e-Government Standard Framework in Korea

eGovFrame

Jin Won, Choi
2022.2.24
Contents

1. Background & Rationale
2. Introduction to eGovFrame
3. Specifications of eGovFrame
I. Background & Rationale
About NIA (National Information Society Agency)

NIA is a statutory agency founded by Article 10 of the “Framework Act on Informatization Promotion” for the purpose of promoting informatization and supporting the development of related policies for national agencies and local autonomous.

Key Role

- Providing expertise in developing and implementing the National Framework Plan on informatization Promotion
- Managing & operating information networks of public organizations
- Supporting information communication standardization and developing
- Maintaining information systems for inter-agency information sharing
- Supporting information resource management in the public sector
- Supporting supervision, standardization and evaluation of public informatization business
- Providing IT consulting services to developing nations

(www.nia.or.kr)
Korean e-Government

In terms of technological aspects,

- **Semantic Web**
- **Personal Computer**
- **World Wide Web**
- **HTML 5**

Enhance e-Government Services

Happiness

Bridge the digital divide among citizens

Cloud Computing

Mobile Device

Android

IPhone

High Quality of e-Government Services

Build e-Government With Low Cost
Software Framework

“How can we acquire high quality of the e-Government service at low cost?”

Better, Faster Development

Software Framework

Guaranteed Upgradability, Maintenance
Software framework is a special case of software libraries in that they are reusable abstractions of code wrapped in a well-defined API

- Most of the technical issues are handled by SW framework
- With Software framework, you can improve the development productivity by 20-30% and enhance the quality of e-Government services

* IS : Information System, SW: Software
Standardized SW framework reduces costs and improves productivity

- Reduce program steps and man/month by using SW Framework
- Improve Development Productivity with eGovFrame

Service application (without SW framework)

Development area (100% done by developers)

Middleware
Operating system
Hardware

Service application (with SW framework)

Development area (approx. 70~80%)

Middleware
Operating system
Hardware

SW framework used (approx. 20~30%)
Key benefits of Software Framework

- Enhances **SW development productivity**
- Increases **Component Reusability**
- Increases **Interoperability** by using standard interface
- Easy to maintain the system
- Enhances **SW quality** by exploiting source codes pre-qualified
Variety of e-Government systems
Variety of e-Government systems

Software Framework

Software Framework

Software Framework

Software Framework
Challenges and Issues

**SW framework** became an essential tool for e-Government
- 71% of e-Government system from 2004 to 2007 in Korea

* Samsung(SYSTEMiER), LG(LAF/J), SK(JGarnet), HP(Instant/On enterprise), MS(.NET)*

Some barriers were identified in e-Government system

- **Only SW framework provider** can maintain or upgrade applications
- **Redundant development** due to framework differences
- Framework is an **expensive asset** that only **big vendors** can afford
- **A few major IT vendors** dominate the market of e-Government development
- **Unfair competitive environment** to SMEs
Korean government enacted laws, related regulations to encourage both its organizations and development companies to adopt the eGovFrame.
II. Introduction to eGovFrame
eGovFrame is a platform-specific standardized open source framework for public sector IT projects in Korea

**eGovFrame**
- **Basic functions** always needed to develop e-Government system
- **Composition** [eGovFrame + new functions] → **e-Government system**
- **Fair competition environment** created by sharing same basis

---

Ministry of the Interior and Safety
NIA
NATIONAL INFORMATION INFRASTRUCTURE
Vision of eGovFrame

Vision

Improve quality of e-Government services and efficiency of ICT investment

Objectives

- Reuse common functionalities
- Improve Interoperability
- Up-to-date ICT trends
- Remove vendor dependency
- Enhance SMEs competitiveness

Direction

Standardization

- Establish SW framework standard for e-Government
- Provide stable technical infrastructure

Openness

- Ensure the neutrality of eGovFrame
- Open assets to the public & encourage participation

Community

- Share SW tools and technology by education
- Promote the utilization of eGovFrame
eGovFrame helps you to focus on your business logic to increase productivity and quality and reduce costs.
Reducing budget and increasing opportunities for SMEs to participate in business through standardized framework and the reuse of common components

