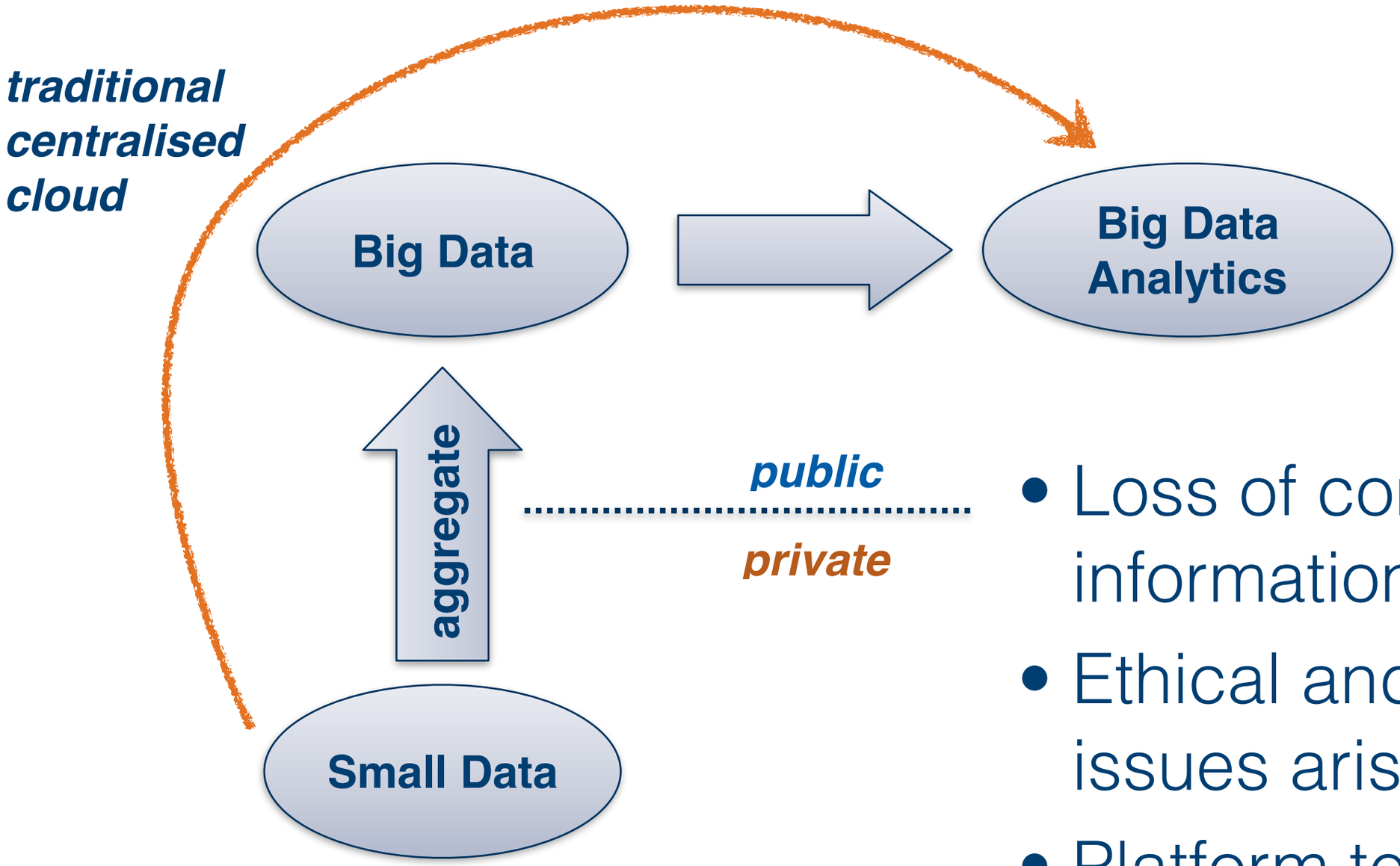
UNIVERSITY OF CAMBRIDGE

Databox Technical Architecture

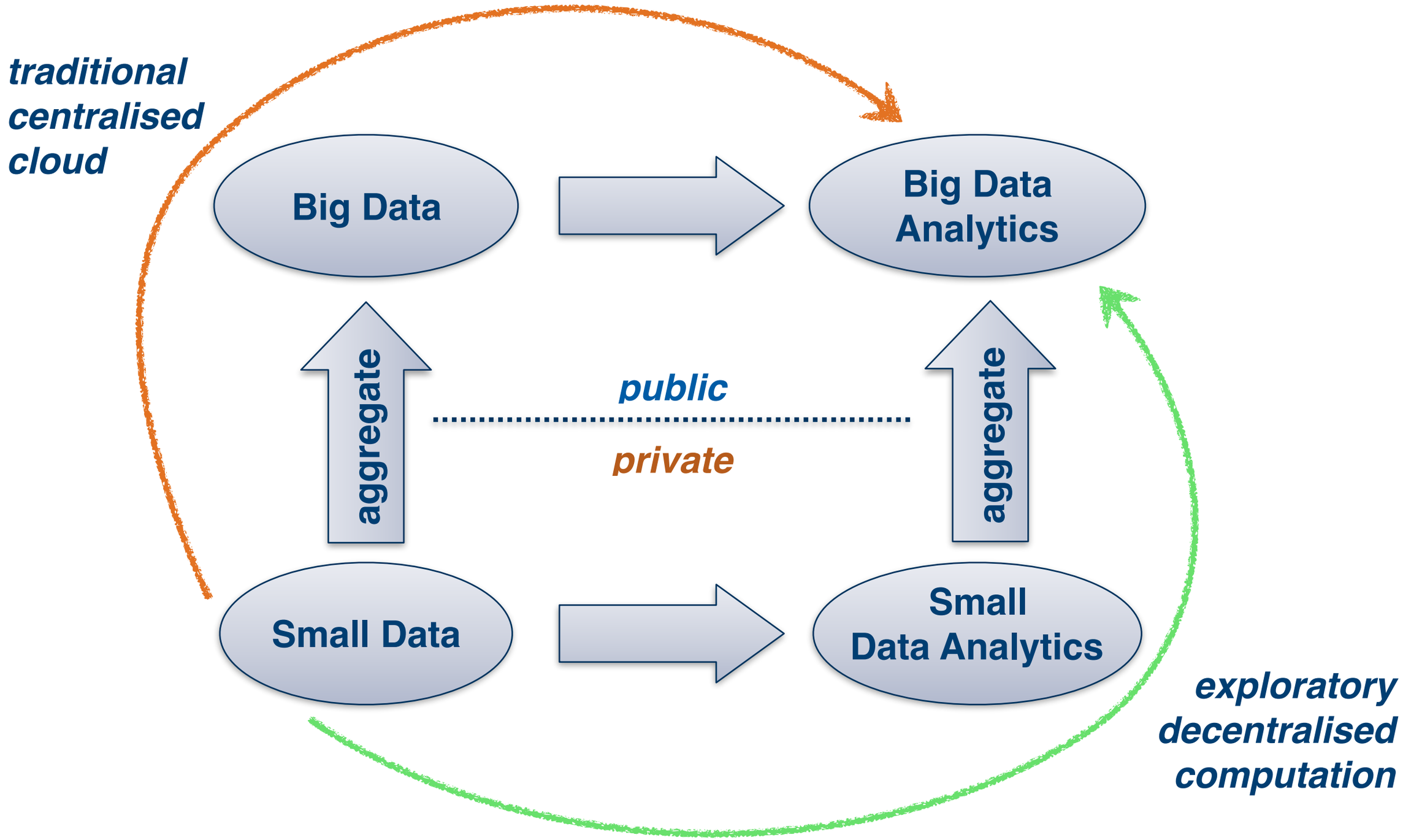
Networks & Operating Systems
SRG, Computer Laboratory

Big Data Analytics?



- Loss of contextual information
- Ethical and legal issues arise
- Platform technology challenges

Big Data Analytics? Small Data Analytics!

