Information Scientist needs for Environmental Modeling and Understanding
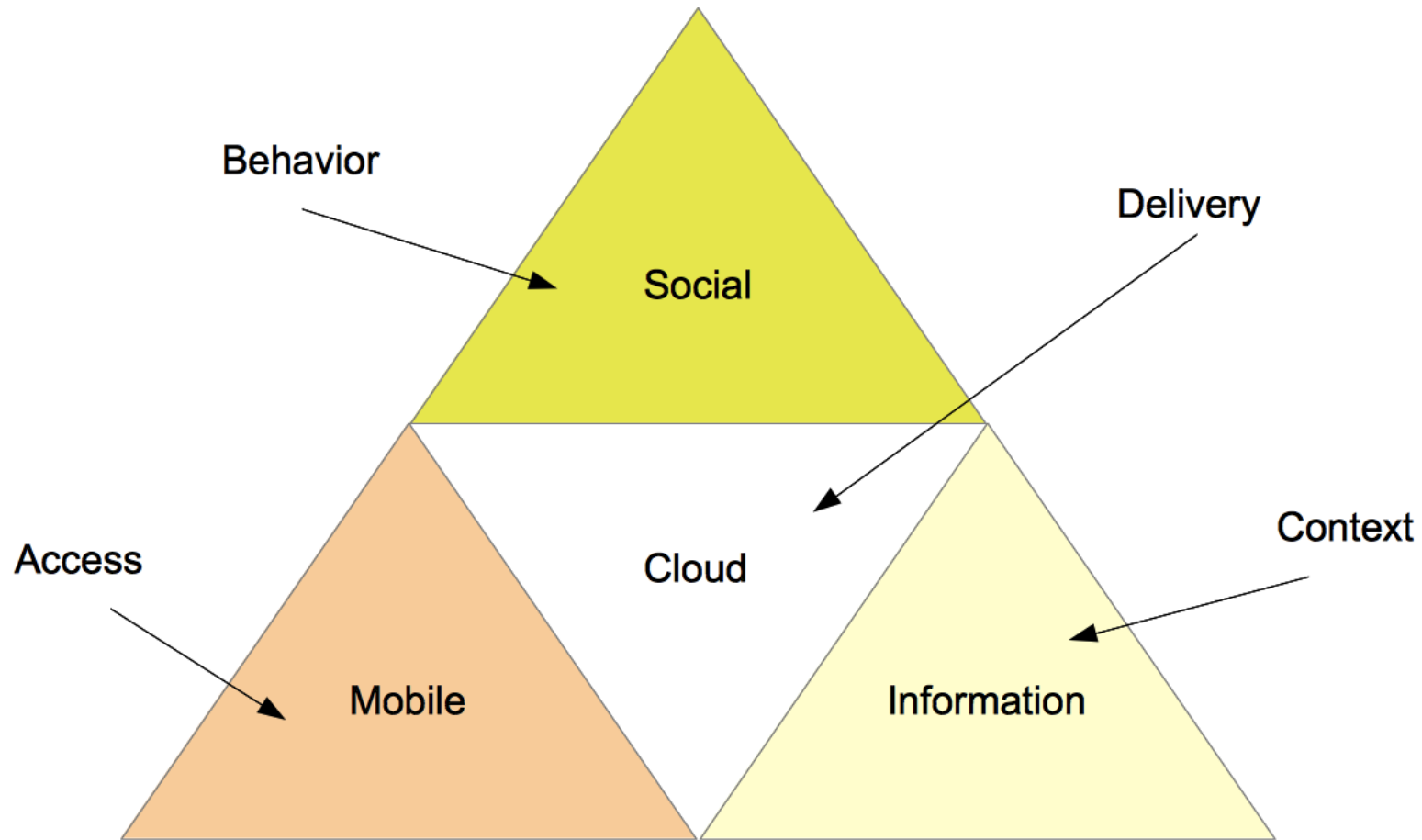
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National Electronics and Computer Technology Center (NECTEC), Thailand

Gartner Top Predictions for 2012

Four forces are shaping the future of IT

Gartner Top Predictions for 2012: Control Slips Away

What are we collecting?

