Information Scientist needs for Environmental Modeling and Understanding

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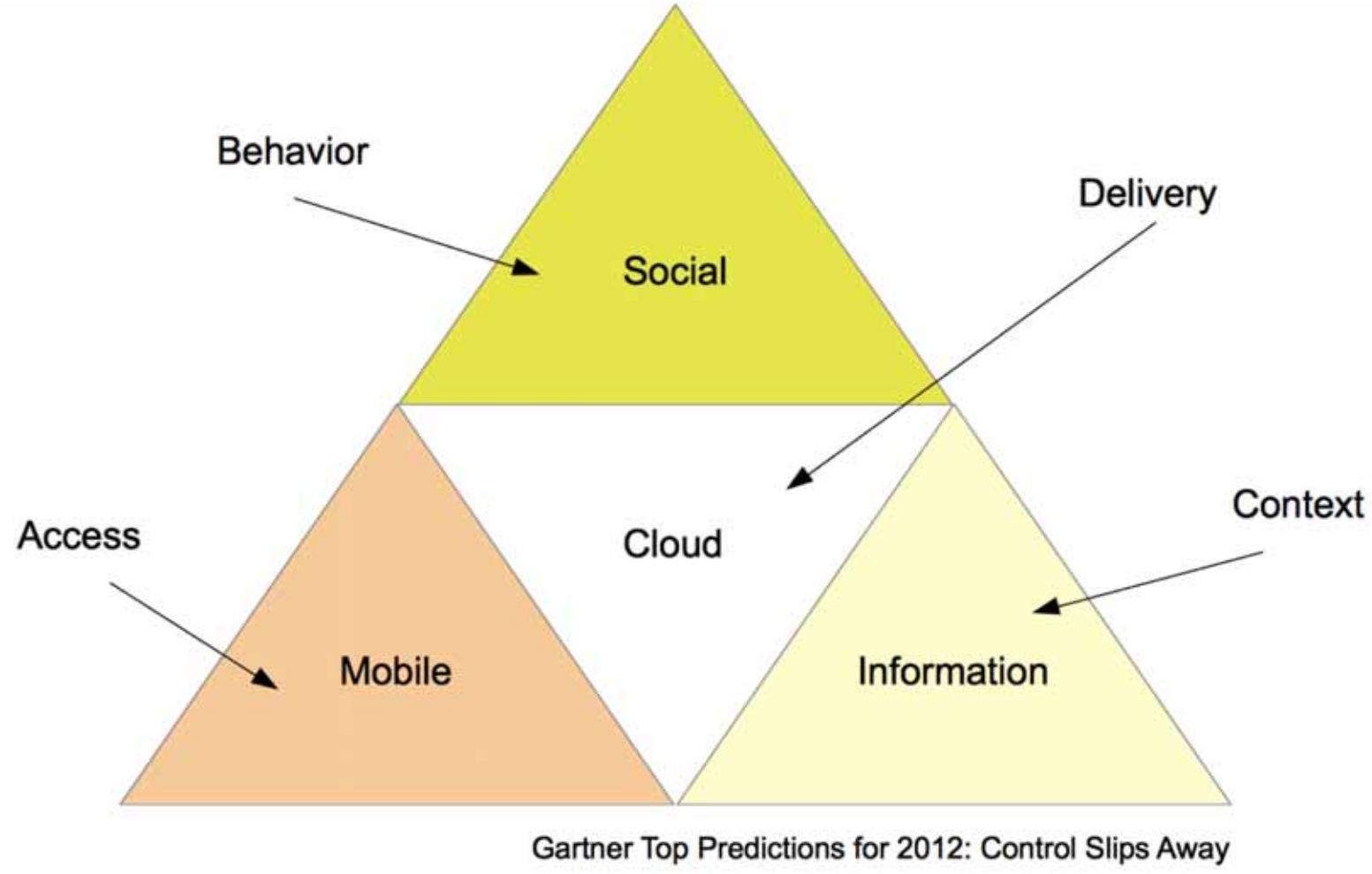
Gartner Top Predictions for 2012

