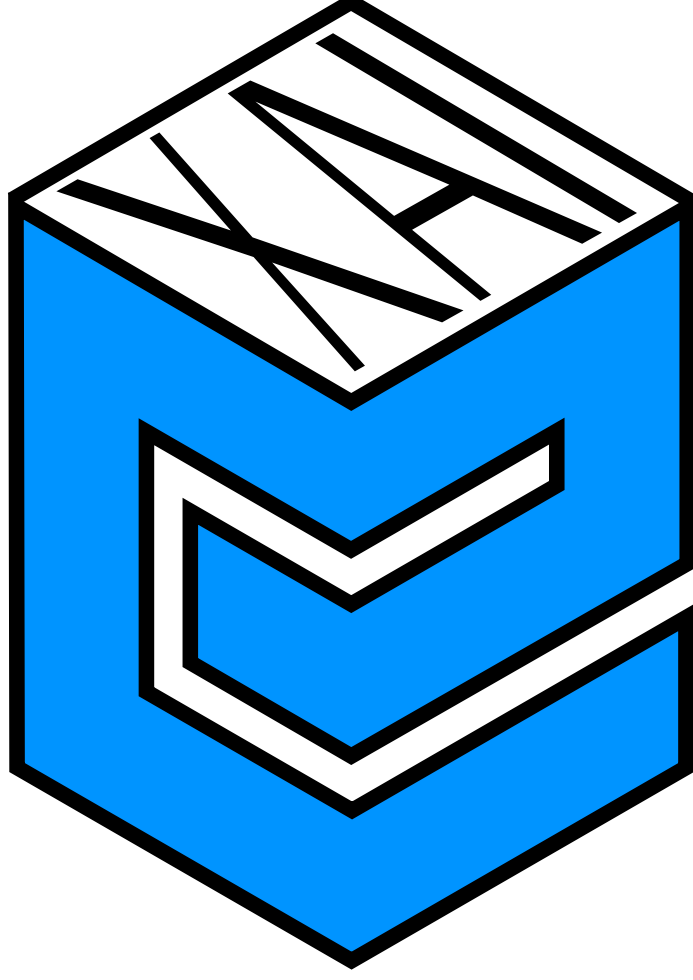
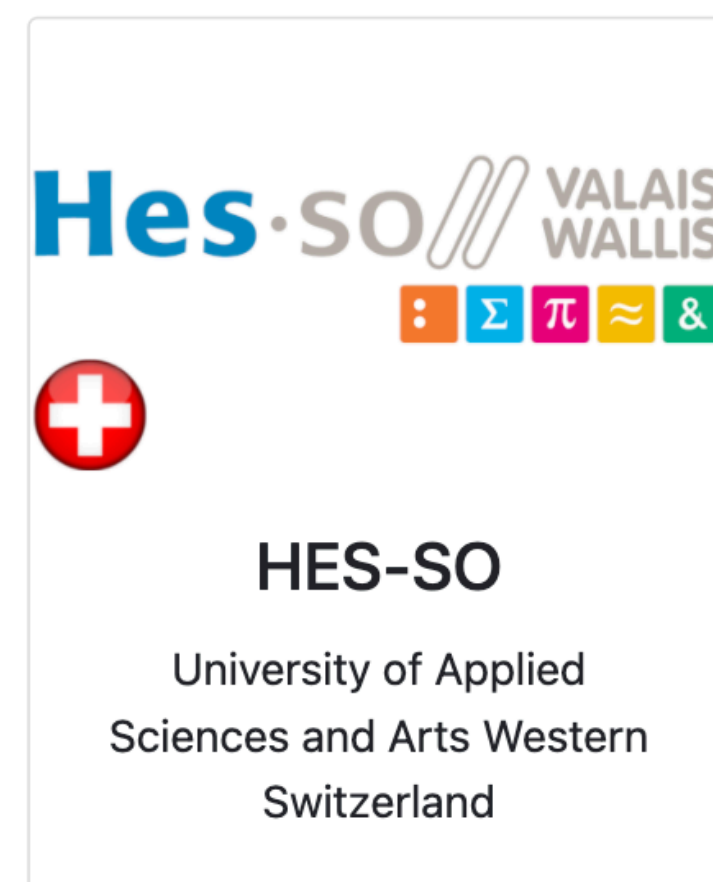