- Water levels in the rivers and canals in the target area are measured by sensors.

- Sensors are installed in a coral reef of Racha Yai Island near Phuket Island. Water conductivity, temperature and depth data are recorded.

- Data of rainfall quantity, temperature, and humidity in the mountainous area of Mae Hong Son and Chiang Mai provinces are transmitted via GPRS timely to the server for landslide prediction.

- Environmental cultural data are reported from provinces and school communities of border petrol police.

Information Scientist Needs for Environmental Modeling and Understanding

- Environmental Monitoring System (temperature, humidity, and rainfall quantity)

- GPS-based Traffic Information Analysis & Data Mining for Urban Environment (urban taxi GPS information)

- Underwater Environmental Monitoring and Analysis System (water conductivity, temperature, and depth)

- Cultural Tourism with Spatial-Temporal Computing (urban taxi GPS information, Environmental cultural information)

Underwater Environmental Monitoring and Analysis System
---Coral Virtual Site at Racha Island, Phuket, Thailand---

- In this study, we collect information using all available technology e.g. temp/light intensity sensors, ecocam coral monitoring, field photos and videos, and 360 degree panoramic photos.

- All of these information should provide virtual environment of the island to Thai students throughout Thailand for their learning inquiries.

- Collected data : conductivity, temperature, and depth

- Collaboration : Walailuk University, NECTEC

Ecocam Data

- Images were transferred real-time online into an FK-RJ2604 device.

- Experimental Push and pull operations are used to transfer streaming data to Data turbine

- Observation of the coral reef using the Coral Virtual Site System started on 8 February 2010 .

