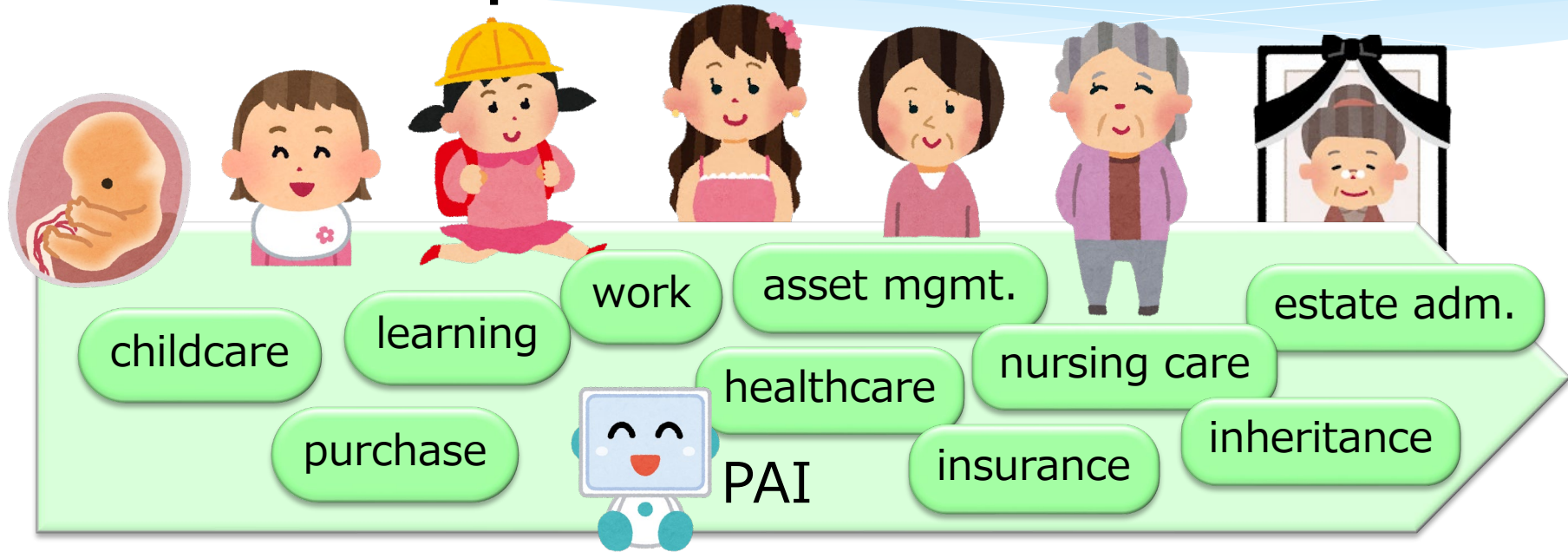


Future R&D Directions of Generative AI and Social Impacts

2023-06-30 HASIDA Koiti

Personal AI (PAI) Outvalues Centralized AI (CAI)

PAI Optimizes Your Life.



- dedicated exclusively to you
- exclusively utilizes all your personal data (PD)
 - decentralized PD management
- intervenes in your actions more deeply & carefully than other technologies
- needs governance to promote values while preventing damages & excessive paternalism

Living Assistance

- shopping, dining, exercise, etc.
 - cf. Amazon Anshin (Security) Mail



What would you advice about health to a person who bought diapers and honey at one time?



As an AI language model, I cannot give specific health advice without knowing more about your personal medical history and circumstances. However, I can offer some general advice regarding diapers and honey.

First, if you are purchasing diapers, it is likely that you are caring for a young child or an elderly individual who may require assistance with toileting. It is important to maintain good hygiene by frequently changing diapers promptly, and disinfecting surfaces that may come into contact with bodily fluids.

As for honey, it is generally considered a healthy food when consumed in moderation. Honey has natural antibacterial properties and may help soothe a sore throat or cough.

However, it is important to note that honey should not be given to infants under the age of one year due to the risk of infant botulism.

In general, maintaining a balanced and varied diet, staying hydrated, getting regular exercise, and getting enough sleep are all important factors in maintaining good health. If you have specific health concerns, it is always best to consult with a healthcare professional who can provide personalized advice based on your individual needs.

PAI may be realized anytime soon.