XPECTATION

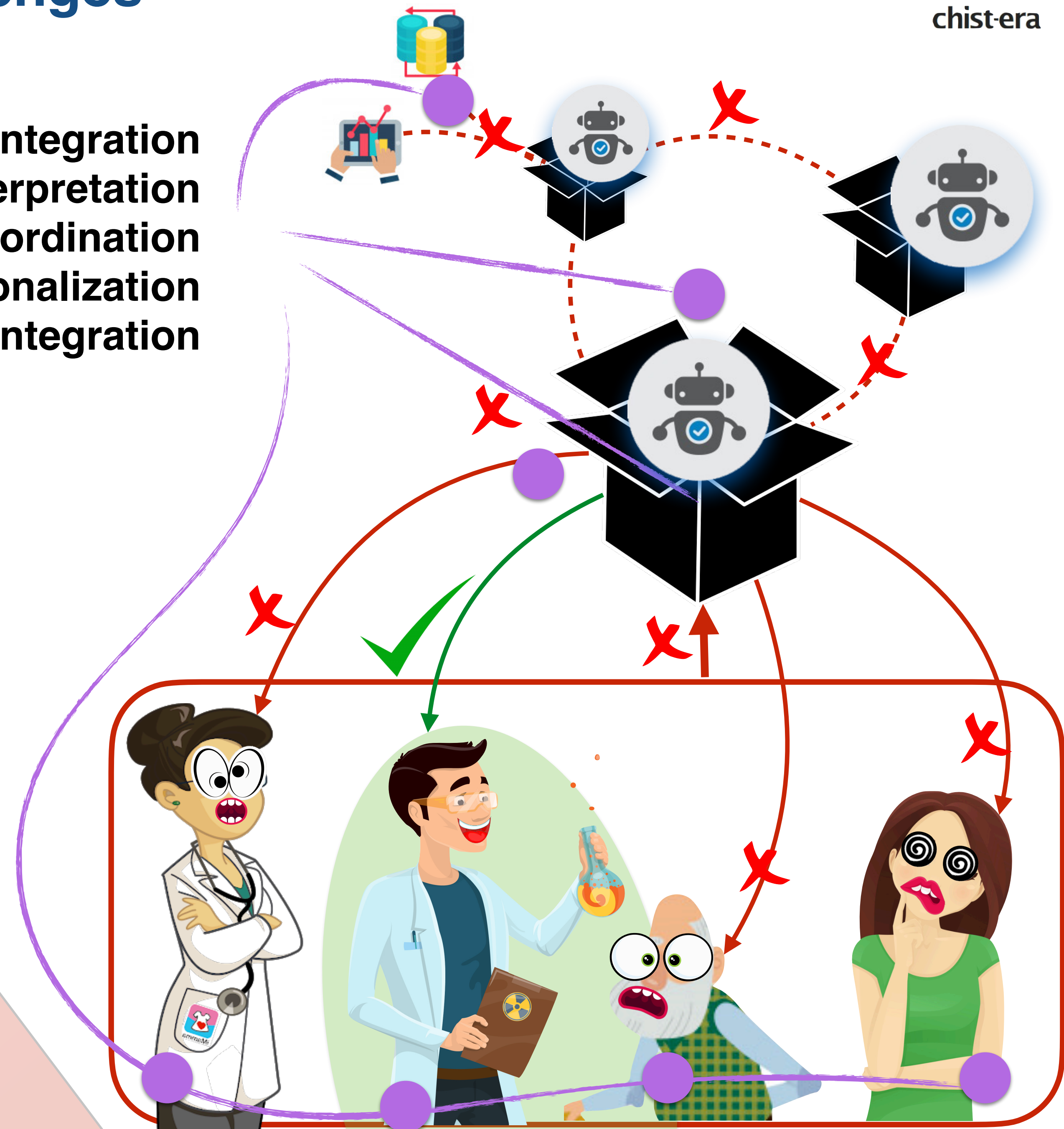
PERSONALIZED EXPLAINABLE ARTIFICIAL INTELLIGENCE FOR
DECENTRALIZED AGENTS WITH HETEROGENEOUS KNOWLEDGE

