eReadiness: Ready For What?

Sharon Eisner Gillett, Michael Siegel, Michael Best, Vincent Maugis and the Globalization of eBusiness (GeB) Project Team
<sharoneg, msiegel, mikeb, vmaugis, globalebiz@mit.edu>

October 9, 2002
Research Team

- Michael Best (Media Lab)
- Ramon Cavazos (UROP)
- Nazli Choucri (Political Science)
- Sharon Gillett (ITC)
- Farnaz Haghseta (TMP student)
- Stuart Madnick (Sloan)
- Vincent Maugis (Research intern, TDP)
- Shawn O’Donnell (ITC)
- Michael Siegel (Sloan)
- Harry Zhu (TMP student)

With thanks to the Center for eBusiness for their Vision Fund support of this project

<globalebiz@mit.edu>
Outline

- Project goals
- Framework: eReadiness for what?
- Results of pilot application to e-banking
  - Pathways
  - Individual country studies
- Conclusions
eReadiness Goals

- For governments and development organizations
  - Effective targeting of investments in ICT

- For businesses
  - Effective expansion into new markets
  - Typically, focused on particular types of opportunities / applications
Examples of Opportunities

- eBanking
- eGovernment
- eHealth
- eFarming
- eProcurement
- eTail (online retail)
Goals for MIT CeB Research

- Develop tools and methods to factor opportunities into eReadiness
- Explore how opportunity-specific metrics and outcomes relate to eReadiness metrics
- Ultimately, want to answer questions such as...
Where to Start?

What is best investment to improve likelihood of success of particular opportunity?

Examples:
What can we learn from the eBanking leaders?
How best to prepare Dominican Republic for eHealth initiatives?
Where’s My Opportunity?

Which countries show most promise as new markets for particular opportunities?

Example:
Where should we look to develop new markets for eBanking?
What’s Best in Country X?

What is the current state of readiness for specific opportunities in particular country?

Examples:
Should we try to do eBanking in Ghana today?
What is most promising eBusiness opportunity in Ghana today?
Limitations of 1G eReadiness

- Data and methods rarely available publicly
- Implicit assumption of uniformity
  - Same metric has same relevance in every context?
- Metrics alone do not determine action plan
  - Prioritizing remedies requires construction of richer models of ICT & development dynamics
Factoring in Opportunities

◆ Move beyond “one-size-fits-all” requirements to consider needs of different opportunities
  ■ E.g. e-tailing vs. e-banking logistics needs

◆ Concept of multiple pathways
  ■ Same opportunity may be satisfied in different ways
    ♦ eBanking on mobile phone vs. PC (Japan)
    ♦ Delivery of goods to cyber-cafes (Peru) or convenience stores (Japan)
Research Framework

Input metrics:
Data Model

Access
Capacity

Banking
Govt. Services
Health Care
Retail
Procurement
Agriculture

Output metrics:
Service Penetration

eBanking
eGovernment
eHealth
eFarming
eTail
eProcurement

If...then
Data Model

E-Readiness

Access
- Infrastructure
  - telephone density
  - mobile phone penetration

- Services
  - telephone prices
  - ISP competition
  - etc.

Capacity
- Social
  - literacy rate
  - poverty index
  - etc.

- Economic
  - GDP per capita
  - free trade
  - etc.

- Political
  - telecom regulation
  - corruption
  - etc.

