socio-economic indicators. Second, based on the assessment, this paper suggests methods for improving e-readiness of Sri Lanka. The uniqueness of this paper lies in the quantitative analysis of the e-readiness of Sri Lanka, whereas many other works engage in qualitative exposure.

Keywords: E-government, e-Sri Lanka, e-readiness

1. INTRODUCTION

In November 2002, the government of Sri Lanka launched *e-Sri Lanka* – the information and communication technology development roadmap to achieve e-governance by the year 2007. Sri Lanka's first ever e-government conference was held in May 2003. The event was given utmost importance by the government of Sri Lanka, and was supported by some of the inter-governmental organizations such as the United States Agency for International Development (USAID) and the Swedish International Development Agency [19].

According to the official document, the main purpose of e-Sri Lanka is to achieve the desired levels of development, by enhancing national competitiveness, reduce or eradicate poverty by realizing enhancements in the quality of life of its citizens [10]. The government of Sri Lanka believes that the vision will

take the dividends of information and communication technology (ICT) to every village, to every citizen, to every business and also transform the way Government works [19].

The main purpose of this paper is to assess e-readiness of Sri Lanka. The uniqueness of this paper lies in the quantitative analysis of the e-readiness of Sri Lanka, whereas many other works engage in qualitative exposure. Based on the assessment, this paper also suggests methods for improving e-readiness of Sri Lanka.

In the next section (section 2), a tool for measuring e-readiness is presented. E-readiness of Sri Lanka is measured in section 3. In section 4, a set of proposals is presented to improve e-readiness and hence e-governance and e-commerce activities in Sri Lanka.

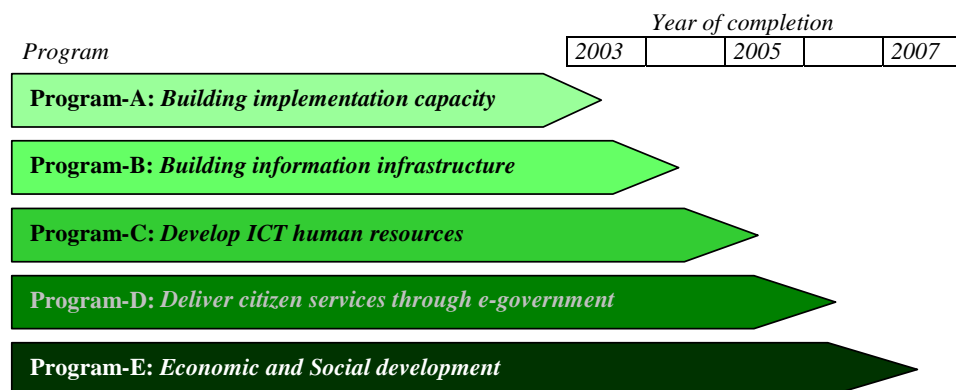


Figure-1: Five-program implementation strategy to achieve the vision of e-Sri Lanka (based on [GoSL, 2003])

2. A TOOL FOR MEASURING E-READINESS

There are many tools available to measure e-readiness of a country. In this work, a tool developed by Bui et al

[2] is used. This tool is selected because it is easily extensible, easy to use and has a large set of indicators.

2.1 The tool

The tool developed by Bui et al [2] consists of three basic building blocks. The three basic building blocks are (figure-1):

- I. Demand forces
- II. Supply forces, and
- III. Societal Infrastructure

The three basic building blocks are divided into eight major factors, and each of these major factors has a set of indicators. The major factors and the number of indicators that come under these factors are given below:

I: Demand forces:

- i. Culture, understanding and effectiveness: 4 indicators

- ii. Knowledgeable citizens: 6 indicators

II: Supply forces:

- i. Industry competitiveness: 7 indicators

- ii. Access to skilled workforce: 6 indicators

- iii. Willingness and ability to invest: 4 indicators

III: Societal Infrastructure:

- i. Cost of living and pricing: 3 indicators

- ii. Access to advanced infrastructure: 10 indicators

- iii. Macro economic environment: 12 indicators

The tool uses a total of 52 indicators.

