2009. 09. 22

Professor Young-Bin Kwon
Chung-Ang University, Seoul, Korea

ybkwon@cau.ac.kr
Contents

1. Introduction
2. Trend of the World Biometrics Market
3. Korea's Situation for Biometrics
4. Application Examples of Asian Countries

Seoul R&BD Program (10544)
01. Introduction
Introduction(1)

- 9.11 Terror
  - Necessity of Personal Identification by Biometrics
    - Creation of SC37 in JTC1 (2002)
  - Standards on data format, interface, performance testing, etc. are developed.
  - Deployment of other international organization such as ICAO (e-passport/visa), ILO (seafarer's ID) are widely influenced
  - Active role of Asian countries in SC37: Korea and Japan

- Asia’s Meeting for Biometrics: ABC (Asia Biometric Consortium), annual meeting for mutual understanding of Biometric environment and information exchange

- ASEAN Movement: 1st meeting in ASEAN-FBI in Bangkok at June 2009

- Emerging market: Far East (Japan, Korea, China), ASEAN, India, and Middle East

- Biometric industries in Asia: Japan (NEC, Hitachi, Fujitsu) and Korea (LG)

- Application examples between Asian countries

- Korea’s example of Biometric market survey by KBA
ABC (Asian Biometric Consortium)

- Formerly ABF (Asian Biometrics Forum): meeting in Japan at 2002, 1 or 2 times meeting per year with 5 countries (Japan, Korea, Malaysia, Singapore, Taiwan) similar to EBF

- May 11, 2007: Steering committee meeting and selection of secretary office (Korea)

- 1st ABC07: September 26~27, 2007, Suntec Singapore International Convention and Exhibition Centre and Inauguration of ABC (8 Members: China, Indonesia, Japan, Korea, Malaysia, Singapore, Taiwan, Thailand)

- 2nd ABC08: August 25, 2008, Agora garden, Taipei, Taiwan

- 3rd ABC09: September 16~18, 2009, Tokyo International Exhibition Center, Japan (in collaboration with JAISA AutoID EXPO)
02.

Trend of the World Biometrics Market
World Market Size on Biometrics

- World Market Size of Biometrics in 2009: 3,422M
- Compound Average Growth Rate (CAGR): 22.3% (2009~2014)

(Source: IBG, Biometrics Market and Industry Report 2009-2014)
Fingerprint recognition including AFIS is dominant: 2/3 of biometric market

Sustainable incremental estimation: face recognition and iris recognition

---

**Market Volume by Technology**

<table>
<thead>
<tr>
<th>Technology</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fingerprint</td>
<td>971.0</td>
<td>1,380.9</td>
<td>1,740.1</td>
<td>2,064.1</td>
<td>2,422.9</td>
<td>2,827.2</td>
</tr>
<tr>
<td>AFIS/Live Scan</td>
<td>1,309.1</td>
<td>1,489.9</td>
<td>1,816.5</td>
<td>2,154.4</td>
<td>2,525.9</td>
<td>2,965.8</td>
</tr>
<tr>
<td>Iris</td>
<td>174.4</td>
<td>287.8</td>
<td>360.8</td>
<td>480.5</td>
<td>578.3</td>
<td>730.3</td>
</tr>
<tr>
<td>Hand geometry</td>
<td>62.0</td>
<td>62.8</td>
<td>63.7</td>
<td>68.2</td>
<td>76.0</td>
<td>85.0</td>
</tr>
<tr>
<td>middleware</td>
<td>275.0</td>
<td>327.7</td>
<td>413.8</td>
<td>525.2</td>
<td>625.2</td>
<td>732.6</td>
</tr>
<tr>
<td>face</td>
<td>390.0</td>
<td>510.8</td>
<td>675.4</td>
<td>848.5</td>
<td>1,097.3</td>
<td>1,417.8</td>
</tr>
<tr>
<td>voice</td>
<td>103.8</td>
<td>109.3</td>
<td>113.5</td>
<td>136.3</td>
<td>167.5</td>
<td>189.7</td>
</tr>
<tr>
<td>vascular</td>
<td>83.0</td>
<td>102.1</td>
<td>132.2</td>
<td>172.2</td>
<td>199.5</td>
<td>235.7</td>
</tr>
<tr>
<td>others</td>
<td>54.0</td>
<td>85.6</td>
<td>107.5</td>
<td>131.8</td>
<td>154.2</td>
<td>184.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3,422.3</strong></td>
<td><strong>4,356.9</strong></td>
<td><strong>5,423.6</strong></td>
<td><strong>6,581.2</strong></td>
<td><strong>7,846.7</strong></td>
<td><strong>9,368.9</strong></td>
</tr>
</tbody>
</table>

