# Service Design Workshop

## Mobile Web Services

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du Canton de Vaud


Koubachi
Buy
Learn
Help
Search...
Login
Koubachi analyzes your data
and gives you detailed care instructions
when and how to care for your plants.
2
PCE
Koubachi Plant Care Engine
3
1
Sensor
Apps
Measure
Analyze
Display
1
2
3

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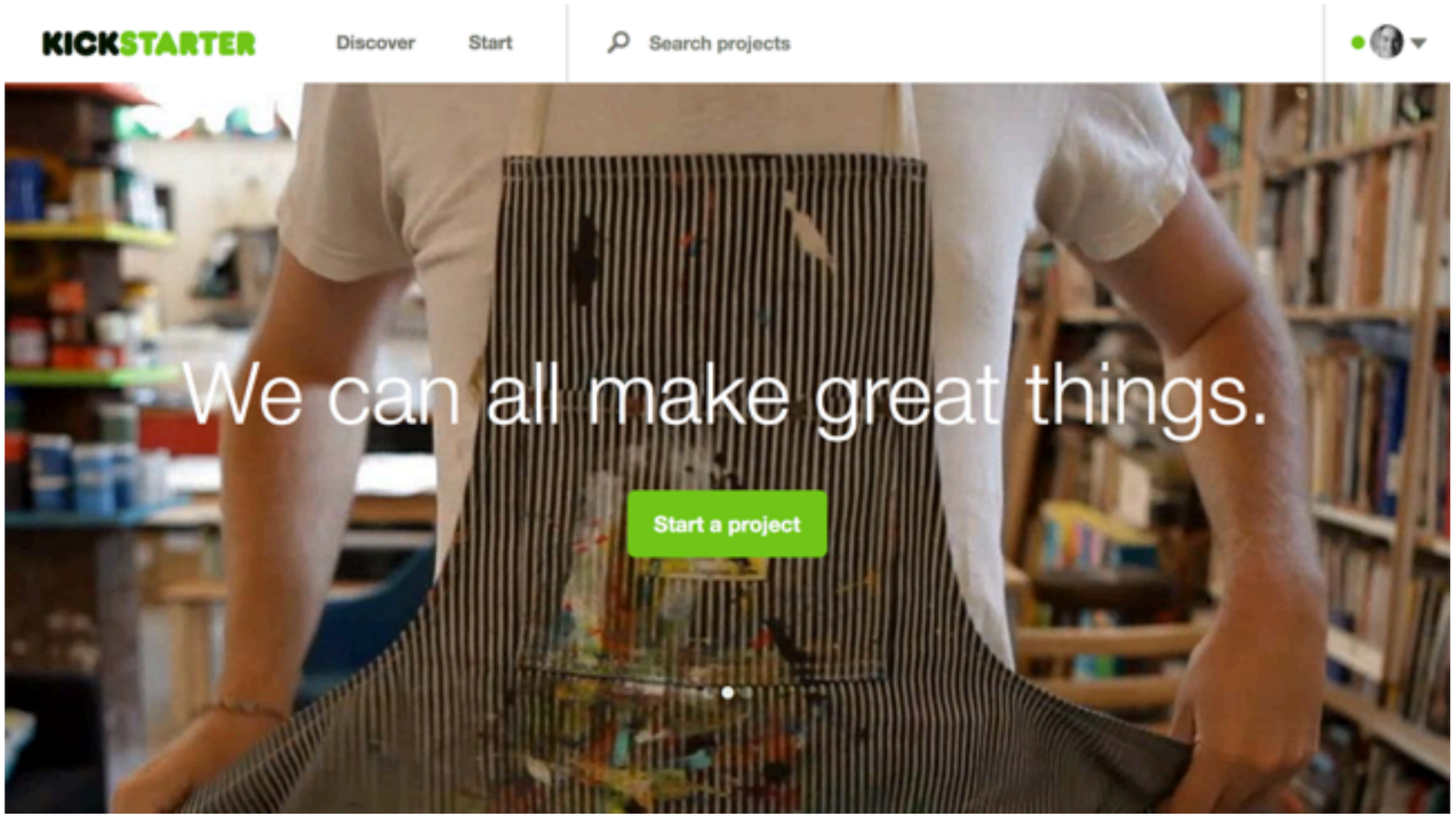


**Imagine** and **describe** a **service** that would combine a **mobile app** and some kind of **sensor(s)** for the benefit of a **particular user group**.