Opportunity
- 
  - # credit card accounts
  - # ATMs
  - # bank branches

etc.
This Pilot Project

Test eBanking in 10 countries

<table>
<thead>
<tr>
<th>More Developed</th>
<th>Less Developed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>Brazil</td>
</tr>
<tr>
<td>Singapore</td>
<td>Dominican Republic</td>
</tr>
<tr>
<td>Spain</td>
<td>Ghana</td>
</tr>
<tr>
<td>Sweden</td>
<td>India</td>
</tr>
<tr>
<td>U.S.</td>
<td>Russia</td>
</tr>
</tbody>
</table>
Sample of Data Sources

Access and Capacity

- CIA World Factbook 2001
- International Telecommunication Union: ICT Statistics by Country (Figures for 2001)
- World Bank Development Indicators: At a Glance tables (2000, 2001)
- World Bank Institute: Knowledge Assessment Methodology (2000)

Opportunity (eBanking)

Key Data

Requirements for e-Banking Applications

<table>
<thead>
<tr>
<th>Basis</th>
<th>Sweden</th>
<th>Singapore</th>
<th>United States</th>
<th>Japan</th>
<th>Spain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed telephone lines</td>
<td>74</td>
<td>47</td>
<td>66</td>
<td>60</td>
<td>43</td>
</tr>
<tr>
<td>per 100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cellular telephone lines</td>
<td>79</td>
<td>72</td>
<td>44</td>
<td>59</td>
<td>66</td>
</tr>
<tr>
<td>per 100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total telephone lines</td>
<td>153</td>
<td>120</td>
<td>111</td>
<td>118</td>
<td>108</td>
</tr>
<tr>
<td>per 100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internet hosts</td>
<td>825</td>
<td>479</td>
<td>3,714</td>
<td>559</td>
<td>133</td>
</tr>
<tr>
<td>per 10,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal computers</td>
<td>56</td>
<td>51</td>
<td>63</td>
<td>35</td>
<td>17</td>
</tr>
<tr>
<td>per 100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secure servers</td>
<td>7</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>per capita</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost of local call</td>
<td>0.13</td>
<td>0.02</td>
<td>0.00</td>
<td>0.07</td>
<td>0.09</td>
</tr>
<tr>
<td>US$ for 3 min</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household consumption</td>
<td>13,434</td>
<td>7,591</td>
<td>20,996</td>
<td>18,332</td>
<td>8,625</td>
</tr>
<tr>
<td>US$ per capita</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control of government corruption</td>
<td>2.21</td>
<td>2.13</td>
<td>1.45</td>
<td>1.20</td>
<td>1</td>
</tr>
<tr>
<td>Indice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ATM/cash dispensers</td>
<td>295</td>
<td>447</td>
<td>991</td>
<td>922</td>
<td>1,123</td>
</tr>
<tr>
<td>per million</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cards with a credit function</td>
<td>430</td>
<td>2,342</td>
<td>4,539</td>
<td>1,759</td>
<td>389</td>
</tr>
<tr>
<td>per 1000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

E-Banking Opportunities Outcomes

<table>
<thead>
<tr>
<th>Basis</th>
<th>Sweden</th>
<th>Singapore</th>
<th>United States</th>
<th>Japan</th>
<th>Spain</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-banking users</td>
<td>% of population</td>
<td>23</td>
<td>9</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Checking account balance</td>
<td>% of population</td>
<td>22</td>
<td>9</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Transferring money between accounts</td>
<td>% of population</td>
<td>20</td>
<td>6</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Paying bills</td>
<td>% of population</td>
<td>21</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Share trading</td>
<td>% of population</td>
<td>8</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Purchasing other financial services products</td>
<td>% of population</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
Pathways Method

- Select key indicators from Access, Capacity and Opportunity data
- Scale indicators 1-10 within sample
  - Emphasizes variation of key indicators among selected countries
- Draw pathways models to visualize influence and relations of factors
- Compare outcomes (penetration)
eBanking Pathways

Access
- Infrastructure support
- Network security

Opportunity
- Household consumption
- ATMs
- Credit cards

Capacity
- Confidence in Government

E-banking penetration

Infrastructure support: HIGH, MID, LOW

Network security: Scale 0 to 25%

Household consumption: Japan, Singapore, Spain, Sweden, United States

ATMs: Japan, Singapore, Spain, Sweden, United States

Credit cards: Japan, Singapore, Spain, Sweden, United States

Confidence in Government: Japan, Singapore, Spain, Sweden, United States

October 9, 2002
Globalization of eBusiness Group
Opportunity Metrics Matter

Leapfrogging Effect

Complement Effect

Low Opportunity Indicator High
Sweden Leads. Why?