(Unit: M$ USD)
Market Size by Applications (1)

- Current: Market Size of Civil ID and Criminal ID is more than 60%
- Future: Market Size of Civil ID will make a big growth from 39%(2009) to 51%(2014)

**Civil ID**
- "Civil ID is the most biggest application area on Biometrics and shows its high incremental growth rate"
  - e-passport, e-ID, electronic voting, immigration management, etc: Interaction with government for personal identification
  - Annual growth rate: 28.9%, market share of 39.3% on biometrics

**Criminal ID**
- "Implementation of large size fingerprint DB system for domestic crime identification"
  - Interaction with government for law enforcement parts for personal identification
  - Annual growth rate: 14.0%, market share of 24.6% on biometrics

**Access Control / Attendance**
- "Most biggest market size in commercial area and sustainable growth in biometrics"
  - Physical security check
  - Annual growth rate: 10.4%, market share of 17.7% on biometrics
Market Size by Applications (2)

● Device / System Access
  ● “Personal identification on electronic commerce and mobile payment. High growth estimation on application market”
    – personal identification for access and control on server, network, notebook, PC, and mobile equipments
    – annual growth rate: 20.8%, market share of 13.8% on biometrics

● Surveillance
  ● “Foreign traveler check after 9.11 terror and market is growing”
    – Personal identification on specified area or place by closed circuit camera
    – annual growth rate: 49.7%, market share of 2.0% on biometrics

● Consumer ID
  ● “System implementation for personal identification on consumer market”
    – Personal identification for buying goods or services and remote transactions
    – annual growth rate: 18.9%, market share of 3.0% on biometrics
World Market Trend of Biometrics (1)

- Implementation of Large Size Biometrics System in Public Sector
  - FBI Next Generation Identification (NGI)
  - UK National Biometric Identity Service (NBIS)
  - European Visa Information System (EU VIS)

- Continuing M&A by Big Market Stakeholder
  - Motorola(Printrak) by Sagem
  - Digimarc and Bioscrypt by L-1
  - Labcal by Cross Match

- Growth of Commercial Biometric Market
  - Growth of adoption of biometrics technology in Access control, Surveillance, and Attendance Management
  - General deployment of biometric sensors on notebook
  - Biometric Framework Supporting Plan on MS Windows 7
03. Korea’s Situation for Biometrics
Domestic Biometric Survey 2009(1)

- Deployment of e-passport and Visa Waiver Program from US in 2008 (base on existing standards for interoperability)

- Pilot plan for biometrics: immigration service by biometric identification in Incheon international airport and other public sectors (in service)

- Biometrics is not high priority in Korea for the planning of government (conflicting with privacy)

- Many of projects are implemented by system integrators

- Needs of total volume of domestic biometrics market in value chain is increased
Survey on domestic biometrics company and 2009 public pilot projects

Enterprise Categories on Value Chain

1. Solution provider
   - algorithm
   - module
   - sensor

2. Application provider
   - package
   - System integration and installation

Integration

End User

Definition

1. Solution provider
   - It does not provide independently to end user. It is provided to SI companies and application companies. This product is integrated to final product.
   - Module, Sensor, Algorithm, PC/Server Solution, OEM Access Controller which is provided to SI companies

2. Application provider
   - Solutions are provided and embedded by manufacturer. This product becomes a final product with own brand name and supplies to end users directly using logistics network.
   - Access control, Attendance machine, Door lock, Safe box

Examples

2009 public projects on biometrics (quantitative survey)
Survey

- For each biometric company, quantitative data such as general information, main business area, yearly business volume and export volume, future estimation, etc are requested and classified by technology field.