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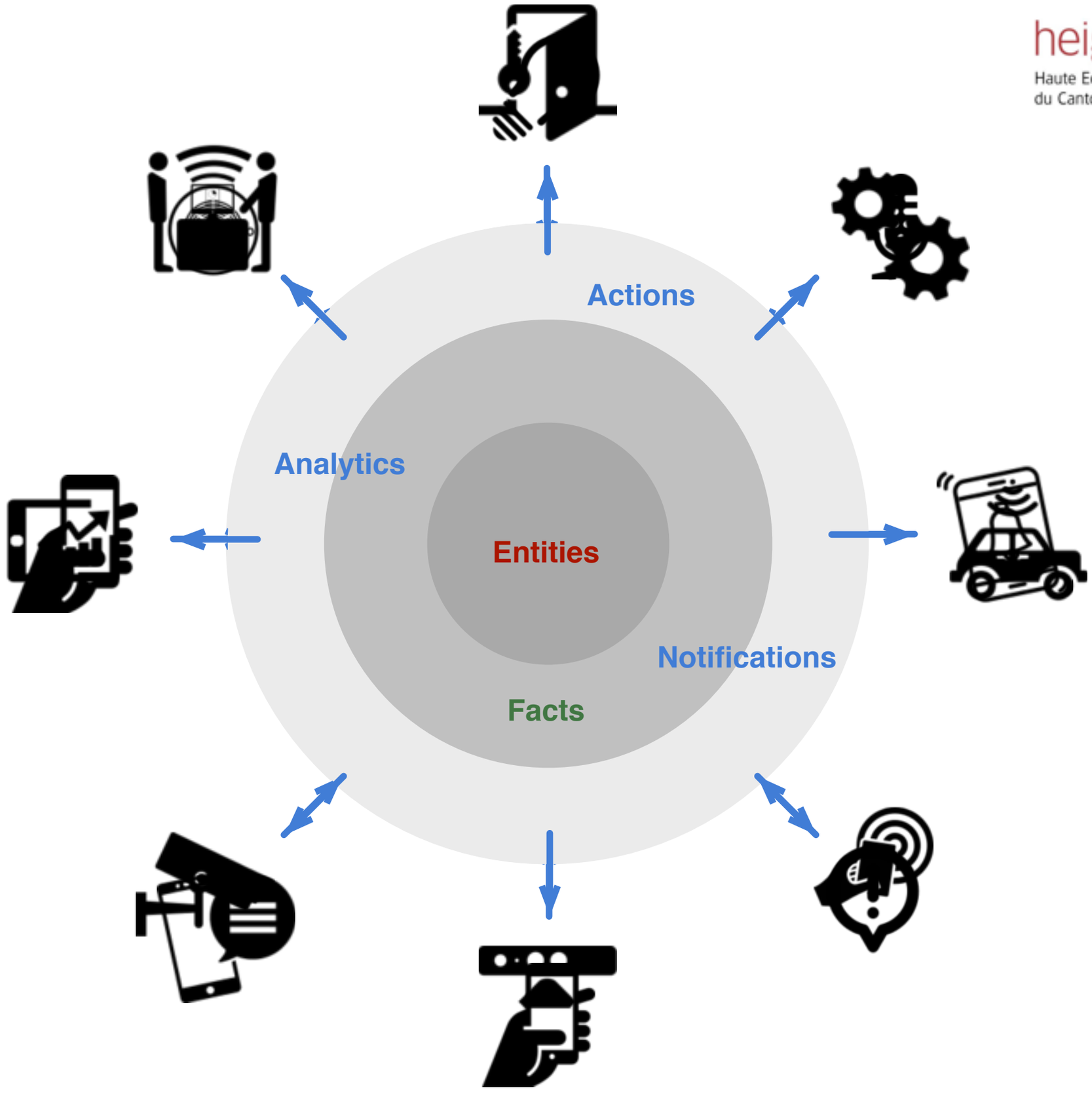

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"In my **application domain**, there are ***Entities***: plants, bikes, locations, users, buildings, activities, objects, etc."

"By **interpreting** streams of events, I can infer ***Facts*** about domain entities."

"**Sensors** report **streams of *Observations*** about what they see (in the physical or in the digital world)."