2.2 Measuring e-readiness

All 52 indicators (e_i) are assigned values on a 1-5 scale; 1 is the worst score and 5 is the best score. Then e-readiness of a country is calculated by a simple Figure-of-Merit (FOM) calculation. In this calculation, all the indicator values are multiplied with corresponding weights and summed together.

$$\text{E-readiness} = \frac{\sum_{i=1}^{52} IWeight_i \times e_i}{\sum_{i=1}^{52} IWeight_i} \quad [2]$$

3. MEASURING E-READINESS OF SRI LANKA

In this section, all 52 indicators are evaluated on a 1-5 scale (1 - worst score, 5 – best score).

3.1 Measuring the demand forces

There are two major factors under this block.

3.1.1 Major factor-1: Culture, understanding and effectiveness

Indicator-1. English Language usage: English is commonly used in government and is spoken competently by about 10% of the population [32]. Score: $e_1 = 1.4$

Indicator-2. Percentage of urban population: Urban population in Sri Lanka was 22% in 1998; it was 77% in USA [27]. Score: $e_2 = 2.1$

Indicator-3. Percentage of population over 65 years or older: The percentage for Sri Lanka in 2000 was 6% [20]. Score: $e_3 = 4.9$

Indicator-4. National culture open to foreign influence: N/A

3.1.2 Major factor-2: Knowledgeable citizens

Indicator-5: Adult literacy rate: Sri Lanka has a 91.4% literacy rate [12]. Score: $e_5 = 4.8$

Indicator-6: Secondary enrollment: Sri Lanka has 71% gross secondary enrollment rate in 1998; Norway is one of the leaders under this topic with 117% [28]. Score: $e_6 = 3.4$

Indicator-7: Tertiary enrollment: Tertiary enrollment rate for Sri Lanka is 5%; the rate for Canada is 90% [28]. Score: $e_7 = 1.2$

Indicator-8: MGMT education available in first-class Business Schools: [9] gave 3.7 points to Sri Lanka on a 1-7 scale. Score: $e_8 = 2.8$

Indicator-9: 8th grade achievement in Science: No data available for this indicator. However, going by the diverse material (e.g. [11]) stating that Sri Lanka students perform just about the international average in mathematics, a value of 2.5 is justifiable. Score: $e_{10} = 2.5$

Indicator-10: Flexibility of people to adapt to new challenges: N/A

3.2 Measuring the supply forces

There are three major factors under this block.

3.2.1 Major factor-3: Industry competitiveness

Indicator-11: Technology achievement index: TAI value for Sri Lanka was 0.2 whereas Finland got the highest rating 0.744 [22]. Score: $e_{11} = 2.0$

Indicator-12: Gross tertiary Science & Engineering enrollment ratio: Sri Lanka had 5%. Canada had the highest value for this indicator, 85% [13]. Score: $e_{12} = 1.2$

Indicator-13: Administrative burden for start-ups: On a 1-7 scale, Sri Lanka received 4.9 points [9]. Score: $e_{13} = 3.6$

Indicator-14: Private sector spending on R&D: On a 1-7 scale, [9] awarded 3.10 points to Sri Lanka. Score: $e_{14} = 2.4$

Indicator-15: High-Tech exports as percentage of manufactured exports: Sri Lanka high-tech export is 3% of its total exports. For Singapore, it is 61% [30]. Score: $e_{15} = 1.2$

Indicator-16: Patent applications granted by USPTO: N/A

Indicator-17: Total expenditure for R&D as percentage of GNI: N/A

3.2.2 Major factor-4: Access to skilled workforce

Indicator-18: Public spending on education as percentage of GDP: Citing again [30], Sri Lanka allocated 2.6%; Norway has the highest spending (6.8%) on education as a percentage of GDP. Score: $e_{18} = 2.5$

