S-100 Based e-Navigation Application
Prototype Development

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Dr. JJ Unggyu Kim

e-MARINE
ICT Approach to e-Navigation

- Data Input
- Contents Creation
- Data Gathering

IoT

Big Data
- Info. Production
- Info. Process
- Info. Convergence

Cloud Service
- Public Service
- Social Network
- 3D, Dynamic Service
ICT Convergence Technology Map

Electronic Position Fixing System
GPS, GLONASS, LORAN...

Navigational Sensors
RADAR, Speed Log, Thermometer
ROT, Motion Sensor, TRIM
Engine Monitor, Alarm Monitor
Weather ...

Sensor

ICT Convergence

Comm.

Communication Network
SAN(Ship Area Network), Eithernet, TCP/IP
MMEA, CAN-BUS
Inmarsat, VSAT
Wireless, AP

GIS

Geographic Information System
Geo-Spatial, Hydrographic...

EPFS

S-100 Based e-Navigation Application Development Project

- Funded By Ministry of Industry, Trade and Resources
- 4 Years (2012.6~2016.5)
- Led by e-Marine Co., Ltd

Team: e-Marine, ETRI, DSU, KRISO, INHA UNIVERSITY
... This enables the development of new applications that go beyond the scope of traditional hydrography – for example, high-density bathymetry, sea floor classification, marine GIS, etc. S-100 is designed to be extensible and future requirements such as 3D, time-varying data and web-based services can be easily added when required.
New Marine GIS Standards
- S-100 Standard
- S-101 ENC Standards
- S-102 Bathy Standards
- S-10x Datasets Standards
- S-10x Service Standards

S-100 Applications
- Task 1
- S-100 ECDIS
- Augmented Reality
- Task 3
- S-100 Server Platform & Web/App Service

Task 2
Task 4

IMO CMDS
( Common Maritime Data Structure )

IALA IHDM
( IALA Harmonization Data Model )

IHO UHDM
( Universal Hydro-Graphic Data Model )

e-Navigation
S-10x Multi-Products ECDIS

Vector Data
- S-101 ENC
  - Feature Catalogue
  - Portrayal Catalogue
- S-412 Weather
  - Feature Catalogue
  - Portrayal Catalogue
- S-122 MPA
  - Feature Catalogue
  - Portrayal Catalogue
- S-124 MSI
  - Feature Catalogue
  - Portrayal Catalogue
- S-10X Route
  - Feature Catalogue
  - Portrayal Catalogue

Grid Data
- S-102 Bathy Grid
  - Feature Catalogue
  - Portrayal Catalogue
- S-111 Surface Current
  - Feature Catalogue
  - Portrayal Catalogue

8211 Format
- Feature Catalogue
- Portrayal Catalogue

GML Format
- Feature Catalogue
- Portrayal Catalogue

BAG Format
- Feature Catalogue
- Portrayal Catalogue

HDF-S Format
- Feature Catalogue
- Portrayal Catalogue

S-101 ENC
(Marine Safety Information)

S-122 MPA
(Marine Protected Area)
AR navigation
Augmented Reality

Traffic Lane & Safety Zone

Ship's Position

Heading

Route Plan

Targets (AIS, RADAR)

Wind

Current, Depth

Real Time 3D Visual Data

AR Monitor Example

S-101 ENC Data

Navigational Data

Sensor Data

e-Navigation
underway 2016
AR navigation
Augmented Reality
On-shore Marine Data Service

- Crowd Sourcing
- Cloud Service
- ENC Streaming
e-Navigation is convergence of maritime industry and ICT.

IHO S-100 standard is designed to be extensible and future requirements, such as 3D, Time varying data and web-based services can be easily added when required.

S-100 based e-Navigation Applications are under development to meet the future requirements.

Outcome of S-100 Project, at its initial stage, includes prototype of S-10x Multi-products ECDIS, AR Navigation System and On-Shore S-100 Server Platform & WebApp Service.

The development shall contribute to implementation of e-Navigation into international maritime industry, in terms of technological advance and operational practice.
e-Navigation is underway

JJ Unggyu Kim
CEO/Ph.D

e-NAVIGATION & SMARTSHIP Solution http://www.eMARINE.co.kr

5F Adora Tower, 272, Toegyero, Jung-Gu, Seoul, 100-855, Korea
Tel. 82-70-7204-9313 Fax. 82-2-2266-9666
4F 30, Jeongdong-Ro, Nam-Gu, Ulsan, 680-871, Korea
Tel. 82-70-7204-9289 Fax. 82-52-247-9666
Mobile: 82-10-4922-6150 e-Mail: ukgim@eMARINE.co.kr