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Knowledge

**Entities**

Locations: Kitchen, Living Room, Basement
People: John, Sarah, Bob, Alice
Meetings: meeting1, meeting2, meeting3

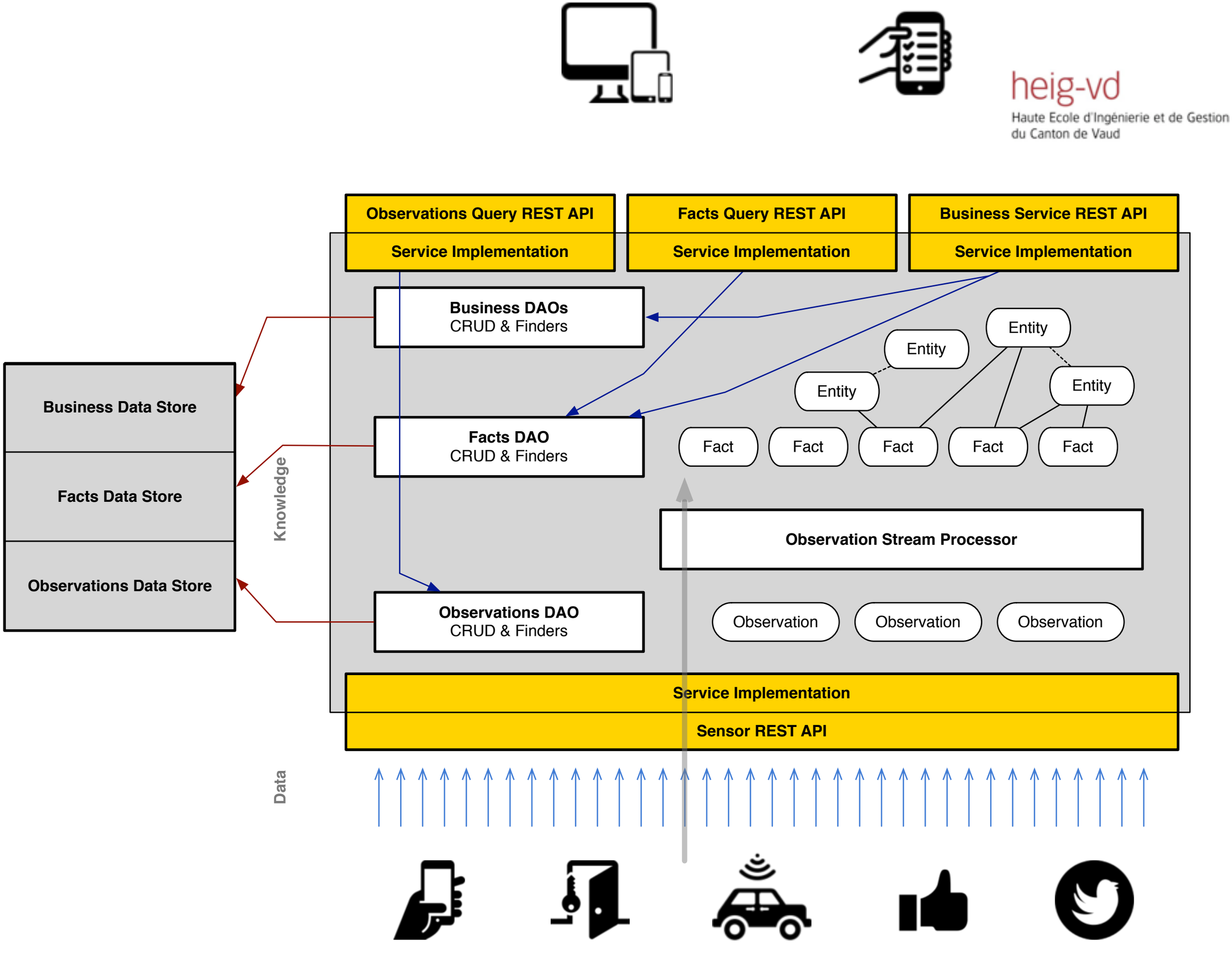
**Facts**

"The last know temperature in the kitchen is of 12.2 degrees (at 12:05:00)"
"The warmest temperature in the kitchen during the last 24 hours is 23.2 d"
"John has been in the elevator at 12:20:00"
"John has been in 5 locations during the last 2 hours"
"John and Sarah have been in three meetings together over last week"

Data

**Observations**

"sensor A2 has measured a temperature of 12.3 degrees at 12:02:00"
"sensor A2 has measured a temperature of 12.2 degrees at 12:05:00"
"sensor A3 has measured a temperature of 12.8 degrees at 12:05:00"
"sensor B8 has seen tag 87KHE8 appear at 12:20:00"
"sensor B8 has seen tag 82UU28 disappear at 12:20:00"
"sensor C6 has sensed a new location at 46°47'25.2"N 6°31'22.1"E"