Indicator-19: Extend of staff training: On a 1-10 scale, [29] gave 2.2 points to Sri Lanka. Score: $e_{19} = 3$

Indicator-20: Research collaboration between companies and universities: On a 1-10 scale, [29] gave 3.0 points to Sri Lanka. Score: $e_{20} = 1.9$

Indicator-21: Number of technical papers per million people: Sweden has the highest papers per million (6.82). For Sri Lanka, it was 1.44 [13]. Score: $e_{21} = 1.8$

Indicator-22: University education meets the needs of economy: Though no valid data is available, according to [11], general literacy for ICT development and growth is insufficient. Score: $e_{22} = 2.0$

Indicator-23: Well-educated people do not emigrate abroad: N/A

3.2.3 Major factor-5: Willingness and ability to invest

Indicator-24: Composite ICRG risk rating: [23] gave 64% (low risk) to Sri Lanka. Score: $e_{24} = 3.6$

Indicator-25: Availability of venture capital: Sri Lanka received 3.1 points on a 1-7 scale [9]. Score: $e_{25} = 2.4$

Indicator-26: Entrepreneurship among managers: [29] awards 5.19 points to Sri Lanka on a 1-10 scale. Score: $e_{26} = 2.8$

Indicator-27: Foreign Direct Investment as percentage of GDP: FDI in Sri Lanka was 1.22%; Singapore has the highest FDI, which is 9.34% of its GDP [20]. Score: $e_{27} = 1.5$

3.3 Measuring the societal infrastructure

There are three major factors under this block.

3.3.1 Major factor-6: Cost of living and pricing

Indicator-28: International cost of living based on US\$ 100: Osaka, Japan is the most expensive place to live (COL index 126.1) and Asuncion, Paraguay is the least expensive place (COL index 36.5). Colombo, Sri Lanka is rated with an index 60 [17]. Score: $e_{28} = 4.0$

Indicator-29: Inflation rate – CPI in percentage: Currently Sri Lanka endures a rate of 8%. Among the best performing countries are USA and Norway both with 1% [3, 20]. Score: $e_{29} = 4.7$

Indicator-30: GDP per capita (PPP) in US\$: PPP for Sri Lanka is US\$ 3279. Norway has one of the highest GDP per capita, currently US\$ 36,000 [30]. Score: $e_{30} = 1.4$

3.3.2 Major factor-7: Access to advanced infrastructure

Indicator-31: Telephone per 1000 people: On a 1-10 scale, Sri Lanka received 4.17 points [30]. Score: $e_{31} = 2.6$

Indicator-32: Mobile phones per 1000 people: On a 1-10 scale, Sri Lanka received 3.17 points [30]. Score: $e_{32} = 2.0$

Indicator-33: Computers per 1000 people: On a 1-10 scale, Sri Lanka received 1.72 points [30]. Score: $e_{33} = 1.3$

Indicator-34: Internet hosts per 10000 people: On a 1-10 scale, Sri Lanka received 0.65 points [30]. Score: $e_{34} = 1.0$

Indicator-35: International telecom, cost of call to US: It cost US\$ 0.30 to make a 5 min call from Norway to USA. From Sri Lanka, the cost is 7.50 [18]. Score: $e_{35} = 1.0$

Indicator-36: E-government: According to [1], USA leads with a score of 3.11 points whereas Sri Lanka got 0.92 points. Score: $e_{36} = 2.2$

Indicator-37: Computer processing power as a % of worldwide MIPS: Sri Lanka's computer processing power is negligible. Score: $e_{37} = 1$

Indicator-38: Freedom on the Internet: [8] gives 52 points out of 100 points. Score: $e_{38} = 2.5$

