New Technological Challenge of Geospatial Information Platform (V-world) in South Korea?

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Contents

- V-world overview
- Study overview
- Study results
- Concluding Remarks
Definition

National Geospatial Information Open Platform for Private (V-World)
Concept

V-World

Service

User

Platform

New Service

Personnel  Idea  Enterprise  Contents • Biz  Public institution  Public service

New Service Infra

Service  map  SW  Data  VI

GI  2D GI  3D GI

Infra  HW  SW  N/W

4
History

- 3D T/F 2010
- Pilot service 2011
- R&D 2011
- Nation-wide Service 2012
- Service Enforcement (I) 2013
- Service Enforcement (II) 2014
- Service Enforcement (III) 2015

- Extension of 3D map (130㎢)
- Data API
- Inner & outer map service enforcement
- Mobile Open API service
- OpenAPI 2.0 (web, mobile) enforcement
- Application based service revision

- Pilot region (kangnam, etc)
- Portal service, 3D map service
- Seoul, 6 Metropolitan city
- VI, Integrated map service

- Seoul, 6 Metropolitan city
- VI, Integrated map service

V-world overview
Data provided

- Imagery
  - Korea
  - Baekdusan
  - World
  - Seabed
  - N.Korea

- 3D Building & Topo.
  - 3D Bildg.
  - Topo.

- Boundary & Traffic
  - Korea
  - N.Korea

- Cadastral Map
  - Cadastral Map
  - Themes
  - Map
  - Facility

V-world overview
Data provided - overseas

Supporting the overseas expansion strategy

Satellite Imagery (World)

Overseas’ country

GSD 15m

GSD 500m

(Tokyo Station, Japan)

(Sydney, Australia) (London, England)
Data provided – Antarctic base

Satellite Imagery
- GSD: 50cm
- Area: 242 km²
- Date: 2013

POI
- 204 POI

3D GI
- 3D Bldg. LOD 2
- DEM: 5m

<Korea Antarctic Research Program>

<Jang Bo-go Antarctic Research Station>
Data provided – N. Korea

Satellite Imagery
- GSD: 50cm ~ 1m
- Date: 2011~2012
- Area: 10,800 km²

POI & Hybrid map
- (Approx. 29) POI
- Hybrid map & update

<Satellite imagery>

<Hybrid map>
Data provided – Time series aero photo

**Time series (Seoul/Busan/N.Korea)**

- Map By Times series
- Orthophoto mapping by chronicle
- Loading Times series map to V-world

※ Seoul(78, 89), Seoul(50)), Pyongyang.(50) #15 regions

**Inquiry service**

<1978, Seoul: aero photo> <1989, Seoul>

<1978, Yeouido> <1989, Yeouido> <2009, Yeouido>
## Data provided – Fundamental GI

### 6 GI (2015.3)

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### 39 GI w.r.t administration (2015.3)

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*Courtesy of SPACE*
Background (1)

Map service

Service data

Service data quality

2013 late (courtesy of survey by SpaceN)

Study overview

- 12 -
Background (2)

V-world* server, almost down for due to a keen interest, N. Korea’s image open, and the multi-access of user at the same time.

* National Geospatial Information Open Platform
Aims

- Dealing with new challenges of V-world
  - Re-adjustment of its architecture
  - SW performance reinforcement
  - Introducing web standard
  - Data interoperability technology

- Suggesting the reasonable Plans
Scope of V-World technology

1. INFRA
   - 2D/3DEngine
   - OpenAPI enforcement
   - Mobil
   - Web standard
   - Architecture
   - OpenAPI Based on Web Standard
   - Stable service providing & Applying for next generation’s web service

2. DATA
   - Manufacture
   - Crowd sensing
   - Editing Tool
   - Hybrid DB
   - Hyper Spectral Imaging
   - Acquiring & manufacturing the stable data

3. STRATEGY
   - Strategy development
   - Connecting with Public Platform
   - Overseas’ exporting
   - Application Increase in Private/Public sector
INFRA - Architecture & SW enforcement

