DIGILE | DATA TO INTELLIGENCE

Data to Intelligence (D2I)
Research Programme on Intelligent Data-Driven Services

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SHOKs

Tekes

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- The Strategic Centres for Science, Technology and Innovation (SHOK) are new public-private partnerships for speeding up innovation processes. Their main goal is to thoroughly renew industry clusters and to create radical innovations.
- SHOKs develop and apply new methods for cooperation, co-creation and interaction. International cooperation also plays a key role in the operation of the Strategic Centres. Testing and piloting environments and ecosystems constitute an essential part of the Strategic Centres' operations.

CLEEN
Cluster for Energy and Environment
Energy and Environment Cluster CLEEN

FIBIC
FINNISH BIOECONOMY CLUSTER
Finnish Bioeconomy Cluster FIBIC

fimecc
Finnish Metals and Engineering Competence Cluster
Finnish Metals and Engineering Competence Cluster FIMECC

SalWe
Strategic Centre for Health and Wellbeing SalWe

RYM Oy
Built Environment Innovations
Built Environment Innovations Cluster RYM

DIGILE
DIGILE

Digile

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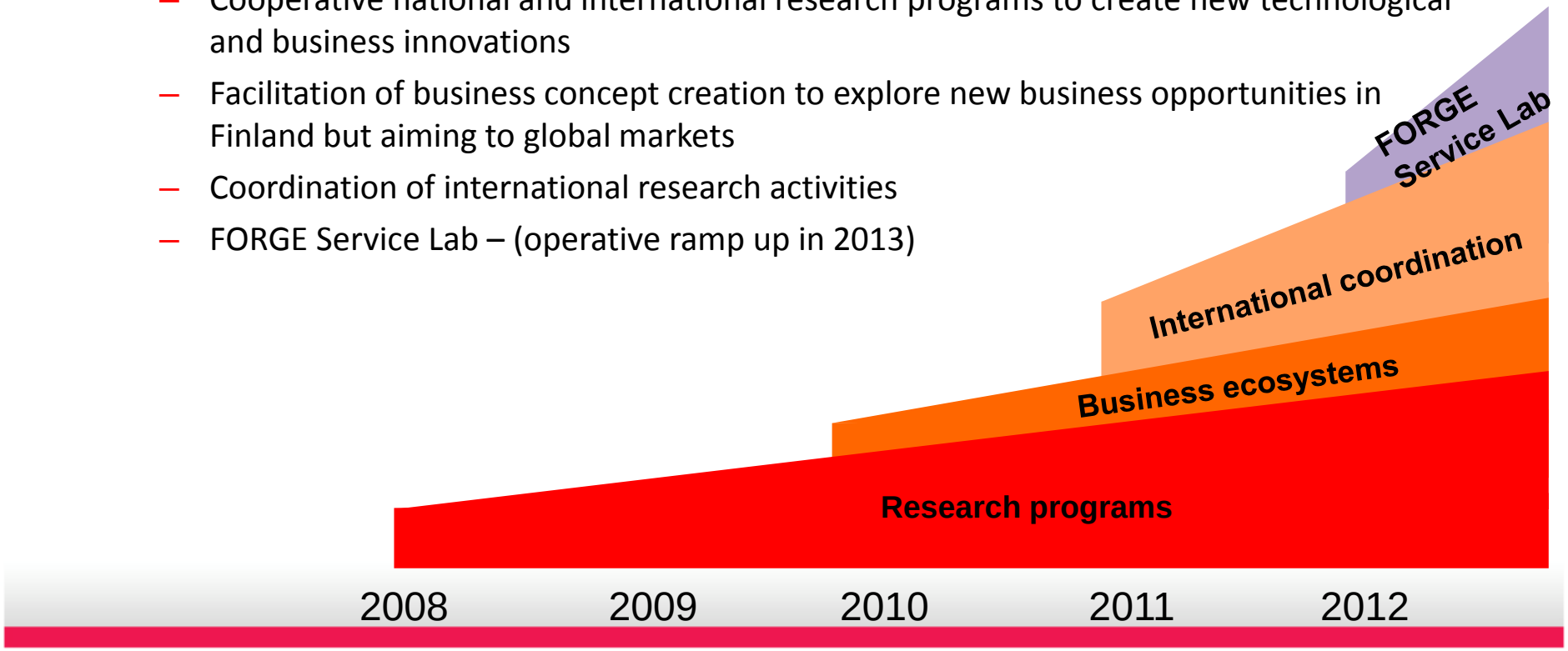
- DIGILE: Center for Science, Technology and Innovation (SHOK) in the digital business and services, since 2008
- **Mission: DIGILE creates digital business ecosystems to enable new global growth business for DIGILE's owners and partners**

