Introduction to Data Exploration

Data Processing vs. Querying vs. Exploration

Objectives

Objective

Explain why we need
data exploration

We are living in a data-rich world…

rehabilitation

energy

security

training

smart-offices

production

life-sciences

defense

smart-rooms

sports

elderly-care

robotics

retail

child-care

supply-chain

personal-data management

entertainment

arts

education

pet care

space exploration

advertisement

sciences

business/enterprise

How can we make SENSE from the REAL WORLD data

"Sense" making…What Does it Mean?

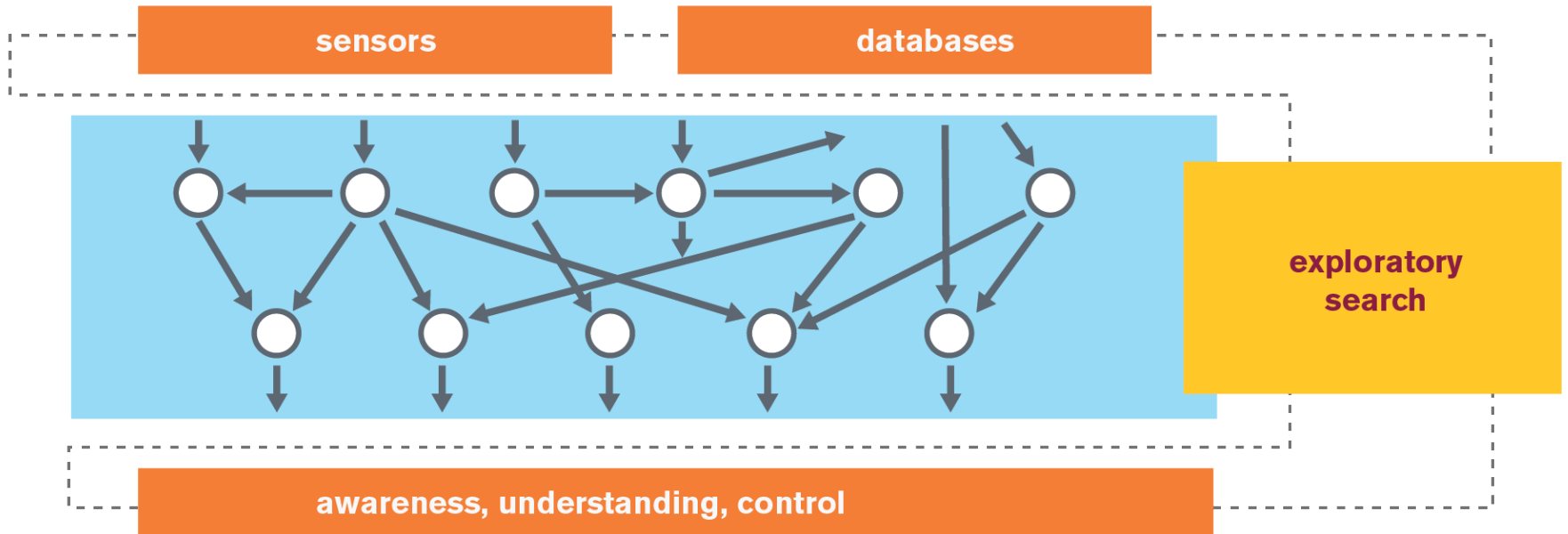**1st sense: from latin "sentire" or "to perceive"**

- Any of the faculties, as sight, hearing, smell, taste, or touch, by which humans and animals **perceive stimuli** originating from outside or inside the body

2nd sense: to attain awareness or understanding of…"

- "**awareness**" implies vigilance in observing or alertness in drawing interferences from what one experiences

- "**understanding**" is the power to make experience intelligible by applying concepts and categories

Did You Notice the Gap?

…there is a **gap** between the first meaning (**feel**, **measurement**) and the second (**awareness**, **understanding**)

Data Processing vs. Querying vs. Exploration

Querying

- User knows what she wants

- User can describe what she wants

Data Processing

- User knows what she wants

- User has a function/procedure /workflow to compute what she wants

Navigation

- User knows what he wants

- User does not know how to describe/locate what she wants

Exploration

- User **does not precisely know** what she wants

- User wants to get an idea about the available data

Exploratory Search

Acquiring new knowledge and revealing new facts

- Analysis (identify common patterns or outliers)

- Comparison (quantify similarity/differences)

- Aggregation (create groups, clusters)

- Transformation (use a more convenient representation)

- Visualization