V-World Infra

Use of ActiveX Plug-in (3D GI service providing)
- Error in Plug-in setting
- Plug-in service stopping for Web browser
- Security concern for Plug-in

Lack of High precision 2D/3D GI Data processing technologies
- High precision and bulk of GI data

Extension of system since pilot project (2001)
- Lack of system architecture
- Incompletion of system performance/capacity
- Obstacle management in real-time

Cross OS Platform/Browser, Mobile

Displaying high precision 2D/3D GI Data simply

Incensement of user & contents
- Difficulties of system extension

Engine · S/W · Architecture of V-World
INFRA - Architecture & SW enforcement

**V-world GI Architecture**
- Service delay due to traffic
- Lack of data security and response
- Lack of architecture roadmap in system extension

**V-world GI SW**
- MS Windows based GI service (Plug-In)
- Few Open API, Web Service API connection

**High precision 2D/3D GI processing**
- Speed slowness in 2D data when combined
- Lack of combining vector with topography

**Architecture enforcement**
- Security, Emergency Response
- Real-time resource monitoring
- Roadmap for architecture
- Stable service infrastructure

**V-world SW development based on web standard**
- Open Platform based on web standard (No Plug-In)
- 2D/3D service (+mobile) based on Cross platform/browser
- Extension of Open API based on web standard
- (HTML5)

**Speed-up of mash up of high precision 2D/3D**
- Speed-up when combine 2D data (20%)
- Combination of vector with 3D topography in real-time
V-World Data & Contents

Data Intercompatibility

- Lack of Data Intercompatibility
- Lack of single 3D service format

High precision GI processing

- Bulk data
- Limitation of GI data management

VGI service & new contents development

- Lack of VGI service
- Lack of GI contents

- Web-based KML validator
- Public DB connecting Server
- Suggesting 3D service format

- Data processing based on cloud Web-based bulk data management
- LOD construction speed-up

- Extension of VGI service technology

- Strengthening data Intercompatibility
- V-World application increase
DATA - Intercompatibility, Validation, Public Data Connection

Data format check

- Fast access to GI
- Component validation
- Grammar validation

Non-standard data format

- Lack of 3D service format
- Single 3D Service format
- Service standard
- Intercompatibility

Data format validator

- Open source, customizing
- Intercompatibility validation of User Data for v-World

Public data DB connecting server

- Data collecting & categories
- Data processing
- Data transformation
- Data filtering
- Service DB

Study results
DATA – Manufacturing automation & Speed-up

Local server

Raw data
Revision
Division
Settings &
data generating
Fusion
Service

Generation: Cloud based
Service data

Raw data
Revision
Settings
Web
Browser

Service

- 20 -
DATA - GI analysis & prediction, VGI

USER → Passive

http://www.vworld.kr

VGI

Data & contents Sharing 3D modeling,

USER → very Active

Crowd sensing

Data dispaly

Central / Local government

Platform

User/public data

Data analysis on V-World

Mobile

GI manufacturing

2D

Sharing & Manufacturing

3D

GI manufacturing

2D

GI manufacturing

Private management

Study results
2D/3D / Bldg Rendering SW prototype based on WebGL

Study results

Courtesy of ETRI
OpenAPI extension SW based on HTML5

Study results

Courtesy of ETRI
High precision 3D topo+
User GI Mash-up S/W prototype

Study result

Courtesy of EGIS
Web-Based KML Validator

Study results

Courtesy of LX SIRI
2D/3D GI generation and update based on Web Browser

Courtesy of ICTWAY
Concluding Remarks

Developed V-World

Service

User

Platform

New Service

Personnel  Idea  Enterprise  contents • Biz

New Service Infra

Service  map  SW  Data  VI

GI  2D / 3D. Spatial-Temporal  Attribute/VGI/HSI

Infra  HTML5/WebGL  Cloud  Open Source & standard
Acknowledgement

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