- Services include:
  - Cooperative national and international research programs to create new technological and business innovations
  - Facilitation of business concept creation to explore new business opportunities in Finland but aiming to global markets
  - Coordination of international research activities
  - FORGE Service Lab – (operative ramp up in 2013)



Digile Board of Directors 2013

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Digile Research Programs

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- Strategic Research Agendas (SRAs) :
  - overriding themes and focal points of a research program
  - a description of the program context
- Current SRAs:
  - Cloud Software
  - Digital Services
  - Internet of Things (IoT)
  - Need4Speed (N4S)
  - **Data to Intelligence (D2I)**
- FORGE Service Lab: development laboratory for digital (cloud) services
  - hosted by CSC

D2I SRA VISION AND MISSION

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- Vision 2015
  - We have developed the necessary intelligent methods and tools for managing, refining and utilizing diverse data pools
  - The results enable innovative data-intensive business models and services

- Mission
  - To boost Finnish international competitiveness through intelligent (context-sensitive, personalized, proactive) data processing technologies and services that add measurable value
  - To support the global trend, and contribute to such emerging ecosystems that boost Finnish international competitiveness through intelligent (context-sensitive, personalized, proactive) data processing technologies linked to new data-driven services that add measurable value, leading to increased knowledge, comfort, productivity or effectiveness
  - The target is reached by developing intelligent methods and tools for managing, refining and utilizing diverse data sources, and by creating new, innovative data-intensive business models and services based on these methods.

IMPLEMENTATION FACTS

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- Driving company: Tieto

- Whole program (estimate)
  - 2012-2015

340 person years
39,7 M€ total cost
60/40 funding model
16,0 M€ company funding
19,5 M€ TEKES funding

- 2013
  - 13 large companies
  - 6 SMEs
  - 10 research institutes
  - WPs:
    - OS – Organisation, Services
    - MA – Methods, Algorithms
    - DT – Data, Technology

60 person years
7,05 M€ total cost
60/40 funding model
2,84 M€ company funding
3,50 M€ TEKES funding

D2I Partners (2013)

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- Aalto
- Big Data Solutions
- CENTRIA
- Datactica Oy
- EC-Tools
- FMI
- FMI Commercial Services
- Fortum
- F-Secure Corporation
- Gisforest
- Ineo
- John Deere Forestry
- Kesko Oyj
- Konecranes
- M-Brain
- Metso
- Mirasys Ltd.
- Mobisoft
- Exfo (NetHawk)
- Nokia
- Noptel
- Packet Video
- Pelastusopisto
- Saab Systems Oy
- Tampere University of Technology
- Tieto
- University of Helsinki
- University of Oulu
- Turku School of Economics
- Vidamin
- VTT Technical Research Centre of Finland (VTT)
- Åbo Akademi University

Big Data: problems and opportunities

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- Data is **BIG:**
  Need methods for (automated) predictive big data analytics
- Data is **HETEROGENEOUS:**
  Need methods for integrating heterogeneous and parceled data sources
- Data is **HARD TO UNDERSTAND:**
  Need methods for visualization/summarization to support informed decision-making
- Data needs to be **ACCESSED:**
  Need methods for accessing context-sensitive, on-line, open and role based personalized information
- Data is **NOISY:**
  Need methods for filtering, pruning, cleansing and enriching data
- Data enables **INTELLIGENT DATA-DRIVEN SERVICES:**
  Intelligent meaning adaptive – proactive – context-sensitive – personalized