Issue: underwater tracking and mapping system

Environmental Monitoring System
---Flash Flood and Landslide Warning System---

- 243 stations covering 22 districts in Chiang Mai

- Collaboration : Chiang Mai Province, Dept. of Disaster Prevention and Mitigation, NECTEC
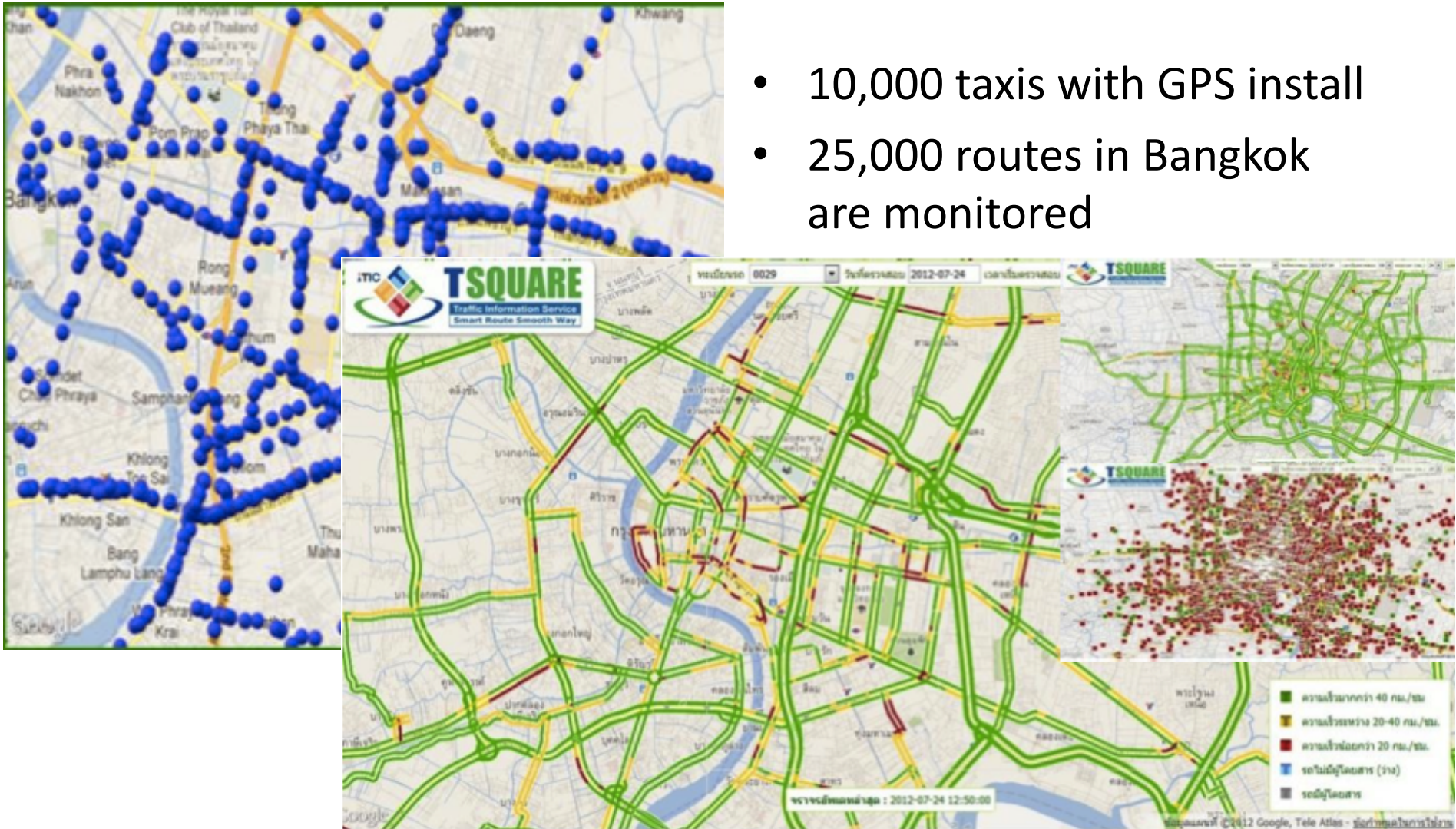
Environmental Monitoring System