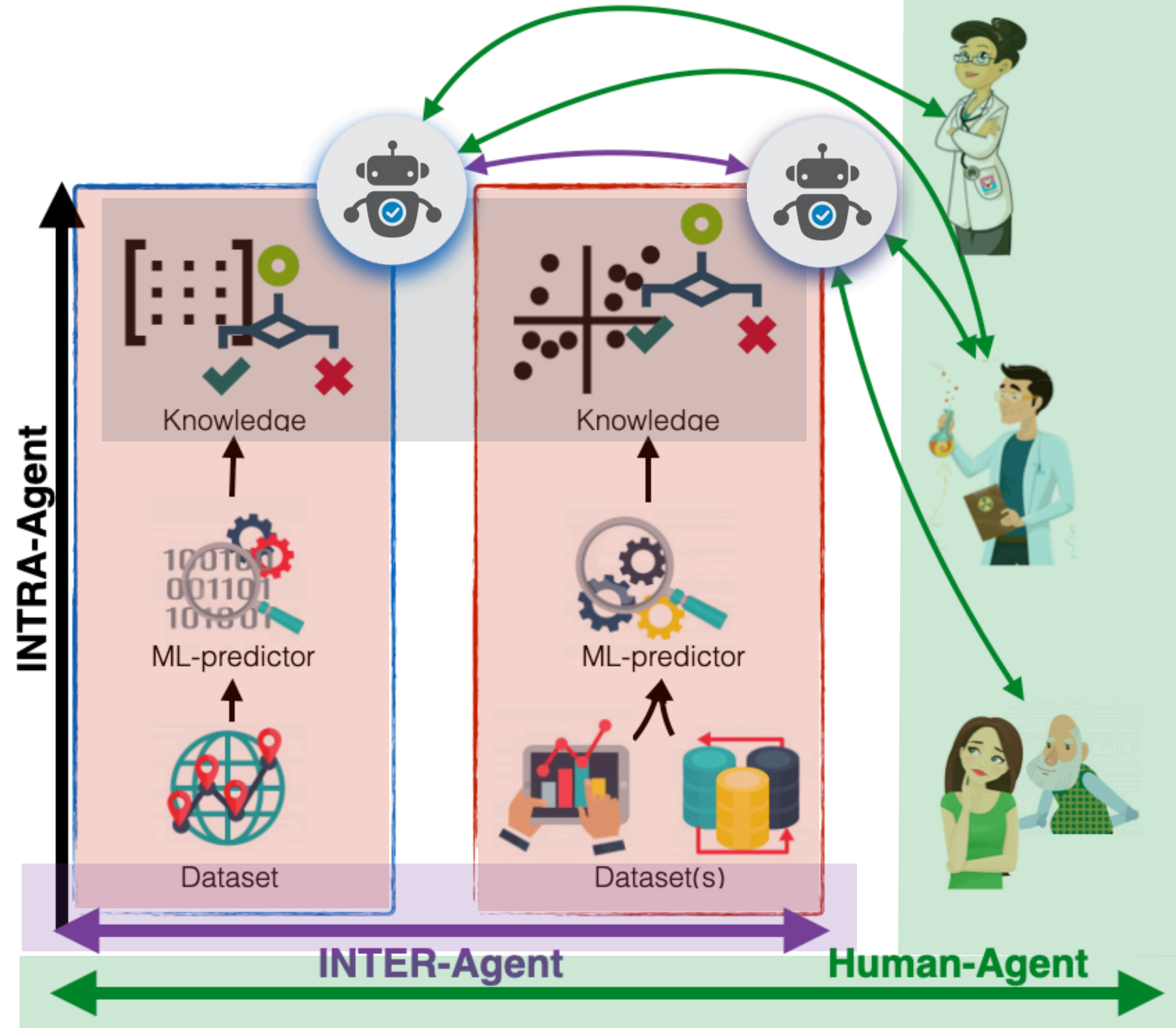


Challenges

Data Integration
Interpretation
Negotiation/Coordination
Personalization
Neuro-symbolic integration

No XAI










HES-SO
University of Applied
Sciences and Arts Western
Switzerland




UNIBO
Alma Mater Studiorum
Università di Bologna




UNILU
University of Luxembourg




OZU
Özyeğin University

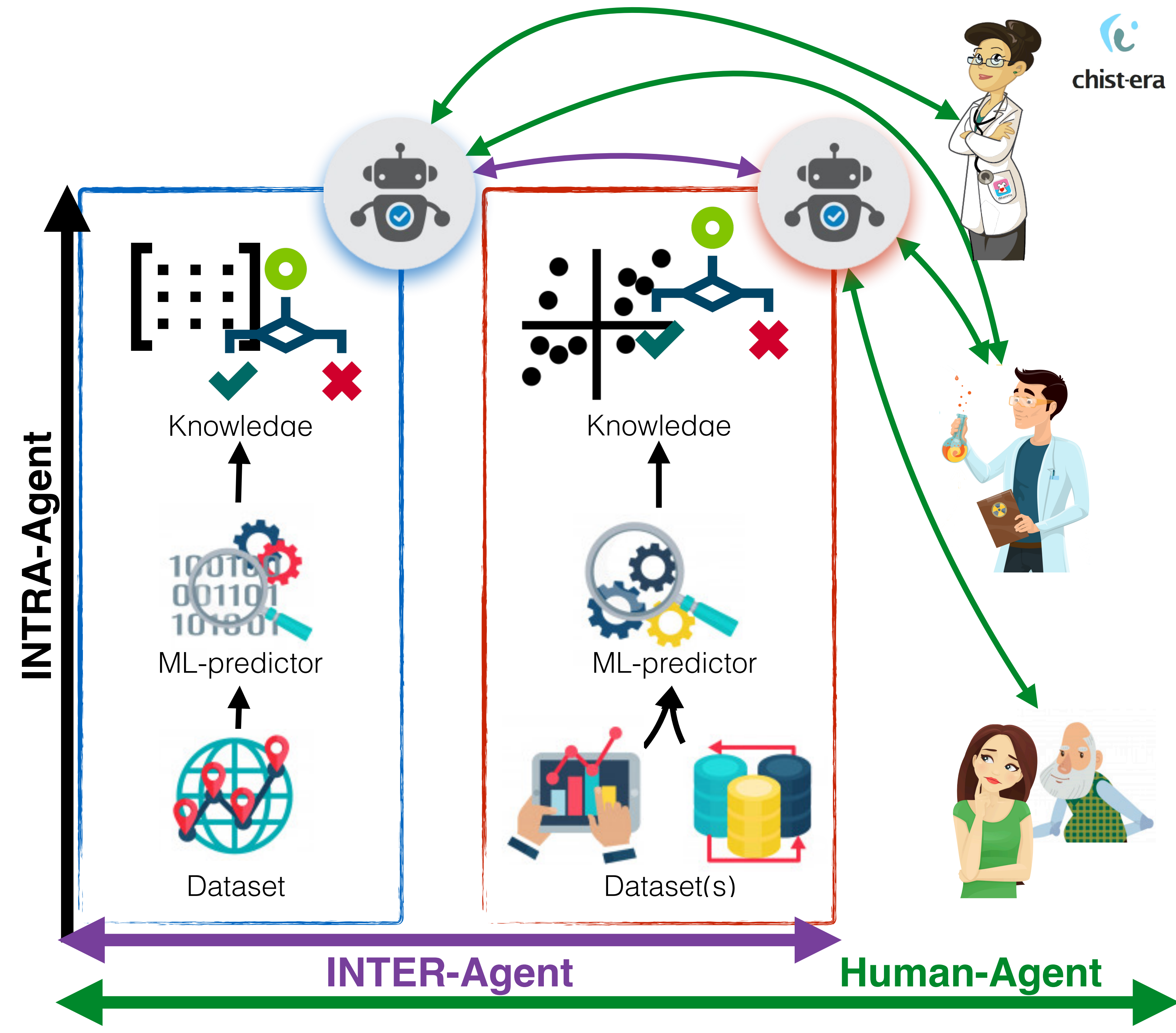
Impact

Theoretical outcomes

Mechanisms to **extract**, **combine**, **explain** and **negotiate** heterogeneous symbolic knowledge

Technological outcomes

Explainable-**by-design systems** can boost trust and transparency (imperative in many domains)
Widening the adoption of AI-based systems in the real-world