Example: Predictive browser

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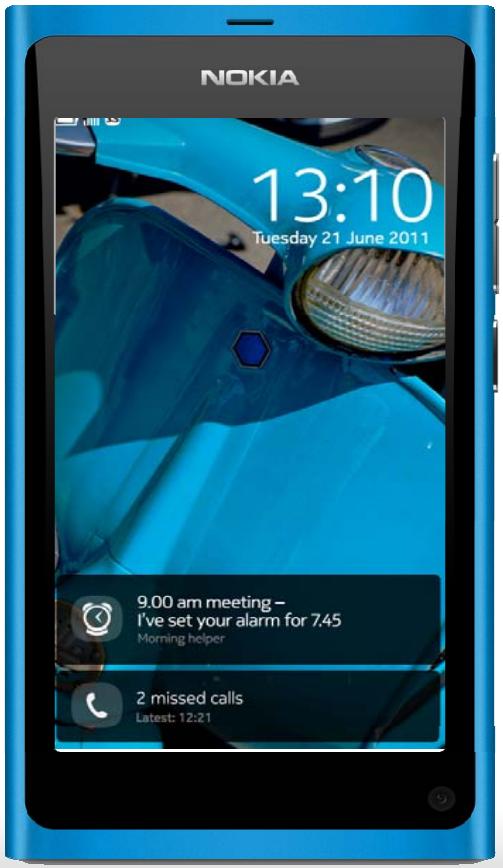
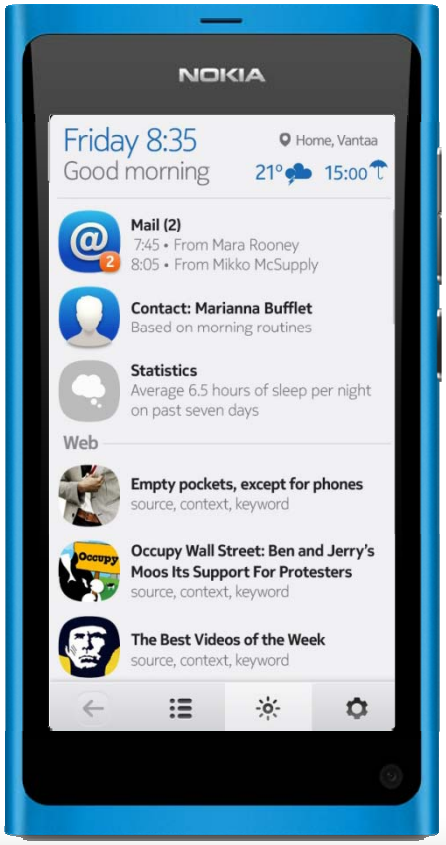
Predictor engine: 1) predicts the suitable alarm time,
2) news, feeds and apps relevant for this morning

1. Notification: evening before
"we have set the alarm for you"



2. Predictor app: evening before
"timeline how your alarm is predicted – need to adjust?"

3. Predictor app: after closing
the alarm "news, feeds and apps
relevant for you this morning"



Example: Context intelligence for marketing

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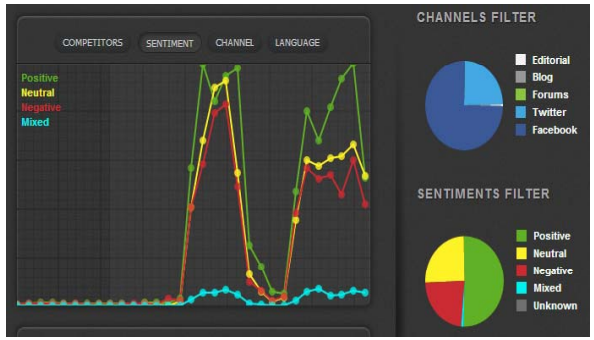
- Data is real-time harvested global media data, in the context of a wide range of channels, both editorial and social, over 20 languages
- Automatically enriched with sentiment and semantics
- Target group is communications, PR and marketing professionals who have a need to measure the media response to their activities over time and in context
- Detects media events relevant to the activity objectives
- Allows competitive intelligence