- For product and systems, 3 different categories such as physical access control, logical access control, and public sector are considered.

- Survey period: 21 weeks (from November 2008 to April 2009)

- Voice Recognition is not included
This survey considers 35 companies which is the member of KBA (Korea Biometric Association). Among them, 27 companies are responded (77% recovery rate)

Samples and responses (recovery rate)

- No Answer (8), 23%
- Answer (27), 77%

Distribution of Response Companies

- Solution (3), 11.1%
- Application (13), 48.2%
- Solution and Application (11), 40.7%

- Samples: KBA members and KISIA members: 19 Non-KBA and Non-KISIA members in Biometrics: 16 (Total: 35 companies)
- Response: KBA members and KISIA members: 13 Non-KBA and Non-KISIA members in Biometrics: 14 (Total: 27 companies)
- Among 27 response companies, solution companies are 3 (11.1%), application companies are 13 (48.2%), and solution and application companies are 11 (40.7%).
Total Sales Volume

- Total sales volume including domestic demand and export: 153,500 M KRW. Forecasting of 2009: 202,200M KRW (31.7% increment)

Total Sales Volume and Forecasting in Biometrics

- Increasing public project in 2009
- CAGR: 18.2% until 2012
- Forecasting of total sales volume: 300,000M KRW in 2012

Domestic Demand vs Export (2008)

- Volume of domestic demand: 120,000 M KRW (78.2%)
- Export: 3,350 M KRW (21.8%)
Sales Volume by Technology

- Fingerprint recognition: 137,100 M KRW (90%), Iris recognition: 5,800 M KRW, Face recognition: 5,700 M KRW, Vascular recognition: 4,900 M KRW

Sales Volume by Technology and Forecasting

Market Share by Technology (2008)

- Dominant of fingerprint recognition and this trend will continue for some years. Face recognition will forecast a second largest sales volume among other biometrics

- In 2008, fingerprint recognition shares a 89.3%, iris recognition shares 3.8%, face recognition shares 3.7%, and vascular recognition shares 3.2%
In 2008, Physical access control shares 70% with 107,900 M KRW. Public sector is 39,200 M KRW, Logical access control is 6,400 M KRW.

Public project are continuously increasing.

In 2008, physical access shares 70.3%, public sector 25.5%, logical access 4.2%.
In 2008, volume of export in physical access control is 23,800 M KRW (70%), public sector is 6,800 M KRW, logical access control is 3,000 M KRW.

- In logical access area, export will be increased
- Market of public sector will increase, but export remains similar

In 2008, physical access control shares 70.8%, public sector 20.3%, logical access control 8.8%
**Comments**

- Biometric Guideline by KISA: 57% are known. 86% follows the guideline totally or partially.
- Necessity of Certification of Biometric Guideline: 81%. 60% requests it within 1 year or sooner.

**Timeframe of Certification introduction**

- ASAP, 41.2%
- Within 1 year, 17.6%
- Within 2 year, 29.4%
- Within 3 year, 11.8%

**Government Policy for Industry Promotion**

- Improving law/regulation, 20%
- Human experts and training, 10%
- Government Campaign, 5%
- Increasing public projects, 65%

- Certification on Biometric Guideline request by KNBTC, KISA.
- Government supports are essential for market growth.
04.