Indicator-39: Investment in Telecom as a percentage of GDP: N/A

Indicator-40: ICT expenditure as a percentage of GDP: N/A

3.3.3 Major factor-8: Macro economic environment

Indicator-41: Trade as a percentage of GDP: Trade as percentage of GDP should be as low as possible; rate for Sri Lanka is 78 [30]. Score: $e_{41} = 1.8$

Indicator-42: Protection of property rights: On a 1-7 scale, Sri Lanka scored 4.2 points [9]. Score: $e_{42} = 3.1$

Indicator-43: Tariff and non-tariff barriers: On a 1-10 scale, Sri Lanka scored 6 points. Hong Kong and Singapore scored 10 points [29]. Score: $e_{43} = 3.4$

Indicator-44: Soundness of banks: On a 1-7 scale, Sri Lanka received 5.3 points [9]. Score: $e_{44} = 3.9$

Indicator-45: Local competition: On a 1-7 scale, Sri Lanka received 5.10 points [9]. Score: $e_{45} = 3.7$

Indicator-46: Regulatory framework: Singapore is on the top of the list with 1.82 points; Sri Lanka scored 0.38 points in-line with Peru (0.36). Ethiopia was one of the worst performers with -0.71 points [13]. Score: $e_{46} = 2.5$

Indicator-47: Government effectiveness: Singapore is on the top of the list with 2.16 points; Sri Lanka scored -0.44 points among the worst performers like Kazakhstan (-0.61), Maruritania (-0.66) [13]. Score: $e_{47} = 1.3$

Indicator-48: Political stability: Finland is most politically stable (1.61 points). Sri Lanka was awarded -1.63 points, one of the worst performers [13]. Score: $e_{48} = 1.0$

Indicator-49: Press freedom: A press survey [8], places Sri Lanka in the middle of the list. Sri Lanka received 52 points on a 0 (best score) – 100 (worst score) scale. Best performers were Sweden, New Zealand and Iceland, all of these received 8 points; worst performers were Iraq and North Korea, which received 95 and 96 points respectively. Score: $e_{49} = 3.8$

Indicator-50: Rule of law: Singapore is again on the top of the list with 1.85 points; Sri Lanka scored -0.31 points, whereas Nigeria scored -1.13 [13]. Score: $e_{50} = 2.3$

Indicator-51: Control of corruption: Finland is the best performer with 2.25 points; Sri Lanka scored 0.00 points, whereas Nigeria (one of the worst performers) scored -1.05 [13]. Score: $e_{51} = 2.3$

Indicator-52: Adequacy of regulations and supervision of financial institutions: N/A

3.4 The results: the total e-readiness

Assuming equal weights of 1 to all the indicators, we summarize the e-readiness value for each major factor.

Major factor-1: Culture, understanding and effectiveness: $e_{mf_1} = 2.8$

Major factor-2: Knowledgeable citizens: $e_{mf_2} = 2.9$

Major factor-3: Industry competitiveness: $e_{mf_3} = 2.1$

Major factor-4: Access to skilled workforce: $e_{mf_4} = 2.2$

Major factor-5: Willingness and ability to invest: $e_{mf_5} = 2.6$

Major factor-6: Cost of living and pricing: $e_{mf_6} = 3.4$

Major factor-7: Access to advanced infrastructure: $e_{mf_7} = 1.7$

Major factor-8: Macro economic environment: $e_{mf_8} = 2.6$

E-readiness values for each building block is given below:

Basic building block-1: Demand forces:

$$e_{DF} = \frac{e_{mf_1} + e_{mf_2}}{2} = 2.9$$

Basic building block-2: Supply forces:

$$e_{SF} = \frac{e_{mf_3} + e_{mf_4} + e_{mf_5}}{3} = 2.3$$

Basic building block-3: Societal Infrastructure: $e_{IN} =$

$$\frac{e_{mf_6} + e_{mf_7} + e_{mf_8}}{3} = 2.5$$

Summing all these values together:

$$\text{E-Readiness} = \frac{e_{DF} + e_{SF} + e_{IN}}{3} = 2.5$$

4. ANALYSIS

By simply going through indicators, it is easy to find out where Sri Lanka should concentrate to improve its e-readiness.