Four forces are shaping the future of IT



Four forces are shaping the future of IT

Functional expression

- Access(Mobile):- Fixed => Movable
- Behavior(Social):- Local => Global
- Context(Information):- Private => Public
- Delivery(Cloud):- Individual => Virtual

World Most Active Social Media in 2012

- Facebook
  - Over 1 billion active users
    (world 7,106m, China 1,325m, India 1,129m, US 301m, Thailand 67m)
  - 750,000,000 - Estimated Unique Monthly Visitors*
- Twitter
  - 140 active users, 340 million tweets per day
  - 250,000,000 - Estimated Unique Monthly Visitors*
- Youtube
  - 4 billion videos viewed per day
  - 450,000,000 - Estimated Unique Monthly Visitors*
- LinkedIn
  - 95 percent of companies that find and attract employees using LinkedIn
  - 110,000,000 - Estimated Unique Monthly Visitors*
- Flickr
  - More than 6 billion photos hosted on Flickr
  - 90,000,000 - Estimated Unique Monthly Visitors *
- Smartphone
  - 56 percent of all mobile users access the internet**

*http://www.ebizmba.com/articles/social-networking-websites
**http://marketingland.com/pew-56-percent-of-all-mobile-users-access-the-internet-27205

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---

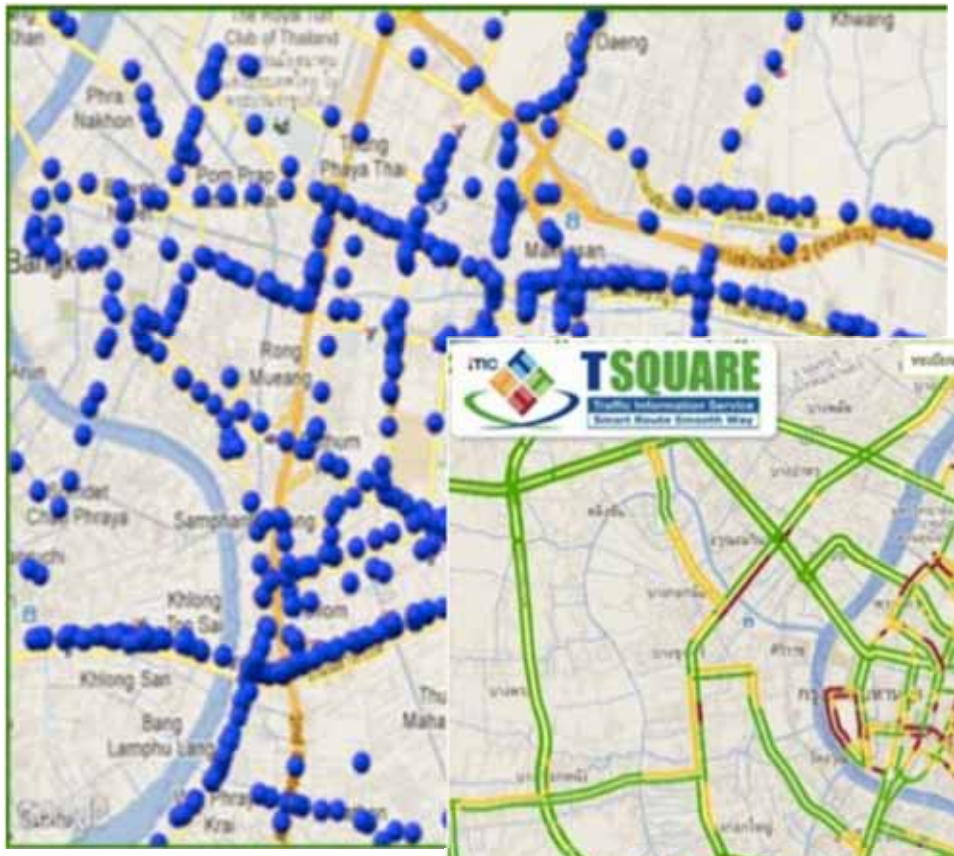
- 243 stations covering 22 districts in Chiang Mai
- Collaboration : Chiang Mai Province, Dept. of Disaster Prevention and Mitigation, NECTEC