Impact

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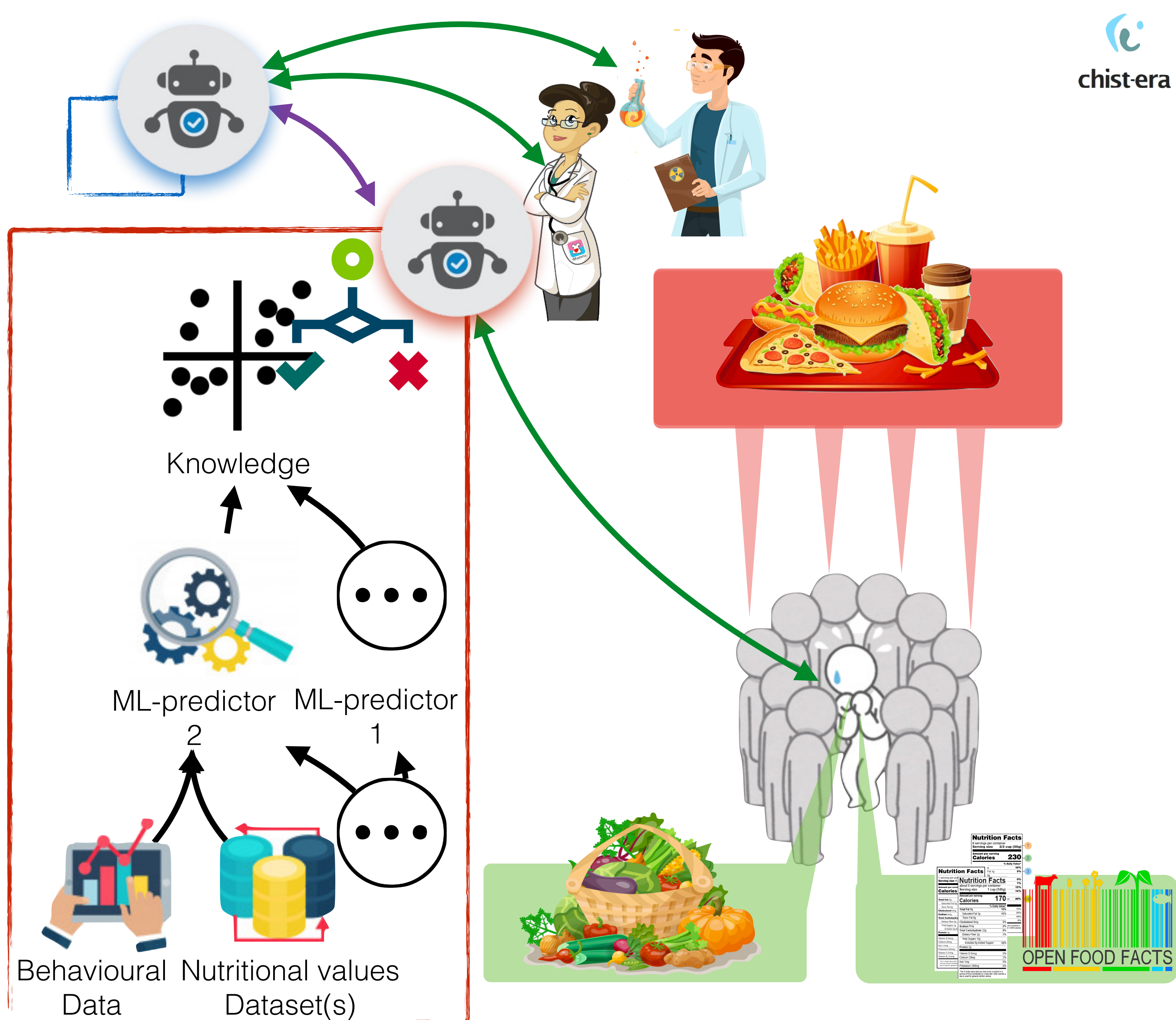