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**BusinessService REST API**

GET /locations/{id}/periods?filter=warmest
GET /periods/{id}/locations?filter=cool

**BusinessService**

Location findWarmestPeriodForLocation(Location loc)
List<Location> findCoolSummerPlaces()
List<Location> findHotWinterPlaces()

**Configuration REST API**

GET /locations/
GET /locations/{id}
POST /locations
PUT /locations/{id}
DELETE /locations/{id}

GET /periods/
GET /periods/{id}
POST /periods
PUT /periods/{id}
DELETE /periods/{id}

**LocationsDAO**

List<Location> findAll()
Location findLocationById()
void createLocation()
void updateLocation()
void deleteLocation()

**PeriodsDAO**

List<Location> findAll()
Period findPeriodById()
void createPeriod()
void updatePeriod()
void deletePeriod()

**Location**

String name
double latitude
double longitude
double radius

boolean isInLocation(double lat, double lon)

**Period**

long startTime
long endTime

**HighestTemperatureFact**

double temperature

**FactsDAO**

HighestTemperatureFact findFactsByLocation()
HighestTemperatureFact findFactsByPeriod()
createOrUpdateFact(long lat, long lon, long ts, double temperature)

**ObservationsDAO**

List<Observation> findAll()
Location findObservationById()
void createObservation(Observation o)

**TemperatureObservation**

double latitude
double longitude
long timestamp
double temperature

**StreamProcessor**

onObservation(TemperatureObservation o);

**Sensor REST API**

POST /observations/
POST /observations/

**Location**

String name
double latitude
double longitude
double radius

boolean isInLocation(double lat, double lon)

**Period**

long startTime
long endTime

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boolean isInLocation(double lat, double lon)

**Period**

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long endTime

**HighestTemperatureFact**

double temperature

# Design Task: **Service Concept**

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***Who*** *are your users?*

***What*** *problem are you solving for them?*

***How*** *do you plan on solving it?*

***How*** *will users interact with your service (sensors, objects, app, etc.)?*


http://www.brunowong.me/portfolio/music-dojo-web-page-mobile-app/

# Design Task: **Domain Model & Entities**

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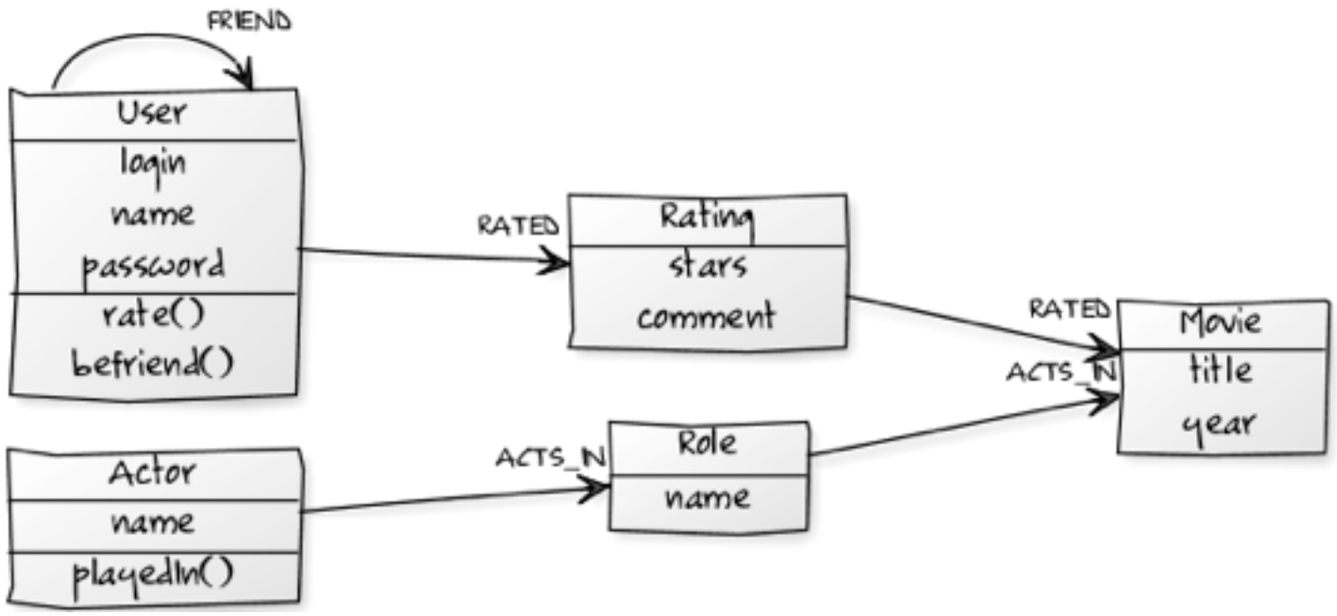
- What is your **application domain**?
- What are the **entities** in your application domains domain?
- What are their **properties** (attributes)?
- What are the **relationships** (composition, aggregation, inheritance) between these entities?