Environmental Monitoring System

- Collected data : temperature, humidity, and rainfall quantity

Issue: site failure detection,
landslide predicting and warning system

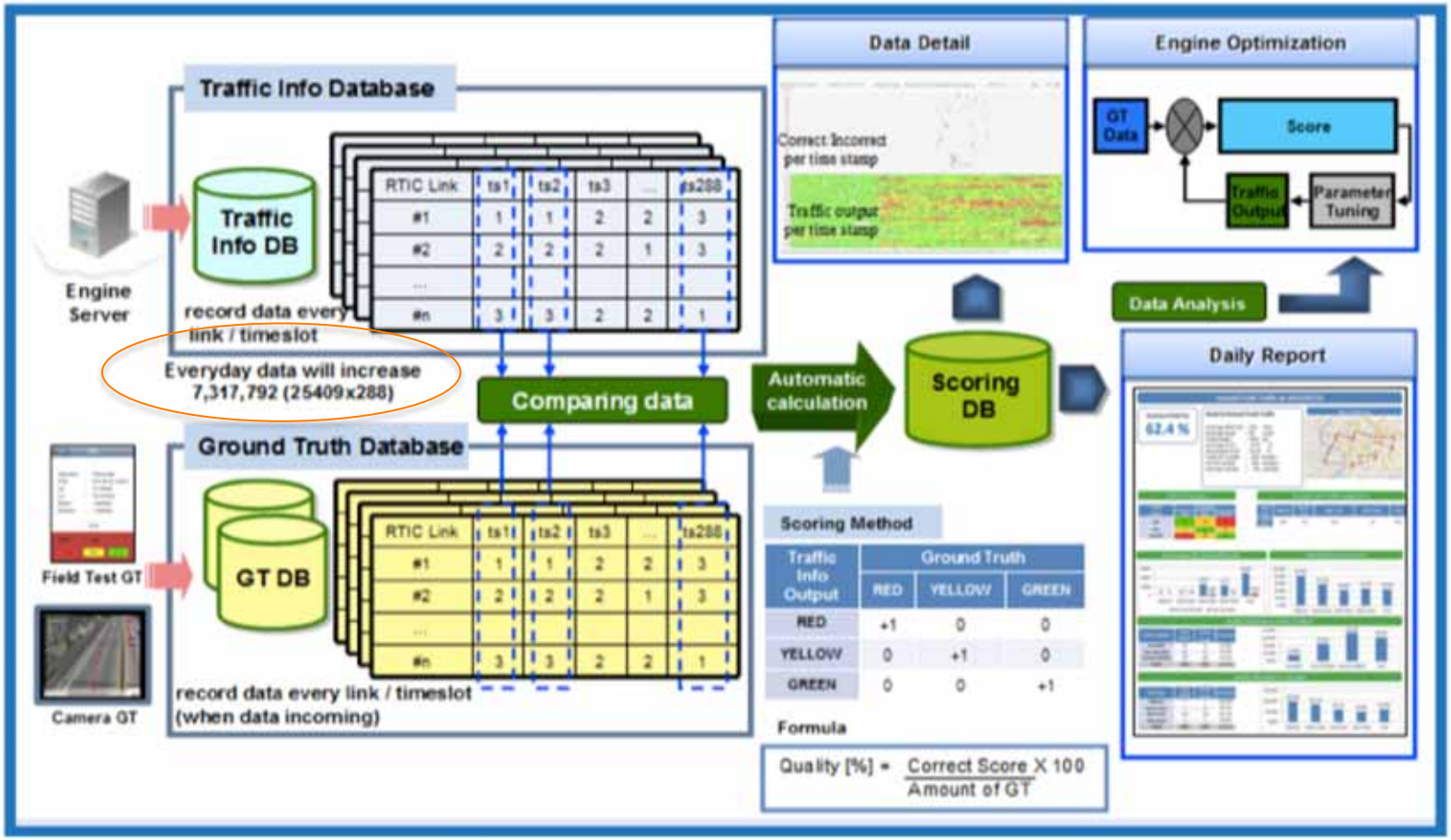
GPS-based Traffic Information Analysis & Data Mining for Urban Environment



