profium
makes sense

Applying data - case agriculture

Environmental Data for Applications Seminar

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Agenda

1. Basic company information
2. Vision
3. Simple use cases
4. Context-aware services
5. Agricultural use case / Viljavahti
6. Conclusions

Basic company information

- Y2014 turnover was 2,8meur, AAA –ranked
- 18 employees
- Flagship product is Profium Sense™ Platform including four application areas
  - Profium Sense includes very high performance inference engine
- Markets presently served: news/media, public safety, government
- Customers include AFP (global news agency) and multiple public organizations & enterprises
- Patent granted for inference technology

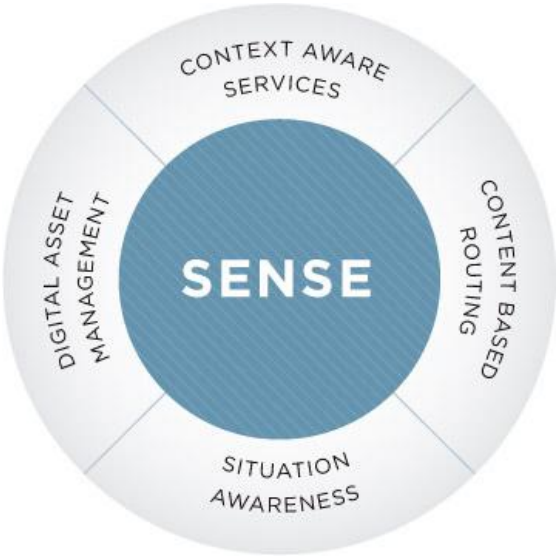
Espoo, Finland (HQ)

Mikkeli, Finland

Walnut Creek, CA, USA (Sales)

Vision for MMEA research work

- An increasing amount of environmental information is available but users have less time looking for relevant information.
- Digital services should become more intelligent and make relevant information available for users at the right place at the right time.
- Context-aware services are the next generation of digital services which map the digital environmental information to users' daily context.



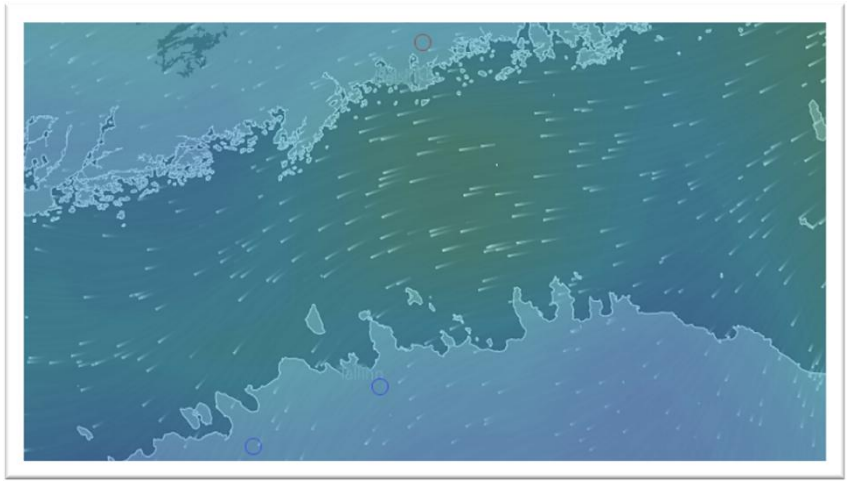
A simple use case

- Before we enter more complex scenarios, let’s start with a simple one:

- ”A15 knot wind in the Baltic sea *is ideal* for a sail boat”
- ”A 15 knot wind in the Baltic sea *is not ideal* for a small motor boat”

- Important consideration:
  context-aware service can make positive and/or negative information available for users.

- Important assumption:
  the above service needs to know what type of a boat the user has and where the boat is located.



Modeling user context

- The user domain can be modelled to the finest detail if need be but the downside is the effort required by the user to populate the model.
  - User model consists of facts which are true in the domain at a given time
- Two approaches to modeling the user context (not mutually exclusive):
  - Explicit where the user controls the model with a dedicated user interface (e.g. to set the type of his/her boat and its location)
  - Implicit where the user model is constructed from user behavior or mobile phone location or some other source than user's explicit modeling effort
- Once the context is established, a digital service can start its work...

Context-aware services

- Let’s take Google Now as an example:
  - You’re supposed to fly out of SFO in 2 hours and the service notifies that ”given the traffic for driving to SFO with your own car, you should hit the road in 10 minutes from where you are right now”.
  - Nice implicit profile construction from calendar and current location.