- Collected data :
temperature, humidity,
and rainfall quantity

Issue: site failure detection,
        landslide predicting and warning system

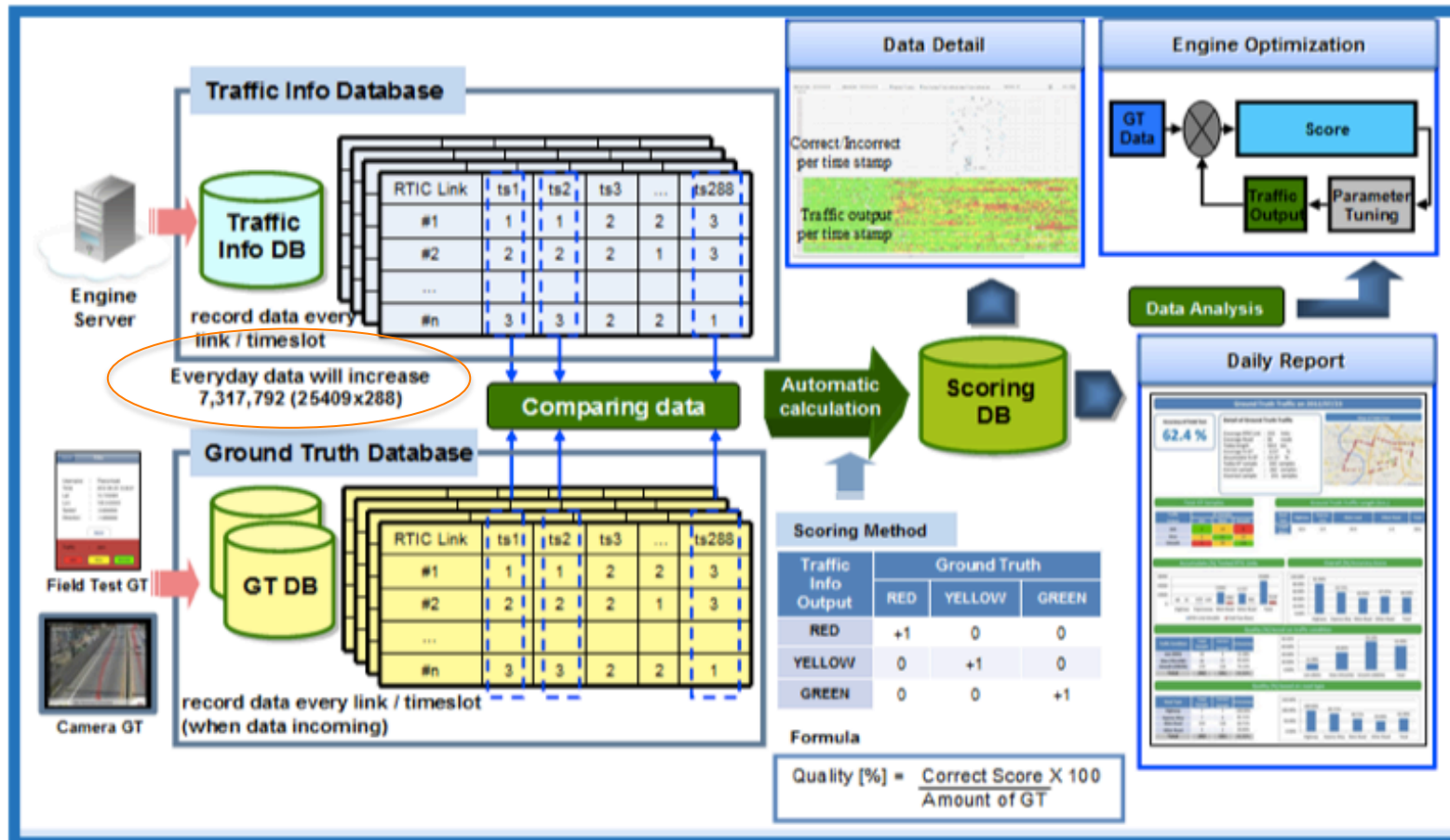# GPS-based Traffic Information Analysis & Data Mining for Urban Environment