From CAI to PAI

- **versatile AI as personal portal to services and docs**
 - no need for people to directly access individual services (incl. search engines) and docs (Web pages, news articles, research papers, contracts, laws, etc.)
 - [Bill Gates Believes A Personal AI 'Agent' Can Replace Google, Amazon](#)
 - [Meta's Yann Le Cun: 'Soon we'll all have an AI-based personal assistant'](#)
 - [An investment fund created by ChatGPT is beating the UK's top 10 most popular funds \(unfair comparison?\)](#)
 - [Turn A.I. into your personal shopper](#)
- That AI will be PAI (decentralized).
 - PAI outvalues CAI, for both individuals and businesses
 - * by fully utilizing PD possibly containing sensitive info.
 - * because it never discloses PD to others
- stricter governance needed on PAI than CAI
 - PAI has larger potential merits and risks.

Behavior-Change Support

- service use
 - medical exam
 - consultation
- improvement of lifestyle, health-literacy, etc.
- disclosure of PD
- commencing work
- ...



You might want to go for a physical checkup on Tuesday because the meeting has been cancelled.

But maybe I'll have another job then.



Then how about Friday morning?

Well, uh...



I've reserved Tanaka Clinic for you.

I see. Thanks.



Open Citizen Science

meta-governance:

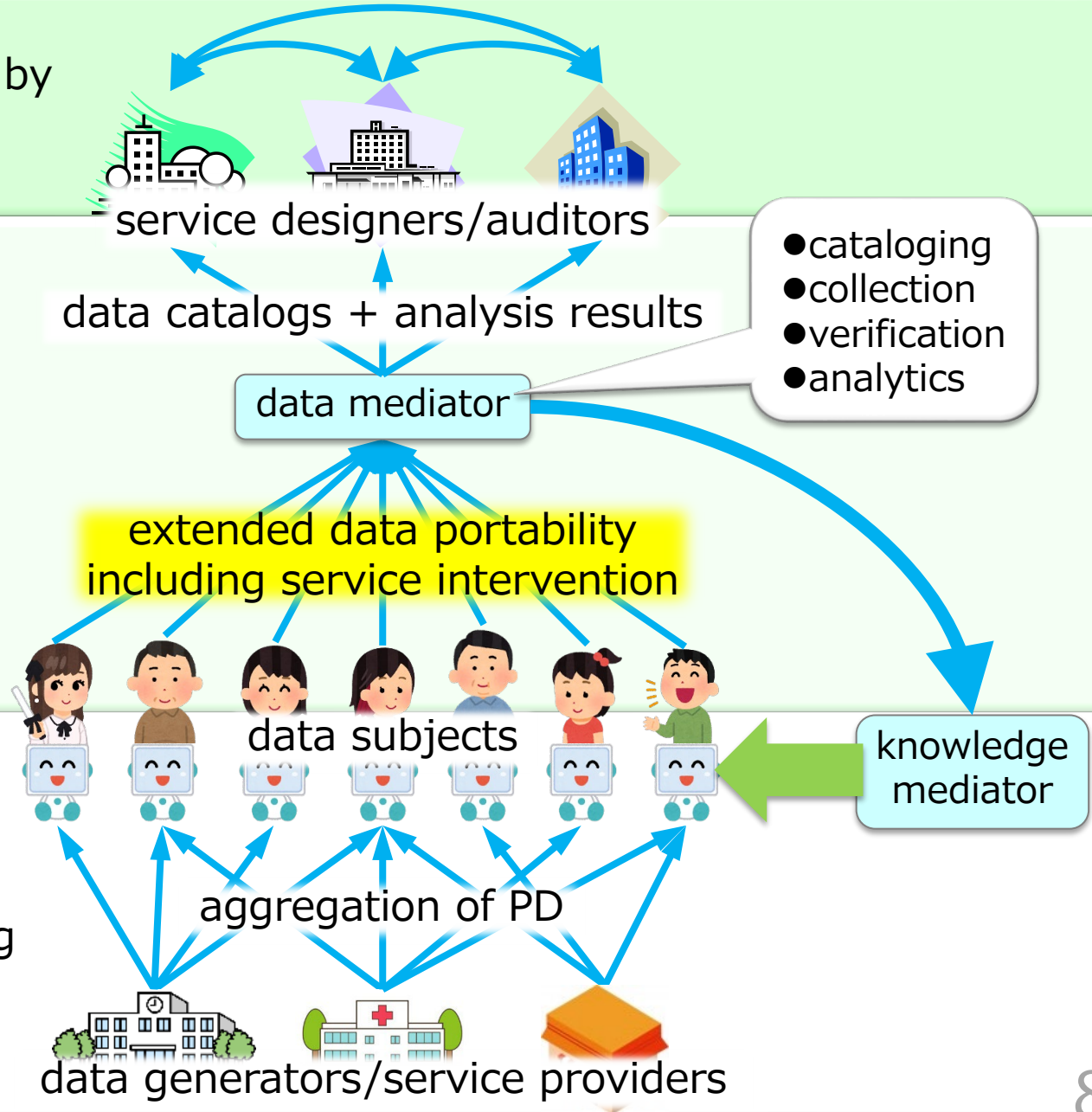
democratic governance by check & balance among designers & auditors

service governance:

- governance of PAI
- research on humans & societies
- development of goods & services
- policy planning & verification
- ...

service:

intervention to data subjects by fully utilizing their personal data



Human-Human & Human-AI Interactions

More Formal Data as Interaction Medium

simple data-meaning mapping

- More **formal** data is probably more tractable for both humans and AIs.
 - LLMs generate program codes better than natural-language texts.
 - But program codes are intractable for most people.
- What kind of formal data is actually convenient for both humans and AIs?

Graph Document

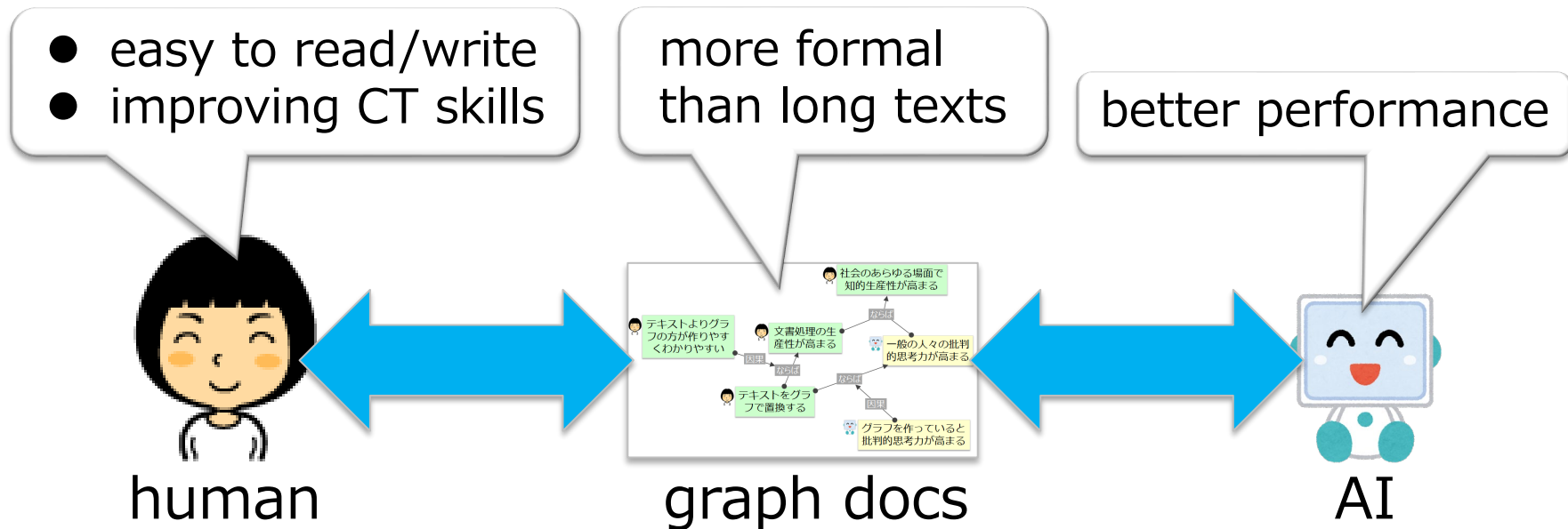
- more formal than long text: reduces cognitive load of text manipulation and enhances thoughts on semantic content
 - improves reading/writing efficiency and critical-thinking skills