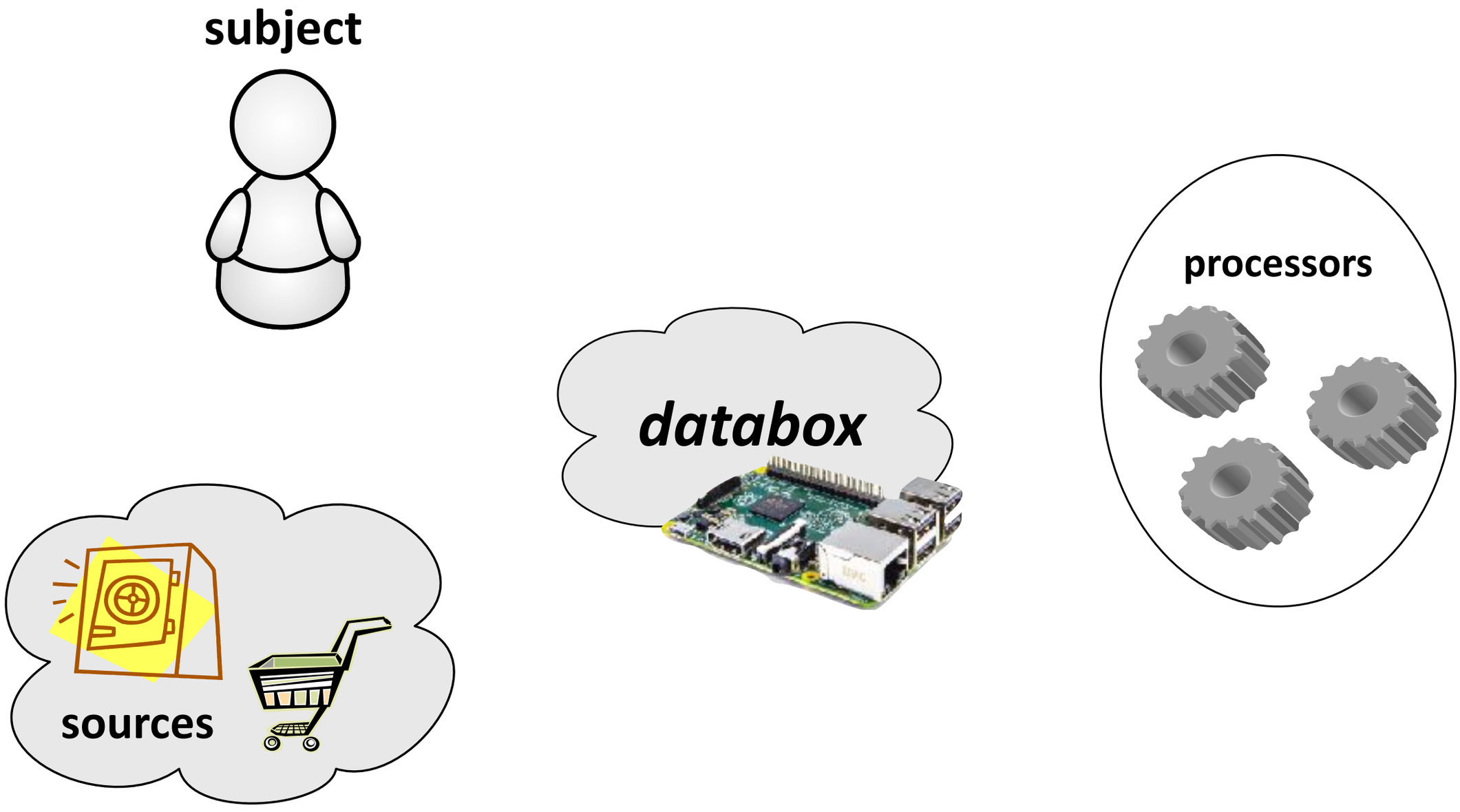


Moving Computation to Data

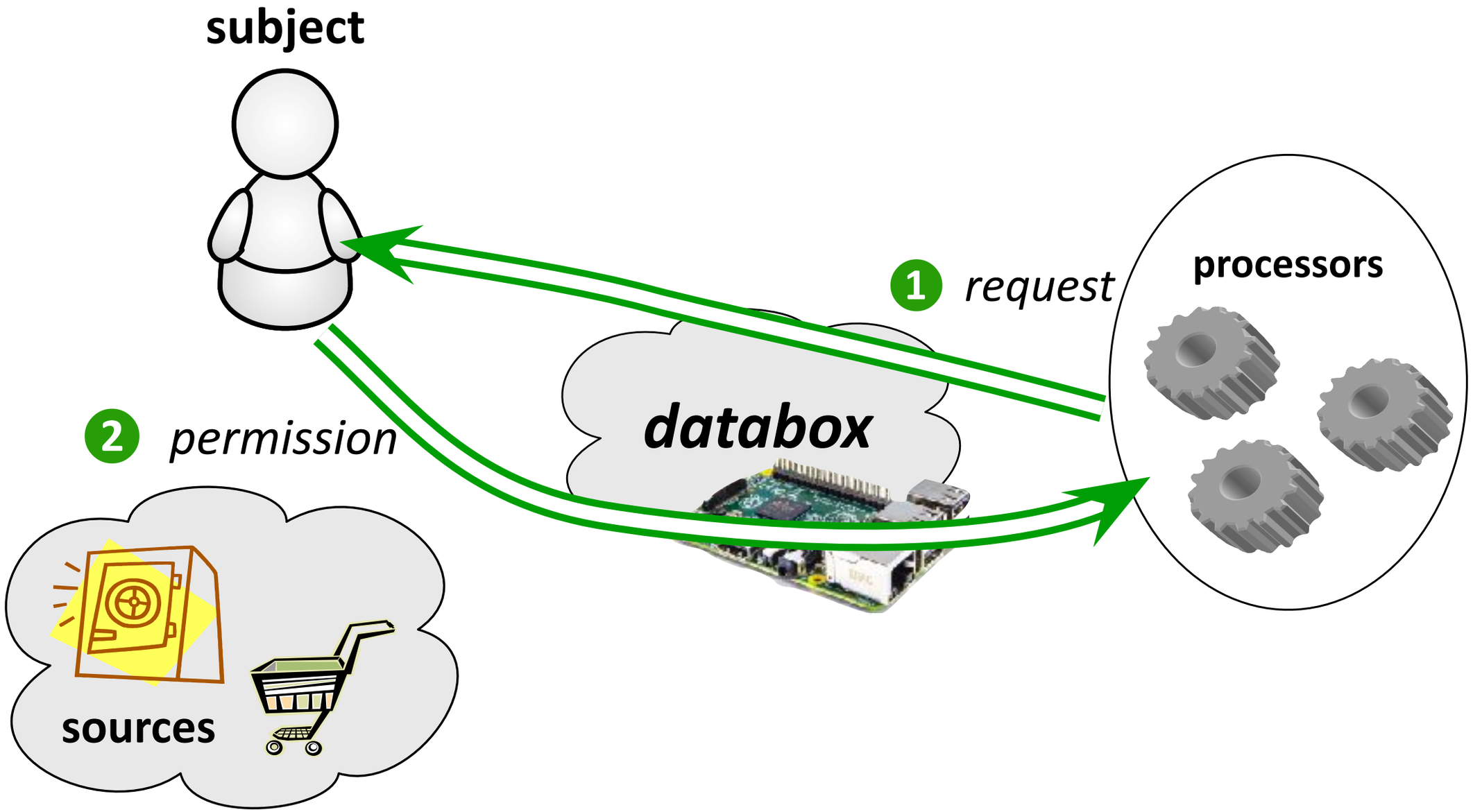
http://cliparts.co/honey-pot-clip-art

- Reduce honey pot effects
  - Don’t collate all users’ data in one place
- Process data locally
  - For privacy, efficiency, latency
  - Minimise data export
- For example,
  - Sentiment analysis based on all communications
  - Household occupancy via face detection on front-door video feed