- Regulatory framework is key
- Excellent communications infrastructure (fixed phone, mobile & Internet)
  - Well-primed early adopters
- Good implementation
  - User-friendly applications
  - Strong security, real and perceived
What about Japan?

Key motivator for users: Convenience

Key inhibitor for non-users: Security and trust concerns


Title: People using Internet Banking and People thinking of using Internet Banking

Answering Questions

What is best investment to improve likelihood of success of eBanking?
+ Infrastructure, Security, Confidence in Gov’t

Which countries show most promise as new markets for eBanking?
+ Infrastructure, Security, Confidence in Gov’t
- Traditional banking convenience
  ATMs, credit cards
Dissecting the Opportunity

- **eBanking**
  - Distinctions among sub-opportunities less important
    - Balance Checking
    - Funds Transfer
    - Bill Payment
    - Trading Shares
    - Purchasing Financial Services
  
- **But may prove more important for other opportunities**
Developing Country Context

What is the current state of readiness for eBanking in Ghana?
Ghana: Overview

- Constitutional democracy with recent democratic transition
- Main export income from gold, timber, and cocoa
- 20 million people, 242k mainlines, 194k mobile subscribers, 80 ATMs, 2 main international banks (Standard Chartered and Barclays) and a number of domestic banks
The Ghanaian Context

- Strong rural/urban divide
  - 80% of people are rural, however 70% of phone lines in Accra
- Multi-cultural and multi-lingual
  - Akan, Moshi-Dagomba, Ewe, Ga
- Low overall managerial skills, computer literacy, written literacy, brain drain
- Strong institutions and rule of law
- Powerful and organizing diaspora communities
- Strong English skills
- Rich in natural resources and strategic location
Requirements for eBanking

<table>
<thead>
<tr>
<th>Basis</th>
<th>Sweden</th>
<th>Singapore</th>
<th>United States</th>
<th>Japan</th>
<th>Ghana</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed telephone lines</td>
<td>per 100</td>
<td>74</td>
<td>47</td>
<td>66</td>
<td>60</td>
</tr>
<tr>
<td>Cellular telephone lines</td>
<td>per 100</td>
<td>79</td>
<td>72</td>
<td>44</td>
<td>59</td>
</tr>
<tr>
<td>Total telephone lines</td>
<td>per 100</td>
<td>153</td>
<td>120</td>
<td>111</td>
<td>118</td>
</tr>
<tr>
<td>ATM/cash dispensers</td>
<td>per million</td>
<td>295</td>
<td>447</td>
<td>991</td>
<td>922</td>
</tr>
</tbody>
</table>

- **Access:** infrastructure levels are generally low
- **Capacity:** lack of managerial skills, technical skills
- **Opportunity:** current low penetration of banking services and technologies (essentially no domestic Internet banking, very limited phone banking)
Applicability of Framework

How do e-Banking issues in other test countries apply to Ghana?

- Security and stability are key drivers
- Regulatory issues, in particular inter-operability and inter-connectivity, central
- Appropriate and well implemented services, user-friendly
- General infrastructure important
Framework for Next-Generation eReadiness

- Think *tools*, not one-size-fits-all rankings
- Extensible data model
  - Add opportunities
- Multiple access methods
  - Answer different types of questions from same data
- Pathway-oriented statistical analysis and visualization
Pilot Study Results

- Developed data model for collection of significant requirements
- Applied data model to determine drivers for success in eBusiness opportunities
- Answered important questions concerning eBusiness opportunity development
  - Developed and developing countries
Goal of Further Research

Understand what’s needed to develop eBusiness opportunities, all over the world