**Past e-Gov. Development**
- A System
  - Application SW
  - Common functions
  - Duplicate development of the same feature in each project
  - Business dependency in subsequent projects
  - Limited opportunities for small business bid
- B System
  - Application SW
  - Common functions
- C System
  - Application SW
  - Common functions

**eGovFrame**
- Define Common Components
- Reuse Common Components

**Current e-Gov. Development**
- A’ System
  - Application SW
  - B’ System
  - Application SW
  - C’ System
  - Application SW

**eGovFrame Center**
- Management System for eGovFrame

- Development based on the standard framework
- Productivity and quality improvement by reusing common components
Worries over eGovFrame

Would it work?

Concerns on project promotion centric by large companies

SMEs

Large companies

Fear on dominated market collapse

Concerns on biz. effectiveness

Government

Public organizations

Concern on stable technical support

Reject the newly developed tools

Developers
Open innovation of eGovFrame

1. Collaboration
- Open Sourcing ‘08~
  - Developed with 11 large and SMEs and shared knowledge
  - Utilized 48 Open Source Software (OSS)

2. Communication
- Open Process ‘08~
  - Collected extensive opinions from over 500 stakeholders
  - Ran over 20 public-private meeting
  - Open Conference and Discussion per year

3. Openness
- Open Outputs ‘09.6~
  - Applied 812 projects
  - 9,938 free training developers
  - Open Source Codes and IPRs
  - Over 814,430 Downloads

4. Symbiosis
- Open Ecosystem ‘10~
  - Founded eGovFrame open community with large and SMEs
  - Established public-private cooperation center
1. Open Sourcing

48 open sources have been selected as the major open sources

11 SW Vendors
- Samsung SDS
- SK C&C
- LG CNS
- Hyundai Information Technology
- C&IS
- Crossent
- utechus
- K4M
- Tmax
- Cyclone
- IL4U

SW Framework Specialized IT Companies

Function Design

Policy Setting

Logical Test

Physical Test

Final Result

48 open sources selected

[Major open sources]
- Biz. transaction: Spring & 23
- Data: MyBatis, ibatis, Hibernate & 1
- Development tool: Eclipse & 4
- Test tool: Junit & 4
- Distribution tool: Maven & 4
- Configuration Management tool: Subversion & 1
- Mobile UX: JQueryMobile & 2
Various opinions and issues from Stakeholders were collected

<table>
<thead>
<tr>
<th>NO</th>
<th>Date</th>
<th>Number of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2008.12.17</td>
<td>35</td>
</tr>
<tr>
<td>2</td>
<td>2009.01.14</td>
<td>29</td>
</tr>
<tr>
<td>3</td>
<td>2009.02.11</td>
<td>22</td>
</tr>
<tr>
<td>4</td>
<td>2009.05.11</td>
<td>21</td>
</tr>
<tr>
<td>5</td>
<td>2009.05.20</td>
<td>224</td>
</tr>
<tr>
<td>6</td>
<td>2009.07.14</td>
<td>26</td>
</tr>
<tr>
<td>7</td>
<td>2010.03.12</td>
<td>200</td>
</tr>
<tr>
<td>8</td>
<td>2010.05.03</td>
<td>11</td>
</tr>
<tr>
<td>9</td>
<td>2010.06.01</td>
<td>25</td>
</tr>
<tr>
<td>10</td>
<td>2010.06.15</td>
<td>6</td>
</tr>
<tr>
<td>11</td>
<td>2010.06.25</td>
<td>10</td>
</tr>
<tr>
<td>12</td>
<td>2010.07.08</td>
<td>13</td>
</tr>
<tr>
<td>13</td>
<td>2010.07.20</td>
<td>19</td>
</tr>
<tr>
<td>14</td>
<td>2011.04.27</td>
<td>26</td>
</tr>
<tr>
<td>15</td>
<td>2011.08.25</td>
<td>7</td>
</tr>
<tr>
<td>16</td>
<td>2011.10.04</td>
<td>7</td>
</tr>
<tr>
<td>17</td>
<td>2011.11.03</td>
<td>400</td>
</tr>
<tr>
<td>18</td>
<td>2012.07.30</td>
<td>22</td>
</tr>
<tr>
<td>19</td>
<td>2012.11.07</td>
<td>34</td>
</tr>
<tr>
<td>20</td>
<td>2012.11.23</td>
<td>350</td>
</tr>
</tbody>
</table>
Whole source codes including outputs are provided at no cost