Graph Composition at High Schools

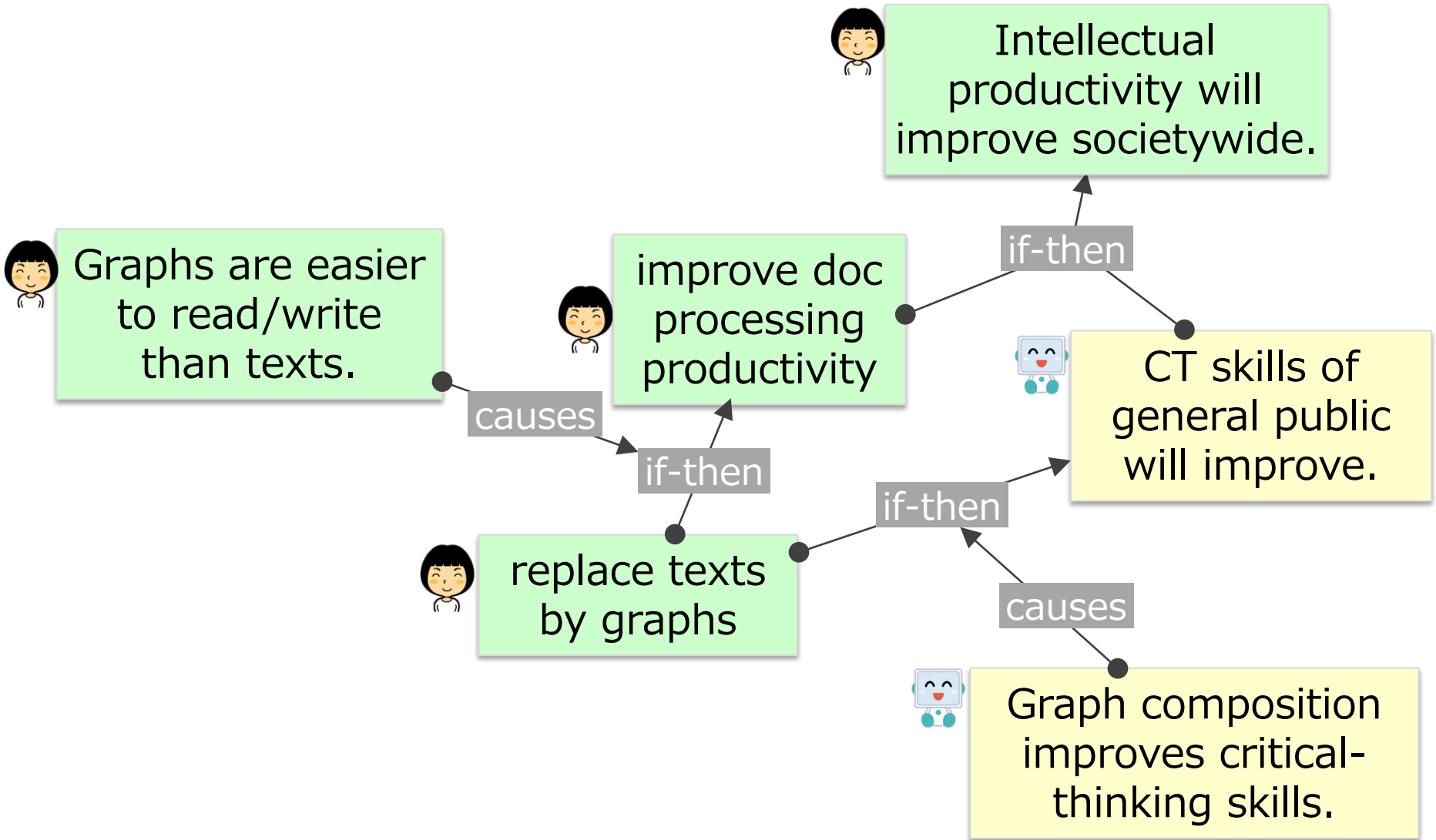
- experiment: 2022-10/2023-01
 - >100 pupils at 2 high schools
 - critical-thinking exam → 5 graph classes → CT exam
 - a graph class: Each group (2~5 pupils) composes a graph doc to summarize the group discussion and revise it to reflect comments.
- result
 - High-school classes can incorporate graph composition without hindrance.
 - * Teacher's workload does not increase.
 - * Pupils can compose graphs well-formed enough for teachers to comment immediately.
 - Pupils' CT skills improve.
 - * **positive correlation between graph-manipulation amount and CT-score growth:** $r=0.30$, $p=0.27\%$ (the correlation holds **99.73%**)
 - * Just 5 graph classes account for 9% of the CT-score change.
- conclusion
 - High schools can incorporate graph docs without hindrance and improve educational effects.
- implication
 - Workplaces can incorporate graph docs without hindrance and improve business performance.

Society-AI Co-Evolution



- Intellectual abilities of humans and AIs enhance each other, while graph docs increase in both quality and quantity.
- People with lower CT skills improve more.
 - gap reduction

Graph-Based Dialog



Concluding Remarks

Summary

- AI as the personal portal to all services and docs
- PAI outvalues CAI
 - for both individuals and businesses
- open citizen science
 - data-oriented agile governance by extended data portability
- Graph documents improve
 - human-human interactions
 - human-AI interactions
 - critical-thinking skills of humans
 - performance of AI

Towards Artificial General Intelligence

- cyclic inferences

- Human thoughts involve indefinite hypothesis-test cycles, which is impossible by feedforward networks.
- energy-based models, equilibrium models, etc.

- learning by real experiences

- Knowledge is basically grounded on physical reality.