- 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

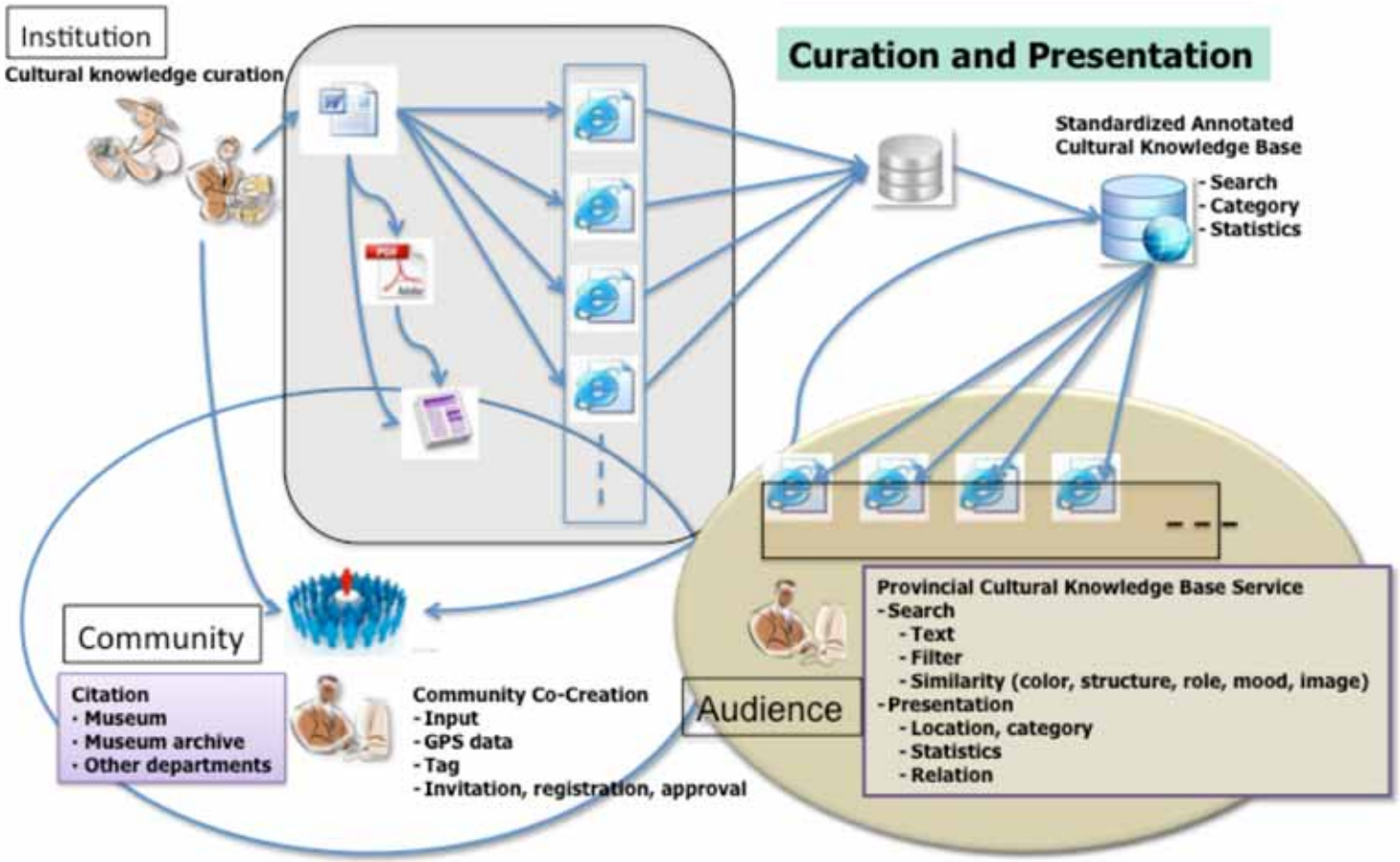


70%

Source: TTET for TSQUARE Traffic Information Service