- **International Recognition**
  
The eGovFrame swept three awards in the FutureGov Awards 2010, leading a field that contained more than 690 nominations from 20 different countries
  - The Government Organization of the Year
  - The Technology Leadership Award
  - The award for Government Transformation of the year

- **CMMI certificate**

  ![CMMI certificate image]

Open Outputs

- Open all the source codes & IPRs (Apache License, Version 2.0)
- Free training provided to more than 11,000 developers
- Applied over 5,000 projects
- Over 900,000 downloads
eGovFrame Center provides technical support, training, compatibility verification and conducts major upgrades and R&D improvement.
For sustainable operation and development, the government has continuously invested its budget and established eGovFrame Center.
III. Specifications of eGovFrame
# Composition of eGovFrame

eGovFrame consists of four environments

<table>
<thead>
<tr>
<th>Environment</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Runtime</td>
<td>Provides common runtime modules for running the SW applications</td>
</tr>
<tr>
<td>Development</td>
<td>Provides a set of efficient tools for developing applications, based on the eGovFrame Runtime Environment.</td>
</tr>
<tr>
<td>Operation</td>
<td>Provides a set of tools to operate information systems based on eGovFrame</td>
</tr>
<tr>
<td>Management</td>
<td>Provides functions for continuous improvement and maintenance of eGovFrame</td>
</tr>
</tbody>
</table>
High reliability with adopting already verified design and sources

**Verified Architecture**

### eGovFrame Runtime Environment

<table>
<thead>
<tr>
<th>Layer</th>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation Layer</td>
<td>Ajax Support, Internationalization, Security</td>
</tr>
<tr>
<td>Business Layer</td>
<td>Biz Process, Exception Handling</td>
</tr>
<tr>
<td>Persistence Layer</td>
<td>HIBERNATE, mybatis</td>
</tr>
<tr>
<td>Batch Layer</td>
<td>Batch Core, Batch Execution</td>
</tr>
<tr>
<td>Integration Layer</td>
<td>Message Service, Apache CXF Web Service</td>
</tr>
<tr>
<td>Mobile Presentation Layer</td>
<td>UX/UI Component, Device API</td>
</tr>
</tbody>
</table>

### Foundation Layer

<table>
<thead>
<tr>
<th>Component</th>
<th>Foundation Layer</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOP</td>
<td>Cache</td>
</tr>
<tr>
<td>File Upload/Download</td>
<td>Compress/Decompress</td>
</tr>
<tr>
<td>Marshalling/Unmarshalling</td>
<td>Encryption/Decryption</td>
</tr>
<tr>
<td>String Util</td>
<td>Excel</td>
</tr>
<tr>
<td>File Handling</td>
<td>IoC Container</td>
</tr>
<tr>
<td>Logging</td>
<td>Resource</td>
</tr>
<tr>
<td>Mail</td>
<td>Scheduling</td>
</tr>
<tr>
<td>Server Security</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- eGovFrame Architecture
- III. Specifications of eGovFrame
- Ministry of the Interior and Safety NIA
## 251 Common components of the reusable software modules

<table>
<thead>
<tr>
<th>Categories</th>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>136 Technical components</strong></td>
<td></td>
</tr>
<tr>
<td>User authentication</td>
<td>3 components including integrated user authentication, general login, etc</td>
</tr>
<tr>
<td>Security</td>
<td>8 components including role/authentication, encryption/decryption, etc</td>
</tr>
<tr>
<td>Statistics</td>
<td>6 components, including access statistics, etc</td>
</tr>
<tr>
<td>Collaboration</td>
<td>28 components, including notice board, community management, etc</td>
</tr>
<tr>
<td>User support</td>
<td>55 components, including user management, FAQ/Q&amp;A, etc</td>
</tr>
<tr>
<td>System management</td>
<td>27 components, including menu, log, system management, etc</td>
</tr>
<tr>
<td>Integration</td>
<td>4 components, including knowledge management, etc</td>
</tr>
<tr>
<td>Digital asset management</td>
<td>5 components, including knowledge management, etc</td>
</tr>
<tr>
<td><strong>11 Mobile Technical components</strong></td>
<td>11 components, including mobile menu, mobile real-time notice, etc</td>
</tr>
<tr>
<td><strong>104 Utility components</strong></td>
<td>104 components, including calendar, web editor, format converter, etc</td>
</tr>
</tbody>
</table>
Versions of eGovFrame