http://docs.spring.io/spring-data/data-neo4j/docs/3.0.1.RELEASE/reference/html/tutorial_domain.html

# Design Task: **Sensors**

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- What **types of sensors** do you plan to use for your service?
- Are they measuring something in the **physical** or in the **digital** world?
- **What** do they measure or detect?
- At which **frequency** do they take and report observations?
- What will you do if you want to **simulate** or implement these sensors?

**sensor** | ˈsɛnsə |

noun
a device which detects or measures a physical property and records, indicates, or otherwise responds to it.

ORIGIN 1950s: from SENSORY, on the pattern of *motor* .

# Design Task: **Facts**

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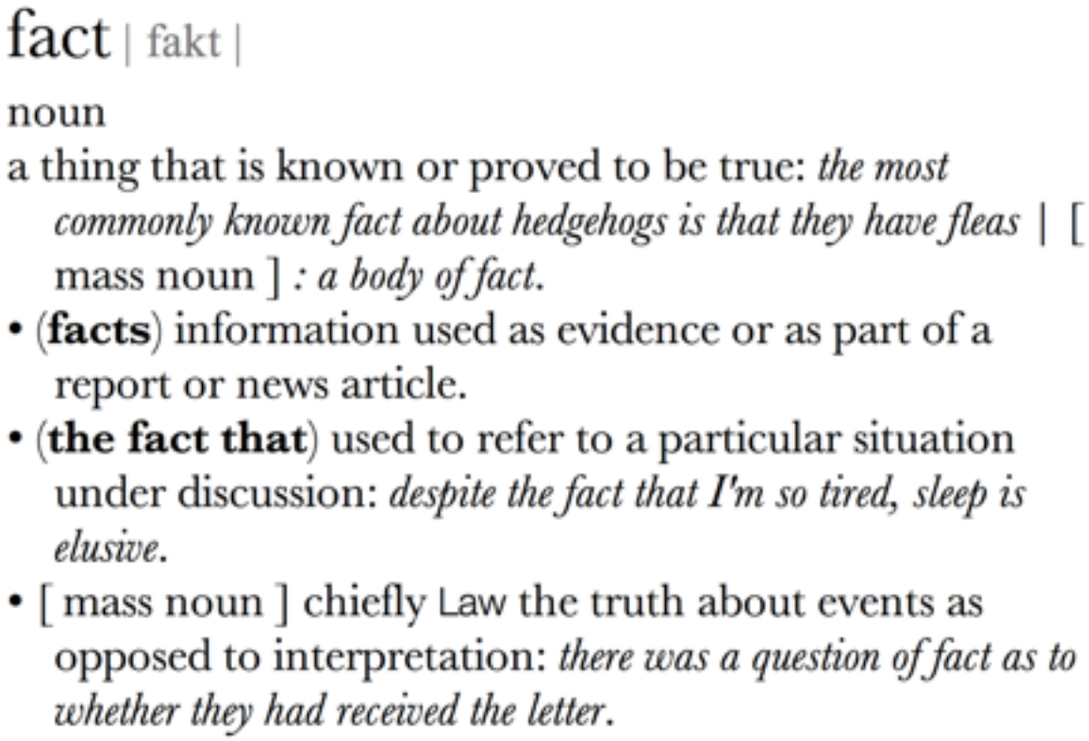
- What **types of facts** about your entities do you need to capture, in order to deliver features to your users?
- For every type of fact, what are the **attributes** and what are the **relationships with entities**? (e.g. a `LastKnowPositionFact` might link a `Person` entity and a `Location` entity and have a timestamp attribute)



fact | fakt |

noun

a thing that is known or proved to be true: *the most commonly known fact about hedgehogs is that they have fleas* | [ mass noun ] *: a body of fact.*

- (**facts**) information used as evidence or as part of a report or news article.
- (**the fact that**) used to refer to a particular situation under discussion: *despite the fact that I'm so tired, sleep is elusive.*
- [ mass noun ] chiefly Law the truth about events as opposed to interpretation: *there was a question of fact as to whether they had received the letter.*