Cultural Tourism with Spatial-Temporal Computing

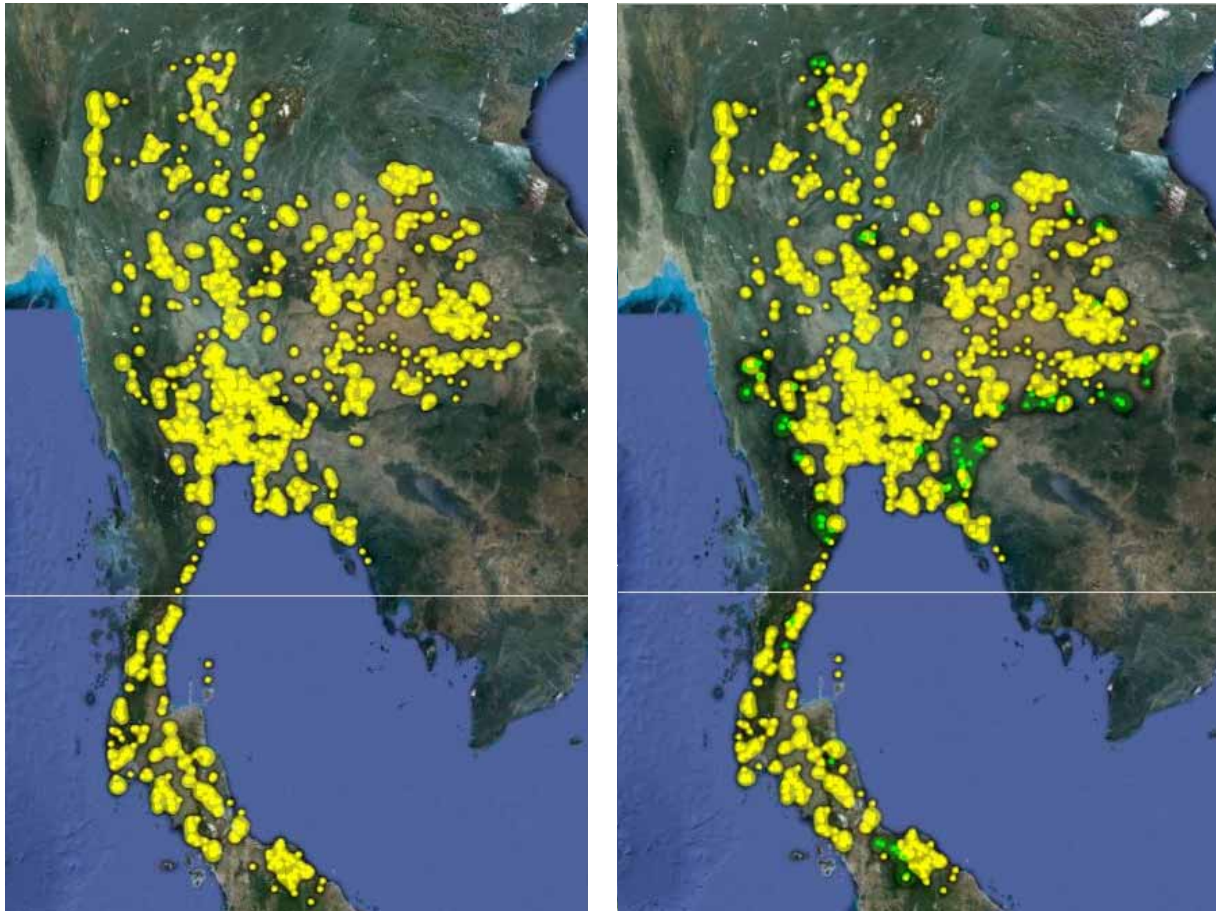
- Collected data : Cultural information from 77 provinces
- Collaboration : Ministry of Culture, NECTEC