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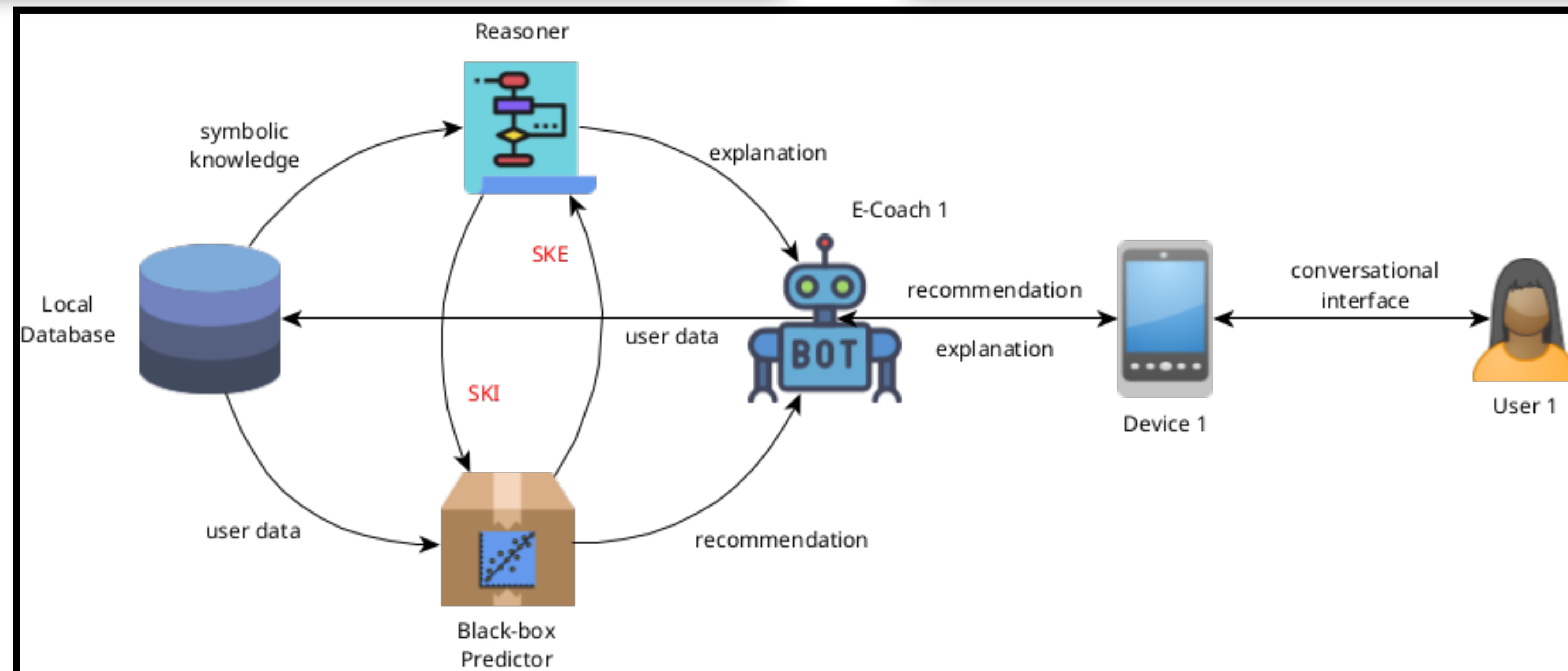
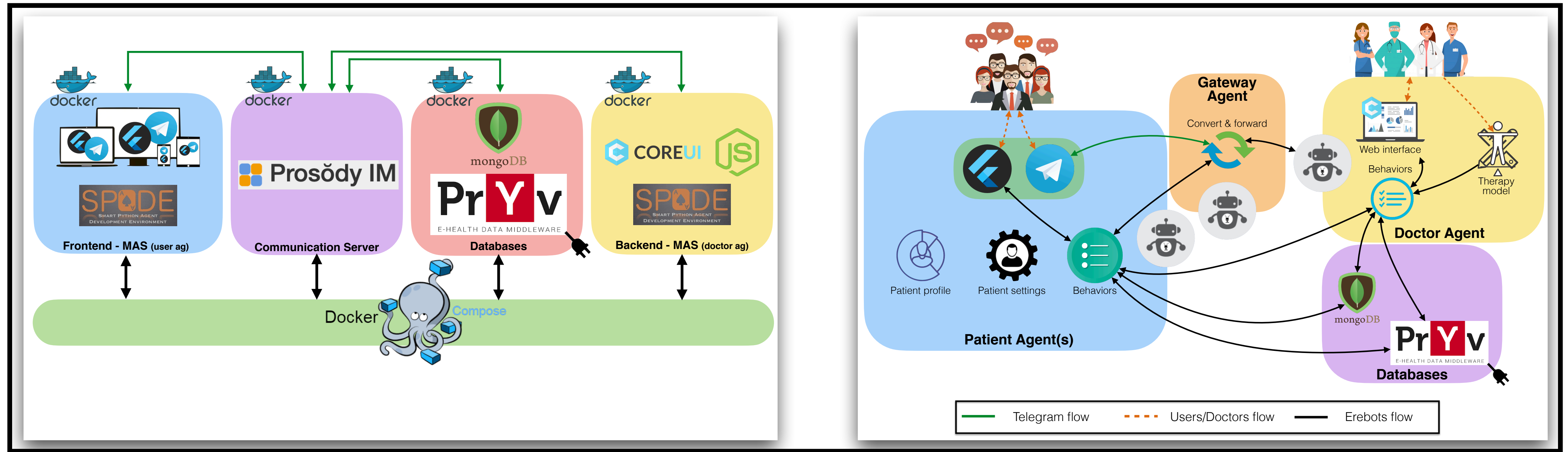
Application domain