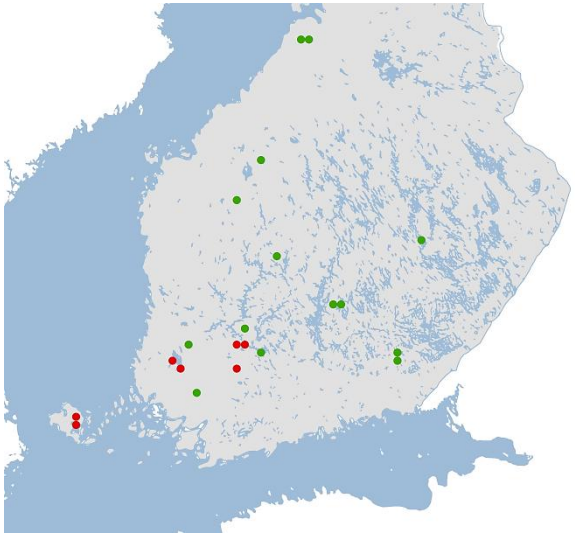
- Let’s take a prior ICT SHOK project (Next Media) mediatutka application as an example
  - You’re cycling in Espoo and when you get closer than 2 kilometers from Tapiola library, you will receive a notification about a French movie available for lending which you can go pick up on your way home.
  - Combination of an explicit semantic interest profile and implicit profile that is your current location in Espoo.

Agricultural context-aware service ”Viljavahti”

- Farmers were identified as a target group who would benefit from timely and relevant notifications about pests and diseases.
  - Optimized use of any pesticides is of great economic interest
- The information to be notified for the farmers was generated by MTT (now LUKE).
- Previously MTT published reports on their Web site and assumed farmers to be active in looking for relevant information for them
  - Relevancy defined as pests and diseases which would impact their crop where they grow it.

Farmer’s profile construction

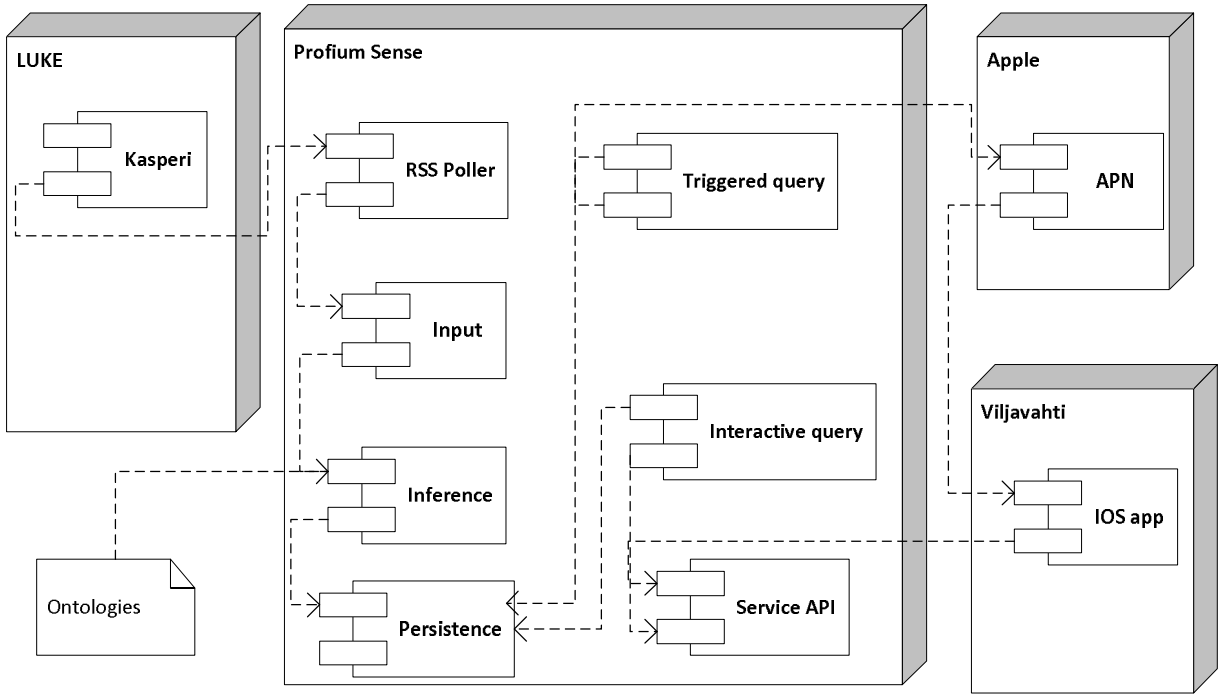
- The explicit profile construction involved selecting the type of the crop and its location in Finland.
  - One farmer is able to define several such profiles as they may grow different crop in different areas.
- Once configured, the app (Viljavahti) became the assistant who would inform the farmer only in case there was a threat to their crop in the area where they grow it.



Other supported use cases

- The app supported also feedback from the farmers to the experts at MTT (now LUKE).
- This feature allows either identified or non-identifier observations to be easily sent from the crop fields and alerts could be distributed via LUKE to other farmers who might need to deal with the pests and/or diseases in their area.
  - The trials were implemented with a moderated feedback loop i.e. the observations were not immediately distributed to neighboring farmers (even though the technology supports this).

How was it all done?



Conclusions

- Context-aware services provide benefits over traditional digital services
  - User model drives a proactive service interaction model.
  - Service intelligence can improve without requiring software updates by the end-user.

- Agricultural domain benefits
  - Ability to optimize use of farmers' time when to look for pests and diseases.
  - Ability to optimize use of pesticides.
  - Farmers can use observations to help decide whether to start proactive measures against the pests or diseases.
  - Farmer observations complement systematic, regular monitoring.