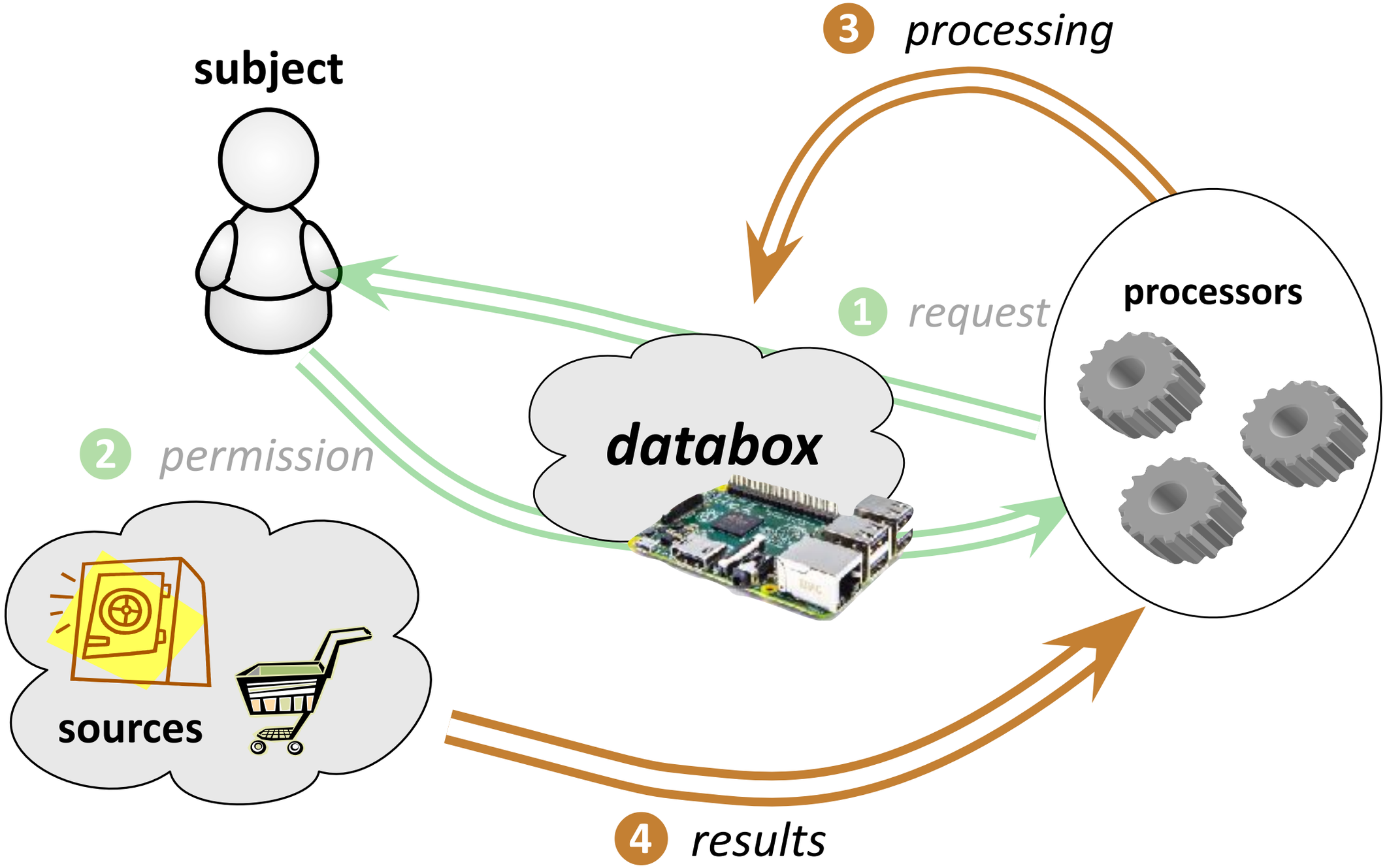
Databox: Implementing HDI



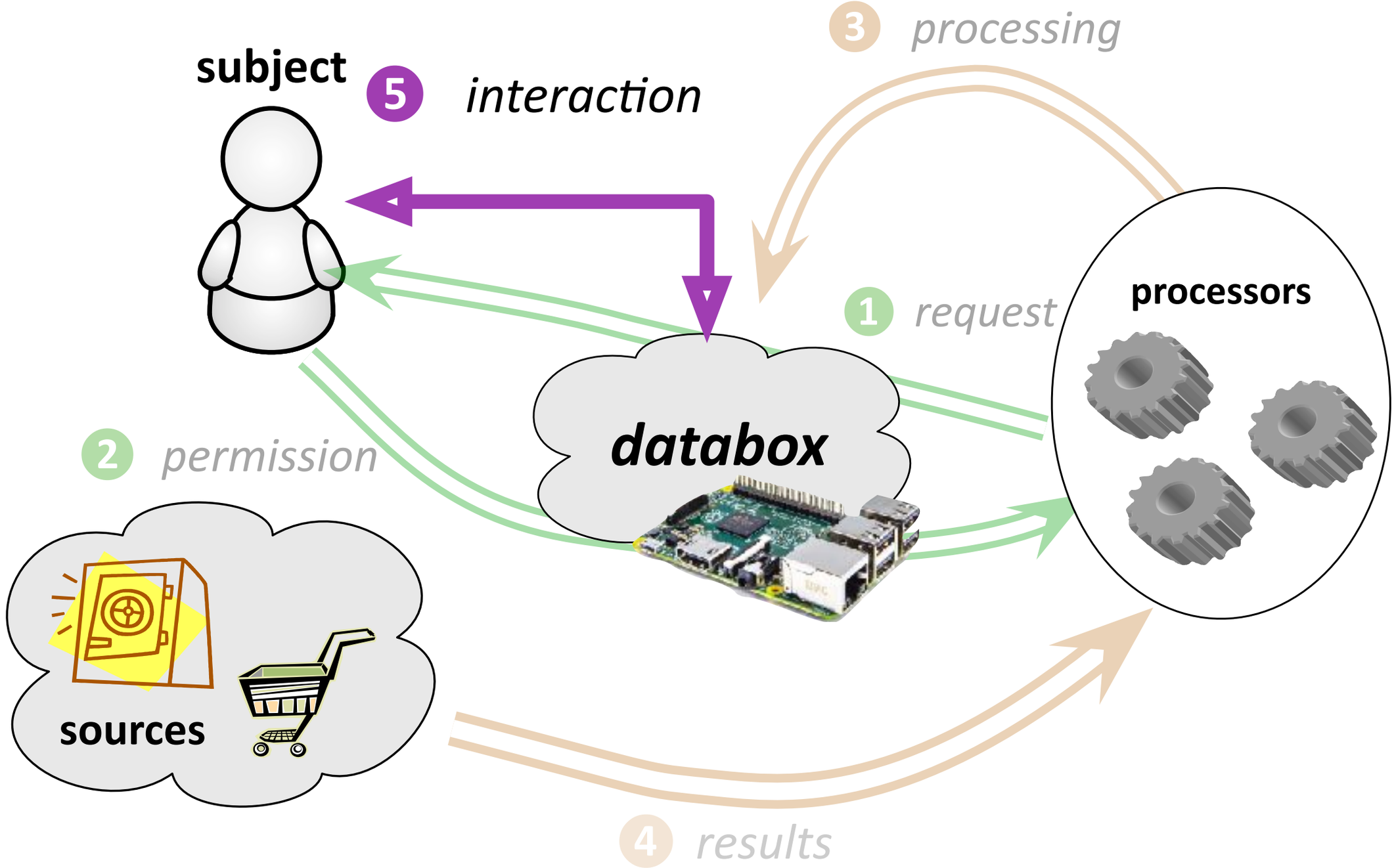
Databox: Providing Legibility



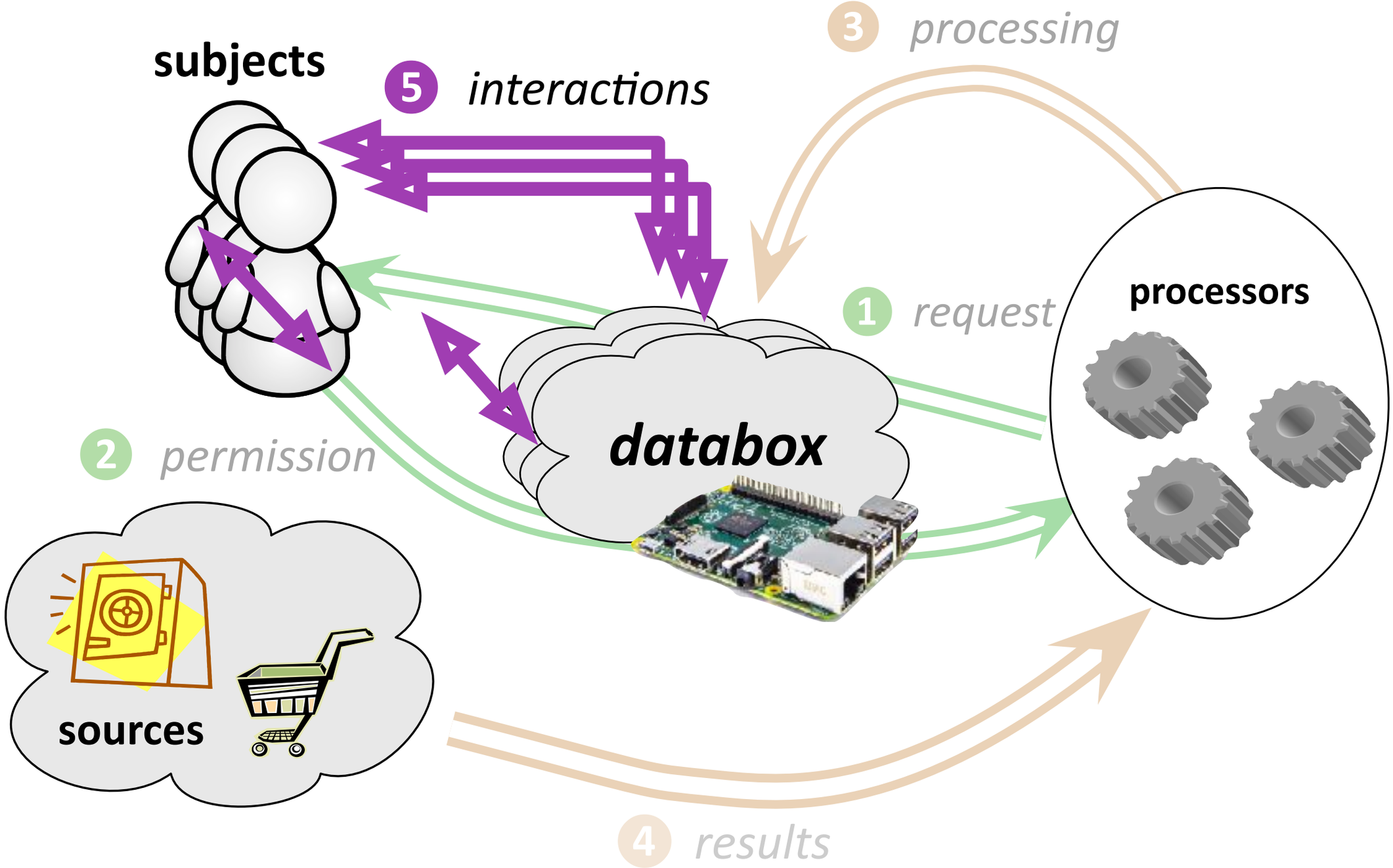
Databox: Providing Agency



Databox: Providing Negotiability



Databox: Providing Interactions



Design Principles

- Clear separation of components
  - Intercommunication via specifed APIs
  - Use of containers (unikernels, VMs…)
- Distinct data sources represented by distinct data stores
  - Breaking into one store doesn’t get all the data
- Components disconnected by default
  - Try to reduce attack surface
- All control and data flow logged for audit
  - Help users understand implications of actions
  - In case of breach, understand what happened

Databox Components