Explain recommendation in **eHealth** and **wellbeing** application is strategical to boost Acceptance and understanding, henceforth therapy adherence

Ethical aspects

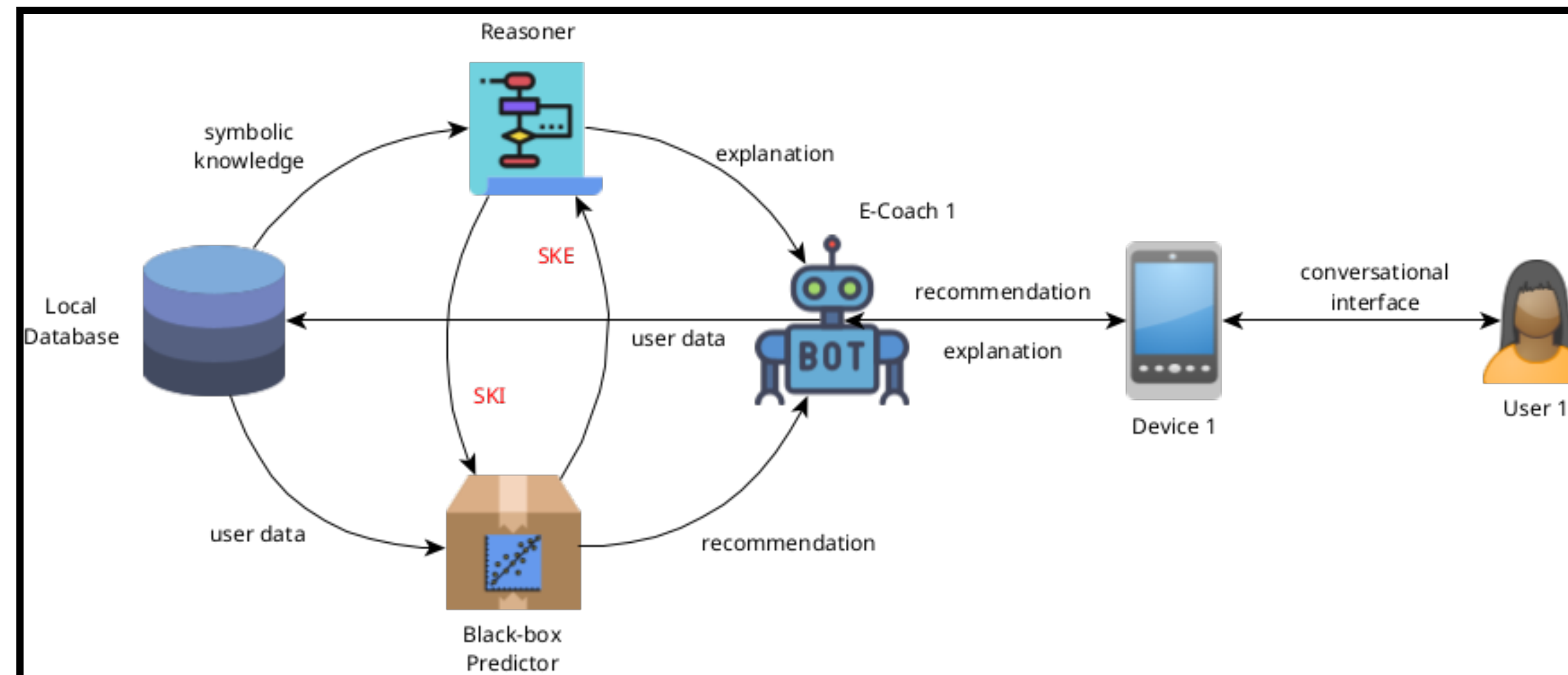
Enabling algorithmic assessment in terms of **fairness** and **transparency**, given the sensitive nature of the input data and the possible effects of the outcomes



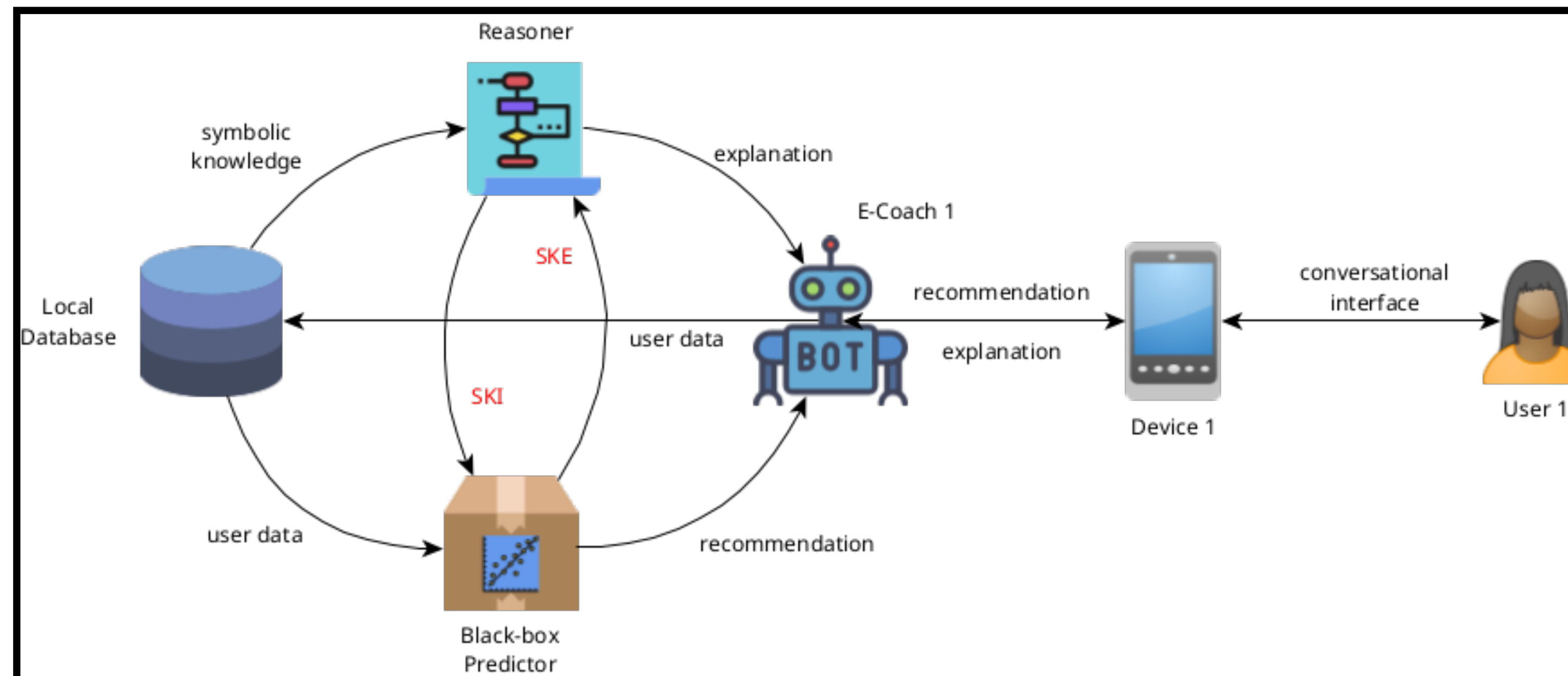


- 2 papers
- 1 framework

- **Single agent perspective**
 - symbolic + sub-symbolic processing capabilities
- **Need to move knowledge from/into the (sub)symbolic realm**
 - 2 key mechanisms
 - symbolic knowledge extraction
 - symbolic knowledge injection
- **Interoperability with semantic web technologies and linked data**