- 10,000 taxis with GPS install
- 25,000 routes in Bangkok are monitored

Source: TTET for TSQUARE Traffic Information Service

GPS-based Traffic Information Analysis & Data Mining for Urban Environment
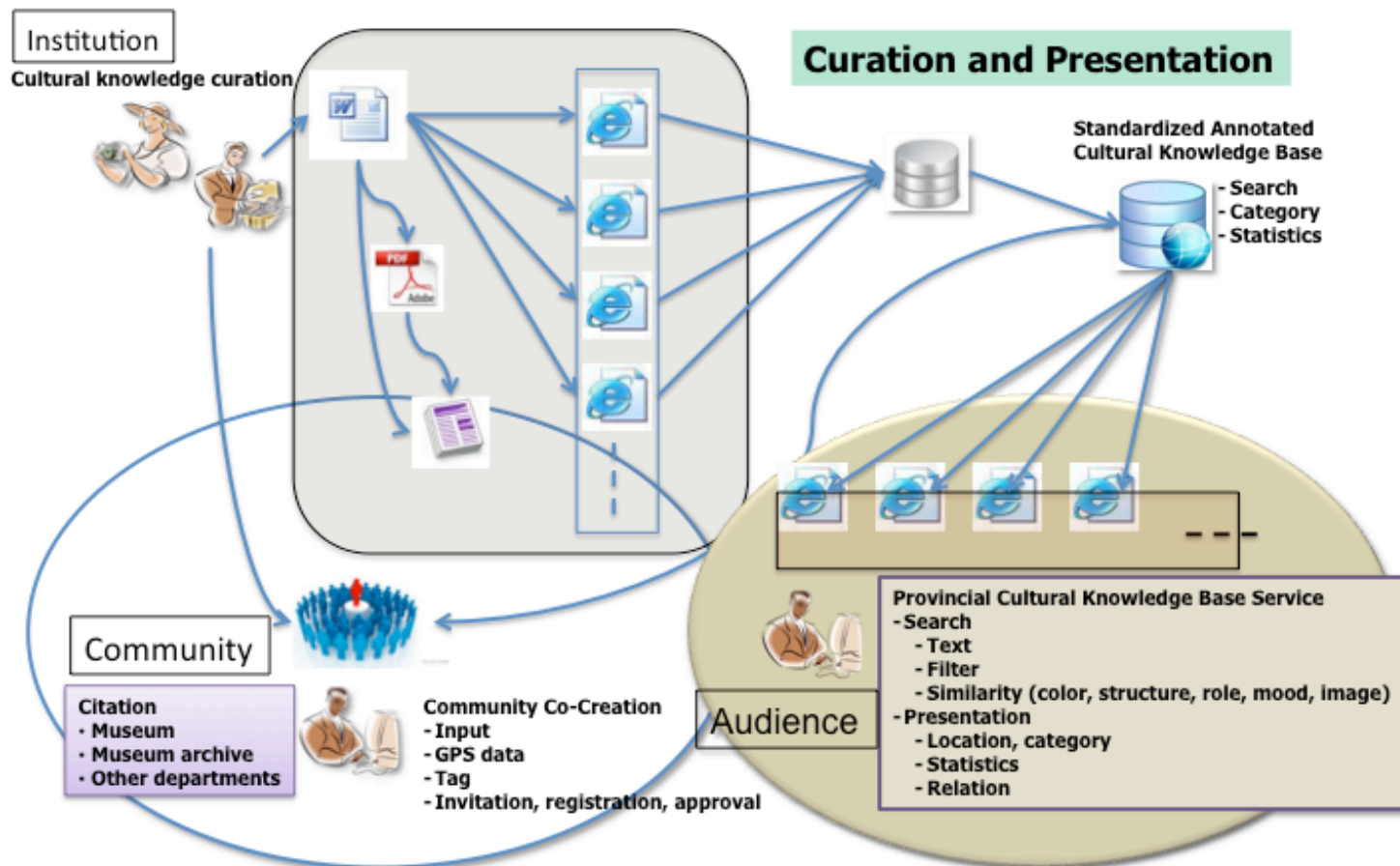

70%

Source: TTET for TSQUARE Traffic Information Service

Cultural Tourism with Spatial-Temporal Computing

- Collected data : Cultural information from 77 provinces

- Collaboration : Ministry of Culture, NECTEC

Institution
Cultural knowledge curation

Curation and Presentation

Standardized Annotated
Cultural Knowledge Base
- Search
- Category
- Statistics

Community

Citation
- Museum
- Museum archive
- Other departments

Community Co-Creation
- Input
- GPS data
- Tag
- Invitation, registration, approval

Audience

Provincial Cultural Knowledge Base Service
- Search
  - Text
  - Filter
  - Similarity (color, structure, role, mood, image)
- Presentation
  - Location, category
  - Statistics
  - Relation