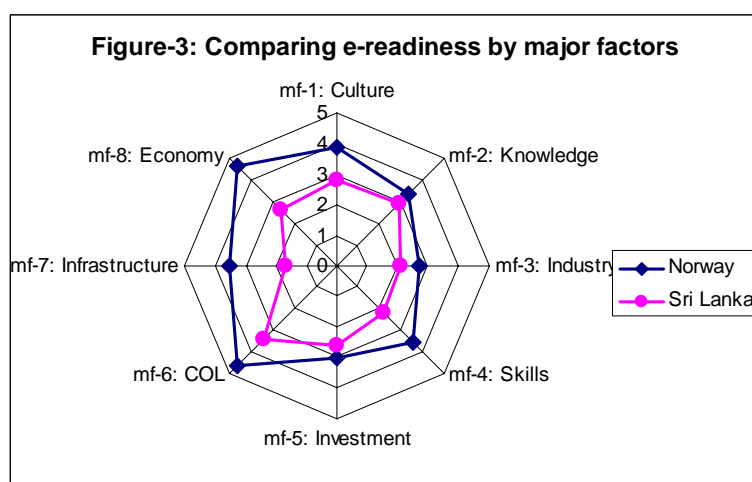
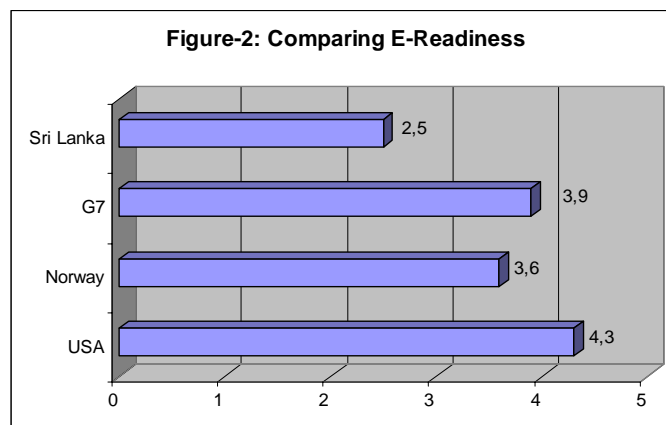
E-readiness values for all the major factors are below average (the average value is 3.0). And hence, the building blocks and the total e-readiness values are all below the average value. Figure-2 plots e-readiness of Sri Lanka against e-readiness of other well-known economies like G7, USA, and Norway; data for Norway is taken from Davidrajuh (2004); data for G7 and USA is taken from Bui et al (2001).

Figure-3 depicts detailed benchmarking of e-readiness of Sri Lanka based on the eight major factors. For comparison, values for Norway are also shown in the figure.

In Sri Lanka, demand forces (capability of the people) are about the average value. However, supply forces and societal infrastructure are poor. In some of the

areas (English language usage, tertiary enrollment, high-tech exports, GDP per capita, computers per 1000 people, and telecom costs) Sri Lanka performs poorly. Some other indicators (political stability = 1.0, and government effectiveness = 1.0) show that there is a serious problem in running the country.

Investment in ICT sector is low. After many technology investment debacles, private investors are not so enthusiastic about telecom ventures. The government has also problems in investing in technology sector mainly due to ever increasing health care costs.