Application Examples of Asian Countries
Application Examples of Asian Countries - China

- China
  - Government: Supportive to biometric applications
  - People: Accepting biometric applications
  - Commercial systems appeared in 1993
  - More than 200 industries + more than 100 academia
  - R&D areas: Face, Iris, Fingerprint, Palmprint, Hand, Voice, Gait, Signature, Vein, etc
  - Biometric Applications:
    1. Biometric Self-Service Border-crossing (deployed)
       Shenzhen–Hong Kong: 450,000 border-crossings/day since 2005, Airport service: Beijing, Zhuhai (Macau), 275 gates deployed
    2. Biometric e-passport (in planning)
    3. Access Control – Beijing Olympics (done),
    4. Shanghai World Expo (on-going)
    5. Face Surveillance in Subways (on-going)
Japan

- One of the leading countries in the world
- Many large corporations such as NEC, Hitachi, Fujitsu are considered the leaders in the industry
- OKI and other companies take an important role in SC37 standardization
- Vascular systems are very popular and shows high sales growth rates (Finger, Palm, etc)
- Interoperable transaction of finger vein application (authentication) in Japanese bank system is widely used (more than 60,000 ATMs)
- Border control by Biometrics like USA are deployed since 2008 (Face and Fingerprint images)
Korea

- In Korea, we have KSC37, KNBTC, KISA and KBA (Korea Biometric Association)
  - Many universities and research centers (Ex. BERC)

- Adoption of ISO standards as Korean Standards (Harmonization)

- Industrial products are normally uses international standards for interface and interoperability

- Korea’s international standards
  - Vascular image data format, Conformance test on BioAPI, Multi-modal biometric fusion

- Standards on going
  - DNA data format, performance on fingerprint DB, Conformance on vascular image/DNA

Some typical examples
- Fingerprint: Suprema
- Vascular: Tech-sphere
- ISO standard based products
- KISS for Immigration Services (Korean)
- E-passport for Visa Waiver program
Application Examples of Asian Countries – Korea(2)

- Tech-Sphere
  - Inventor of Vascular technology in the world
  - 1st Prize Winner of Merlion Awards: Open Category (2003) – VP-II
  - ISO 14001, 9001
  - Certificate of New Excellent Product (NEP), MOCIE (2007)
- http://www.tech-sphere.com/
Suprema
- Certificates—CE, FCC, MIC, FBI, UL
- NEP–2006, Korean World Class Product Award, MOCIE, 2006
- ISO 14001, 9001
- http://www.supremainc.com/korean/
**Passport Readers**

**RealPass-S**

One-step Optical and RFID e-Passport Reader

RealPass-S is the ideal e-passport reader for one step reading of OCR characters and RF chip data of ICAO Doc 9303 compliant travel documents and cards. Lay-on document scanning ensures easy operation and better performance in comparison with swipe type readers. Small form factor makes the e-passport reader suitable for narrow space. RealPass-S has a wide range of applications including airlines check-in counter, border control, financial area, and CUSS & kiosk.

**RealPass-V**

Full-page Multi-functional e-Passport Reader

RealPass-V is the best e-passport reader for full page, one step reading of data page and RF chip data of ICAO Doc 9303 compliant travel documents and cards. The e-passport reader ensures reliability and accuracy for authenticating ICAO standard documents as well as issuing passports and e-passports. Lay-on document scanning processes all printed and electronic data of e-passport without additional operation. RealPass-V is widely applied to border control, automated immigration clearance system (autogate), and CUSS & kiosk.

<table>
<thead>
<tr>
<th>HARDWARE</th>
<th>SOFTWARE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RealPass-S</strong></td>
<td><strong>RealPass-V</strong></td>
</tr>
<tr>
<td>![RealPass-S Image]</td>
<td>![RealPass-V Image]</td>
</tr>
<tr>
<td>-</td>
<td>Basic SDK</td>
</tr>
<tr>
<td>-</td>
<td>Passport Quality Verifier, Bio-PQV (Option)</td>
</tr>
</tbody>
</table>
- KISS: Fast Track for Immigration Service