Example: visualization of accidents

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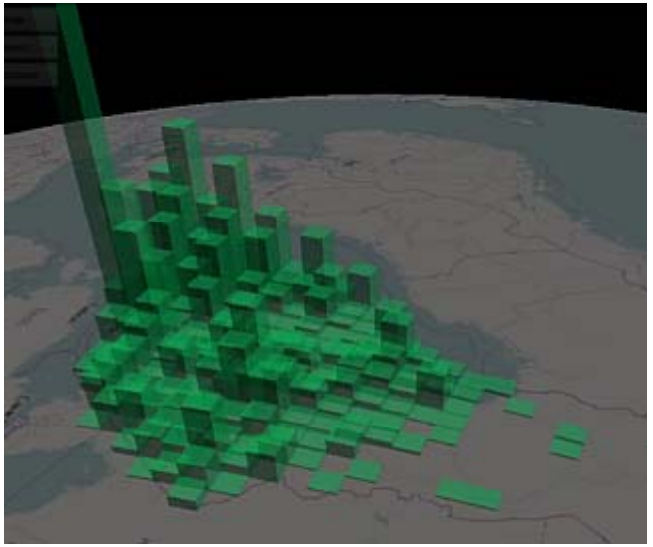
- Saab Systems has developed visualization component called Gravity for different kind of visualizations needs like:
  - Geographical visualization
  - 3D modeling
  - Animation
- Gravity's geographical visualization capabilities are piloted using Pronto accident statistics data as a UI for discovering geographical trends and anomalies in occurrence of accidents
- Accidents location with specified timeframe are presented as a grid or as a surface, in addition accident location are visualized with animation (For example how the storm hits Finland in December 2011)



Storm hits Finland December 26th 2011

Accidents of Helsinki as Grid December 2011

Example: augmented reality shopping cart

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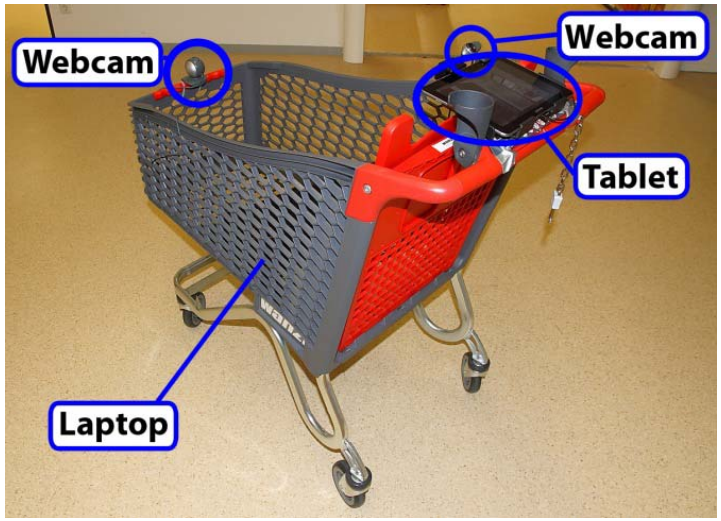
- Shopping cart instrumented using a tablet and a webcam
- Multimodal navigation support using tactile preview cues and a see-through augmented reality feed
- Tablet provides large screen-estate ➔ possibility to interleave personalized advertisements within navigation activities
- User study with 30 participants
  - Tactile and visual feedback effective in guiding the user
  - Tactile preview cues reduce visual attention requirements and navigation errors