Cultural Tourism with Spatial-Temporal Computing
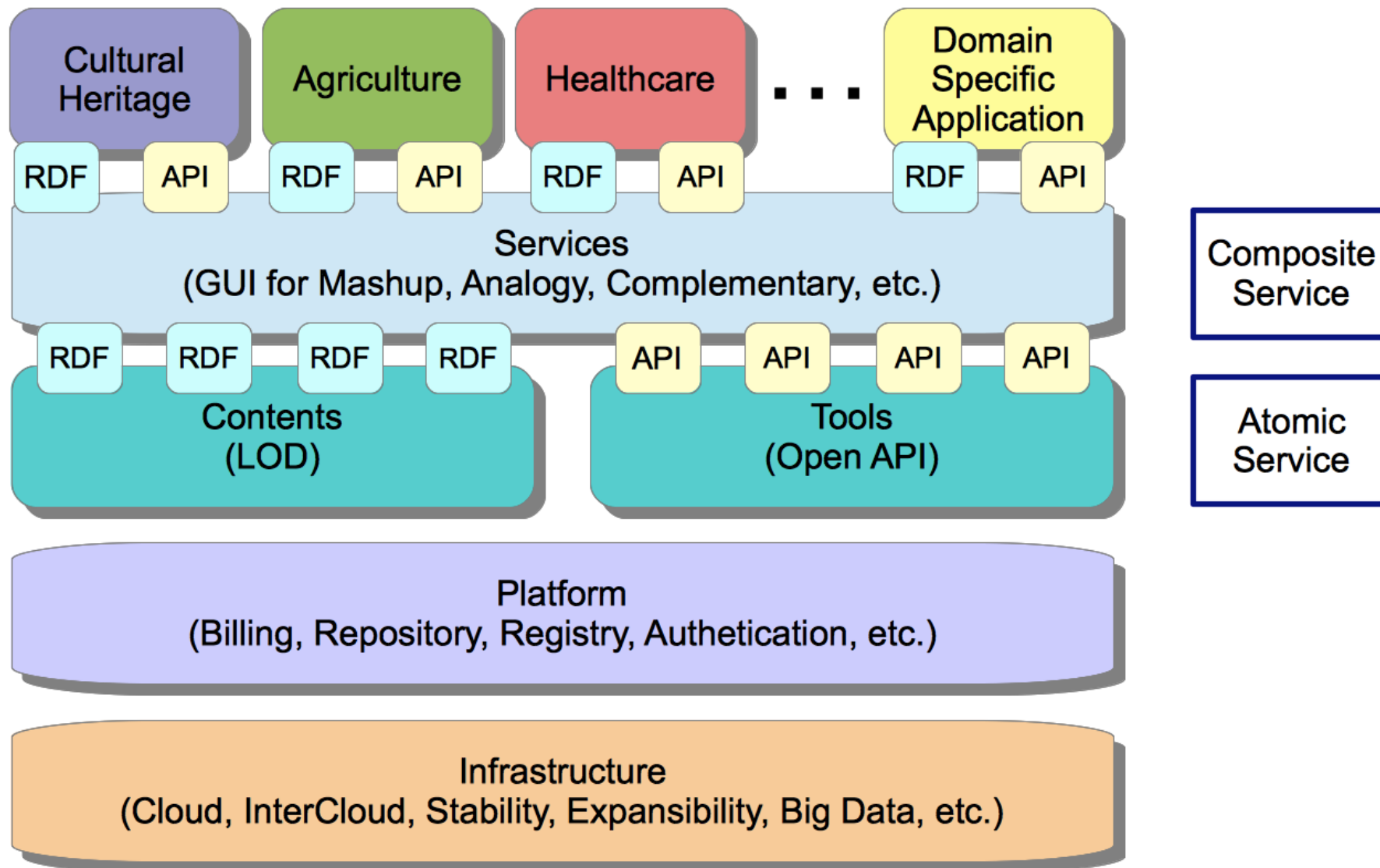## ---Cross-Border Cultural Environment---

- Cultural data 139,243 spots (19 Feb 2013)

- Border School 169 areas

Framework

Cultural Heritage · RDF · API

Agriculture · RDF · API

Healthcare · RDF · API

· · ·

Domain Specific Application · RDF · API

Services
(GUI for Mashup, Analogy, Complementary, etc.)

RDF · RDF · RDF · RDF

API · API · API · API

Contents
(LOD)

Tools
(Open API)

Composite Service

Atomic Service

Platform
(Billing, Repository, Registry, Authetication, etc.)

Infrastructure
(Cloud, InterCloud, Stability, Expansibility, Big Data, etc.)

Skill Needs for Environmental Scientist

- Problem modeling and understanding

- Data collection and analysis

- Information scientist being

- Innovative solution initiative

Leadership

Innovative

Information