REFERENCE

- [1]. ASPA (2001) Benchmarking E-Government: A Global Perspective: <http://unpan1.un.org/intradoc/groups/public/documents/un/unpan003984.pdf>
- [2]. Bui, T., Sebastian, I., Jones, W., and Naklada, S. (2002) E-Commerce Readiness in East Asian APEC Economies, The Pacific Research Institute for Information Systems Management (PRIISM), Honolulu, Hawaii, USA
- [3]. CIAs World Fact book: <http://www.cia.gov/cia/publications/factbook/index.html>
- [4]. Expert (2003): <http://www.expatforum.com/Resources/icol.htm>
- [5]. Reggie Davidrajuh (2004) "Measuring and Improving E-Readiness of Norway", Proceedings of the 2004 International Business Information Management Conference (IBIM'04), Amman - Jordan, July, 2004
- [6]. eEurope (2003) http://europa.eu.int/information_society/eeurope/index_en.htm
- [7]. Flanagan, T. (2004) Designing a Course on E-Government, Bask Thesis (in Norwegian), Stavanger University College, Norway.
- [8]. Freedom of the Press (2003): <http://www.freedomhouse.org/pfs2003/pfs2003.pdf>
- [9]. Global Competitiveness Report (2001): <http://www.weforum.org/site/homepublic.nsf/Content/Global+Competitiveness+Programme>
- [10]. GoSL (2003) Policy on E-Government, Government of Sri Lanka, May 2003
- [11]. Greenberg ICT Survey (2002) "Country ICT survey for Sri Lanka", Greenberg ICT Survey, Quebec, Canada

- [12]. Human Development Report (2001): www.ssb.no/emner/04/01/notat200306/notat200306.pdf
- [13]. Knowledge Assessment Matrix (2002): http://www1.worldbank.org/gdln-scripts/programs/kam2002/kamscrip.exe/show_page
- [14]. Korea, Ministry of Information and Communication (2003) "Changing Korea with e-Government", <http://www.egov.go.kr>
- [15]. Liu, S. and Hwang, J. (2003) Challenges to transforming IT in the US government, IT Professional, May-June, 2003.
- [16]. McConnell International (2001) "Ready? Net. Go! Partnership Leading the Global Economy", www.McConnellInternational.com
- [17]. Mercer Human Resource Consulting (2003): <http://www.finfofacts.ie/costofliving.htm>.
- [18]. Opex Communications (2003): <http://www.opexld.com>
- [19]. SundayLeader (2003) <http://www.thesundayleader.lk/20030504/business-more.htm>
- [20]. SIMA (2003): <http://devdata.worldbank.org/query/>
- [21]. Taylor Nelson Sofres (2002) "Government Online: An International Perspective", <http://www.tnsofres.com/gostudy2002/>
- [22]. Technology Achievement Index (2001): www.undp.org/hdr2001/indicator/indic_267_1_1.html
- [23]. The International Country Risk Guide (2000): <http://www.countrydata.com>
- [24]. Turban, E. And King, D. (2003) Introduction to E-commerce, Prentice-Hall, New Jersey
- [25]. VOX (2003): www.vox.no/prosjektbase/SearchForm.aspx?ECode0=104&EVal0=141&pdid=3761
- [26]. Wong (2000) At the Dawn of E-Government; Deloitte Research, New York
- [27]. World Bank (2000): <http://www.worldbank.org/wdr/2000/pdfs/engtable2.pdf>
- [28]. World Bank (2001): <http://www.worldbank.org/data/wdi2001/index.htm>
- [29]. World Competitiveness Yearbook (2001): <http://www.imd.ch>
- [30]. World Development Indicators (2001): <http://www.worldbank.org/data/wdi2001/index.htm>
- [31]. World Development Indicators (2002): http://www1.worldbank.org/gdln-scripts/programs/kam2002/kamscrip.exe/show_page
- [32]. World Factbook (2003): <http://www.bartleby.com/151/>
- [33]. World Information Technology and Services Alliances (2000) "International Survey on E-commerce", <http://www.witsa.org>
- [34]. Zhou, H. (2001) "Global Perspectives on E-Government", the 3rd Caribbean Ministerial Consultation and High-Level Workshop, December 2001, Jamaica