Example: traffic-related data analysis

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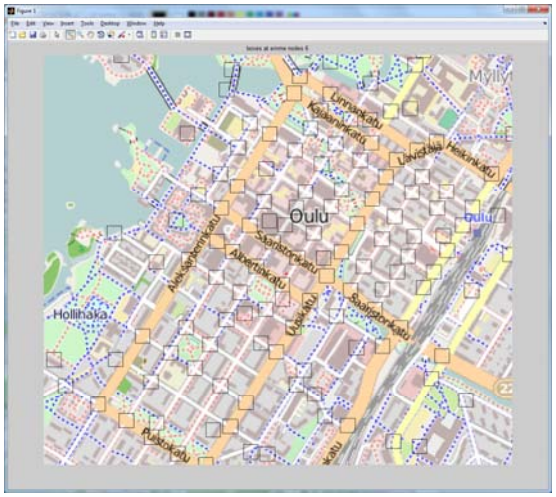
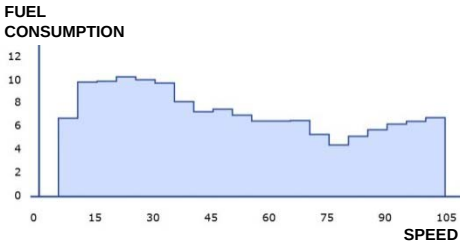
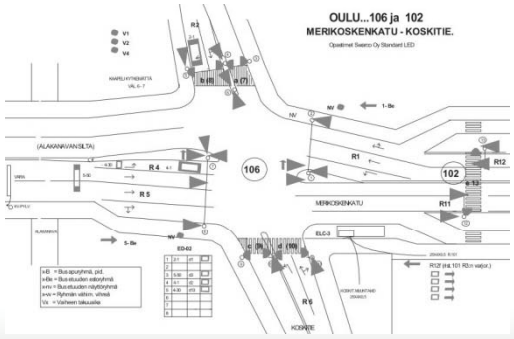
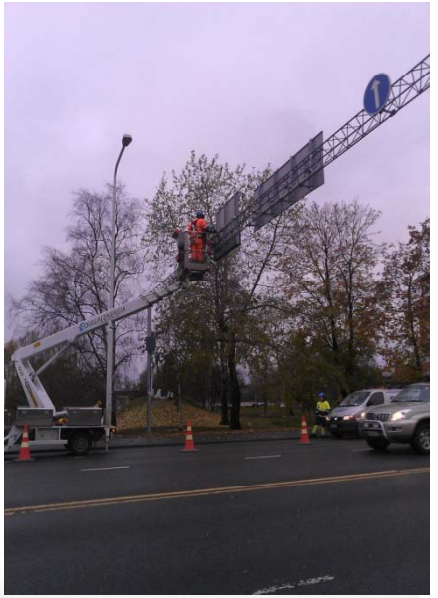
- Rich data from urban environment, from City of Oulu
- Data is collected from loop detectors at crossings, laser range sensors from one crossing, Bluetooth access points, DigiTraffic, taxis, and in-vehicle devices gathering engine data. Also weather data is collected.
- This data set enables the development of novel data analysis methods and building services that utilize these methods
- For example, more detailed (origin, destination) matrix and traffic flow models can be produced; such information is valuable for numerous services from real-time control to infrastructure development
- Companies can utilize this data collection setup and public access to real time traffic data in demonstrating and marketing their innovations and creating interest for new business









Towards exchanging and using research data

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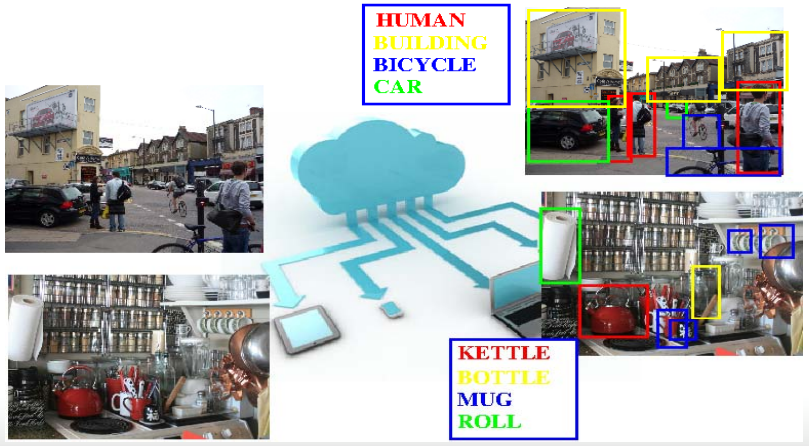
- Program-wide utilization of the FORGE Service lab
- VisualLabel: Open source platform for intelligent search of image and video data based on automatic content analysis
  - Storing and exploring billions of images and millions of hours of video is now economically viable.
  - All the main players in this area are in currently the North America (Google, IBM, Amazon, Microsoft, Facebook, etc.)
  - How can Finnish companies and Universities still compete?
    - Leverage on Finnish high quality expertise on data analysis
    - Main players develop proprietary systems, VisualLabel will be an open source platform
    - Companies dealing with visual data: F-Secure, Nokia, PacketVideo, …
- Future steps:
  - TextualLabel
  - Open challenges
  - Data repository
  - Algorithm repository



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