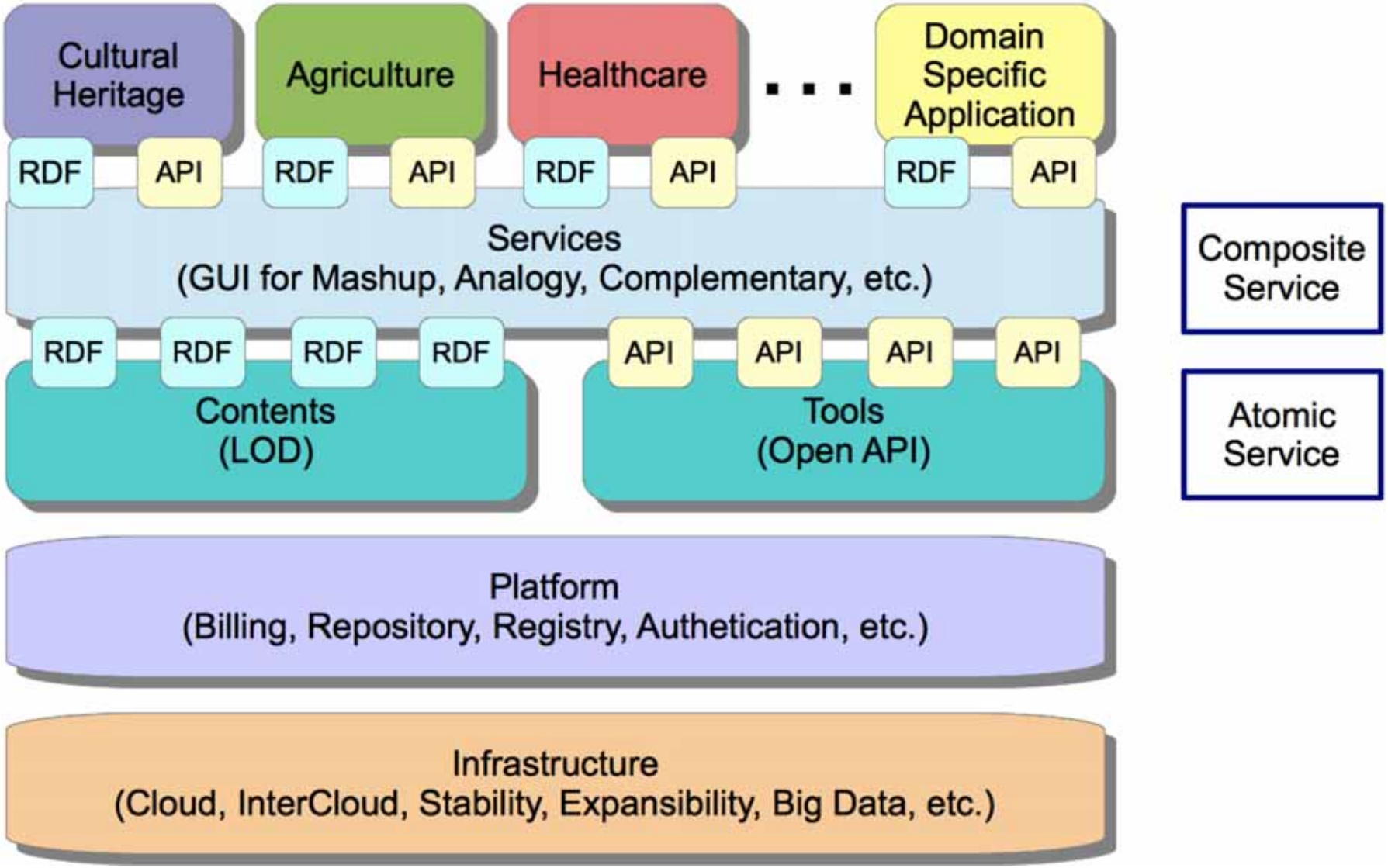
Cultural Tourism with Spatial-Temporal Computing

---Cross-Border Cultural Environment---

- Cultural data 139,243 spots (19 Feb 2013)
- Border School 169 areas



Framework


Cultural Heritage
Agriculture
Healthcare
. . .
Domain Specific Application
RDF
API
RDF
API
RDF
API
RDF
API
Services
(GUI for Mashup, Analogy, Complementary, etc.)
RDF
RDF
RDF
RDF
API
API
API
API
Contents
(LOD)
Tools
(Open API)
Platform
(Billing, Repository, Registry, Authetication, etc.)
Infrastructure
(Cloud, InterCloud, Stability, Expansibility, Big Data, etc.)
Composite Service
Atomic Service

Skill Needs for Environmental Scientist

- Problem modeling and understanding
- Data collection and analysis
- Information scientist being
- Innovative solution initiative