- **Runtime Core Upgrade**
- **Mobile OSS Upgrade**
  - Mobile Web (jQuery Mobile)
  - Mobile Device API (PhoneGap)
- **Common Components Bug Patch**
- **Development Env. Upgrade**
  - Eclipse 4.6 (Neon)

**Ver. 1.0**
- 6, 2009

**Ver. 2.7**
- 12, 2013

**Ver. 3.0**
- 6, 2014

- Core OSS Upgrade
  - Functionality Improvements and Security
- New Functions
  - DB Configuration, Simplified Security Configuration, etc.

**Ver. 3.7**
- 3, 2018

**Ver. 3.10**
- 3, 2021
- Improv. and DB Expansion
  - Runtime Core Upgrade
  - Spring 4.3.25
  - MyBatis 3.5.3
- 2 new database supported
  - PostgreSQL
  - Maria DB
- Mobile Device API Upgrade
  - Apache Cordova 8.1.2
  - Guide Programs for Android / iOS
- Common Components Improved
- Development Env. Upgrade
  - Eclipse 2020-06 (4.16.0)
  - Jenkins 2.263.2
Projects using eGovFrame

Applied eGovFrame to 5,000+ projects in Korea

National SW Framework
eGovFrame

<table>
<thead>
<tr>
<th>Sector</th>
<th>Projects with eGovFrame</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration</td>
<td>National Representative portal</td>
</tr>
<tr>
<td>Transportation</td>
<td>Seoul metropolitan rail transit management system</td>
</tr>
<tr>
<td>Medical</td>
<td>Hospital strategy management system</td>
</tr>
<tr>
<td>Military</td>
<td>War fighting symbology management system</td>
</tr>
<tr>
<td>Customs</td>
<td>Global high-tech port logistics system</td>
</tr>
<tr>
<td>Land</td>
<td>Land information management system</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sector</th>
<th>Projects with eGovframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media</td>
<td>Broadcasting telecommunication integration information system</td>
</tr>
<tr>
<td>Patent</td>
<td>3 Generation Patent net system</td>
</tr>
<tr>
<td>Tax</td>
<td>National tax system</td>
</tr>
<tr>
<td>Port</td>
<td>Incheon U-port system</td>
</tr>
<tr>
<td>Culture</td>
<td>National assembly electronic library system</td>
</tr>
<tr>
<td>Education</td>
<td>National Education Information system</td>
</tr>
</tbody>
</table>

(It is based on Korean Online E-Procurement Service as of March 31, 2021.)
Differences between before and after

<table>
<thead>
<tr>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead to redundant development of similar functionalities in each project</td>
<td>Reduce redundant development cost and time by reusing common components</td>
</tr>
<tr>
<td>Lead to strong dependency on the certain system provider due to the technology reliance</td>
<td>Resolve dependency through standardized development of open sources base</td>
</tr>
<tr>
<td>Disadvantages to SMEs who cannot afford a SW framework</td>
<td>Improve SMEs competitiveness by sharing the Open SW framework at no cost</td>
</tr>
<tr>
<td>Create high degree of maintenance difficulty due to the lack of standards</td>
<td>Ensure convenient maintenance through modularization by providing standard</td>
</tr>
<tr>
<td>Cause significant time and manpower to interoperate between information systems</td>
<td>Enhance interoperability between systems via standardised framework</td>
</tr>
</tbody>
</table>
Thank You

eGovFrame Center
E-Mail : egovframessupport@gmail.com
Tel : +82-1566-3598
Home page : https://egovframe.go.kr/uss/eng/index.do