- **Symbolic knowledge extraction/injection: approaches selection**
 - surveyed ~90 methods for SKE and ~70 methods SKI
 - generalization of a coherent framework
- **Intra-agent XAI library implementation**
 - PSyKE (software library for SKE): 2 papers, 1 library, 6 SKE algorithms
 - PSyKI (software library for SKE): 1 paper, 1 library, 2 SKI algorithms
- **Semantic representation (HES-SO)**
 - designing an extension of Psyke Semantic Web Technologies
 - 1 paper + 1 software tool [ongoing]



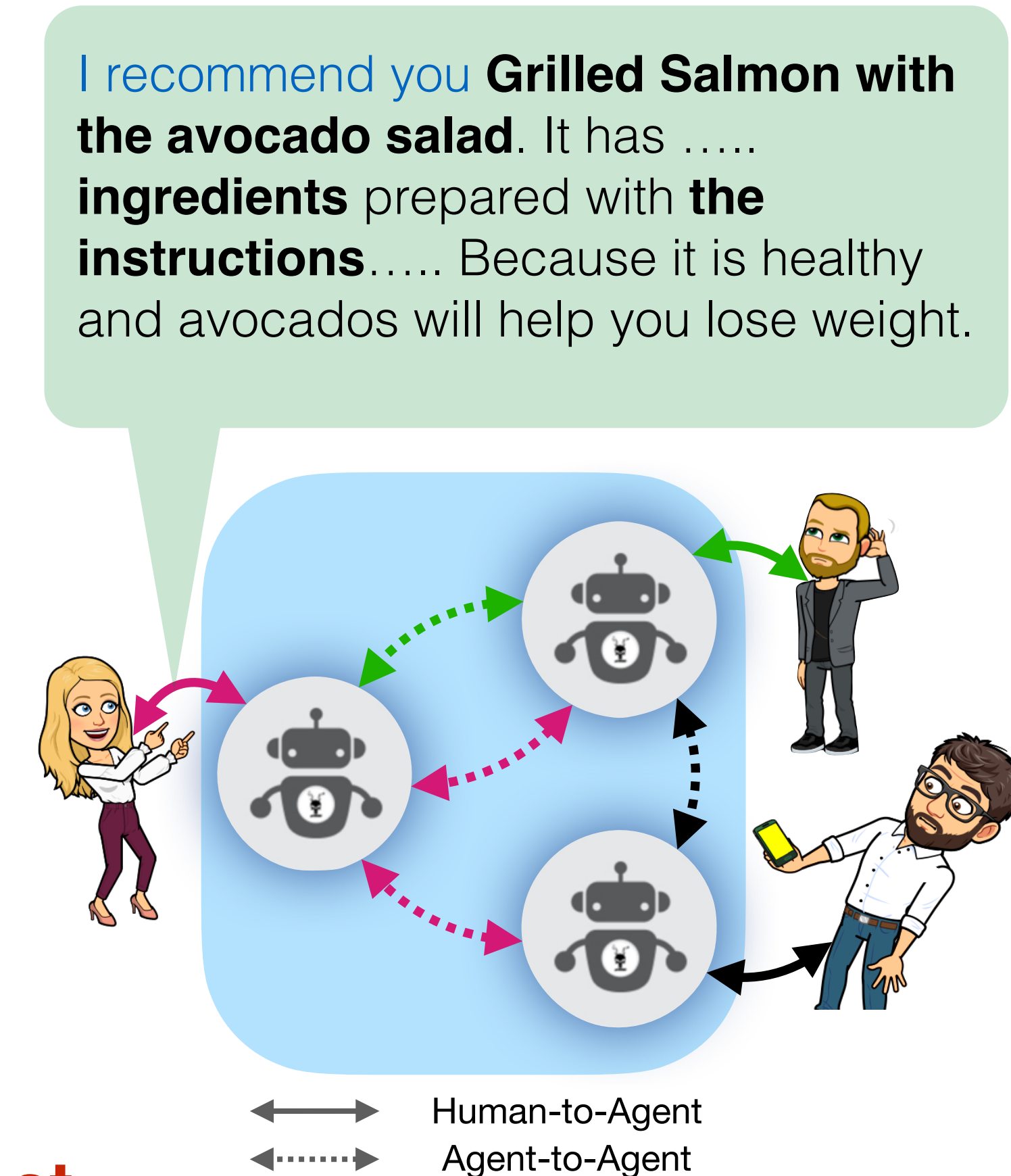
We designed an interaction protocol for **human-agent** negotiation in which:

The agent can

elicit user **constraints** and **preferences** via a pre-structured interaction, build up a user profile, generate **personalized** food recipe **recommendations**, generate **explanation for the given recommendations**, update the user modeling based on the given feedback.

The human users can

specify their **constraints** and **preferences** in a structured way, **evaluate** given recommendations and specify whether they **accept** or **reject**, give **feedback** on recommendations and “criticize” explanations, implicitly **update** the **system behavior** via these **counter-explanations**.

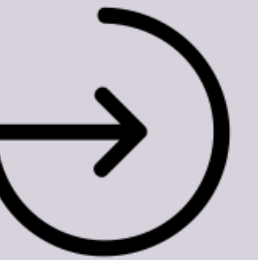
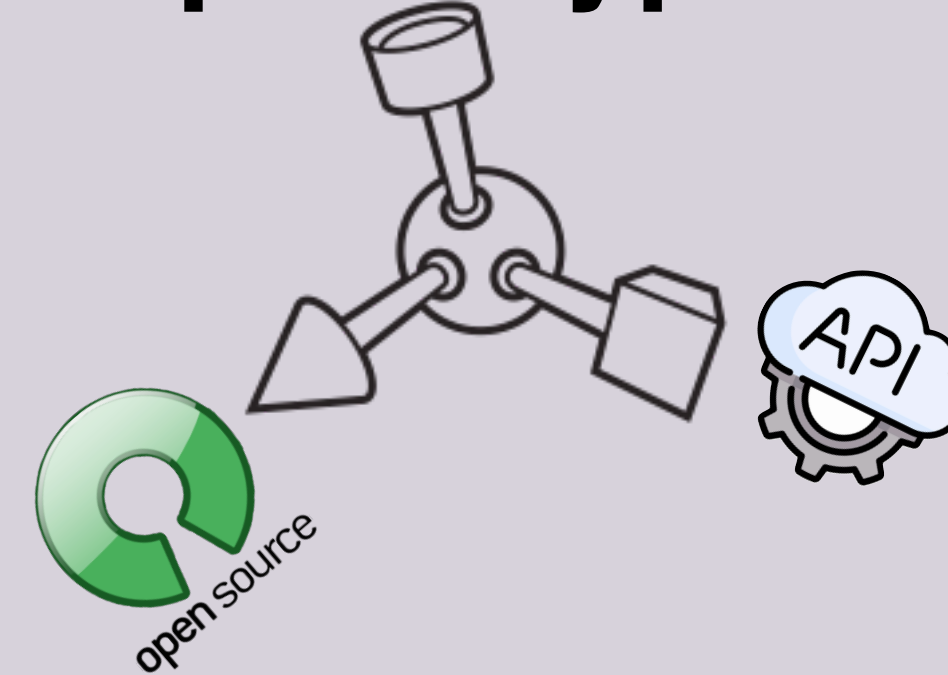


- 1 paper,
- 1 survey (~60 studies) [OG],
- 2 software libraries,

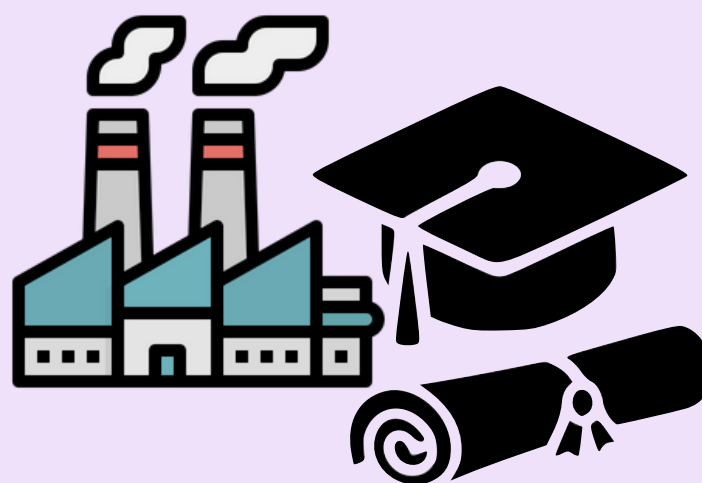
**OpenAccess
scientific papers**



**Working
prototype**



Networking Events



<http://expectation.ehealth.hevs.ch/>

Dissemination



<https://extraamas.ehealth.hevs.ch/archive> 4 May 2021

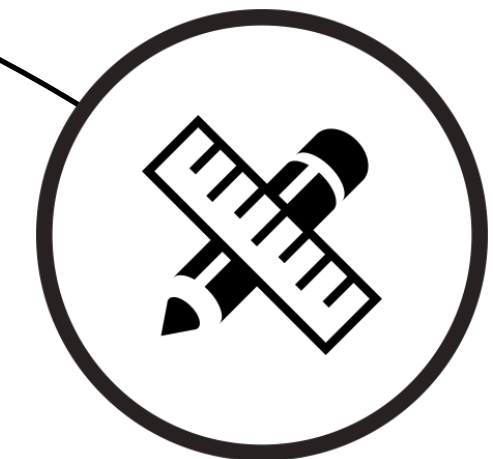
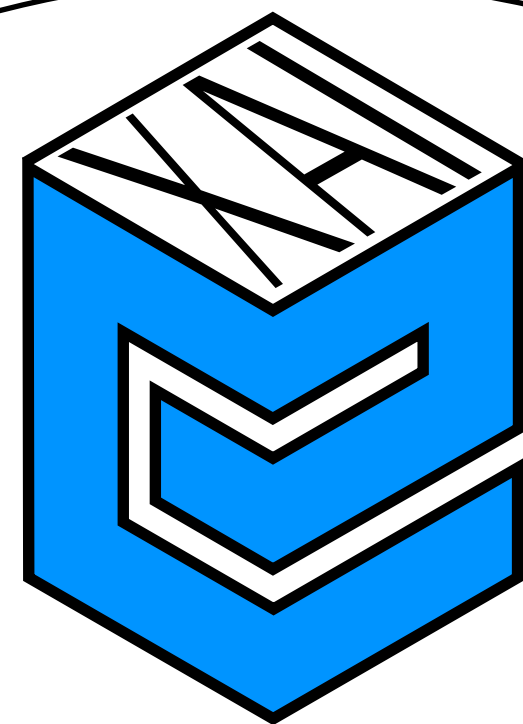
<https://extraamas.ehealth.hevs.ch> 9-10 May 2022

Other XAI-CHIST-ERA-related events Xxx May 2022

Personalized, transparent, and ethical
eHealth & wellbeing applications

New Theories for
XAI, ML, and MAS

XAI-by-design for
(sub)symbolic AI



XPECTATION

PERSONALIZED EXPLAINABLE ARTIFICIAL INTELLIGENCE FOR
DECENTRALIZED AGENTS WITH HETEROGENEOUS KNOWLEDGE

