1. Layer Structure of Generative AI Related Businesses
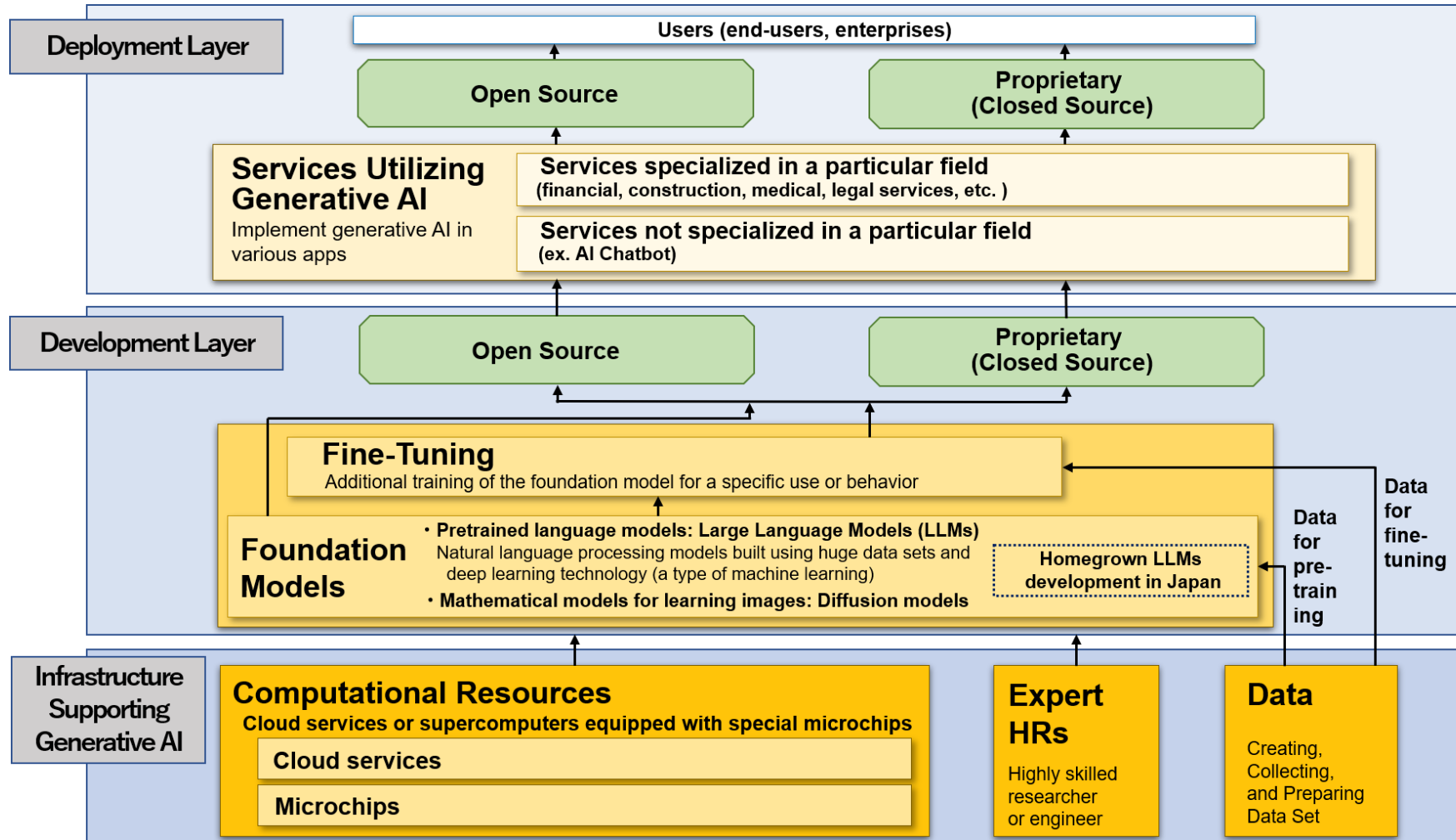
Generative AI related businesses can be roughly divided into three layers: (i) infrastructure supporting generative AI, (ii) development of generative AI, and (iii) deployment of generative AI, i.e. tools and services such as applications that utilize the developed foundation models or fine-tuned models.

Deployment Layer

Users (end-users, enterprises)

Open Source | Proprietary (Closed Source)

Services Utilizing Generative AI
Implement generative AI in various apps

Services specialized in a particular field (financial, construction, medical, legal services, etc.)

Services not specialized in a particular field (ex. AI Chatbot)

Development Layer

Open Source | Proprietary (Closed Source)

Fine-Tuning
Additional training of the foundation model for a specific use or behavior

Foundation Models
· **Pretrained language models: Large Language Models (LLMs)** Natural language processing models built using huge data sets and deep learning technology (a type of machine learning)
· **Mathematical models for learning images: Diffusion models**

Homegrown LLMs development in Japan

Data for fine-tuning

Data for pre-training

Infrastructure Supporting Generative AI

Computational Resources
Cloud services or supercomputers equipped with special microchips

Cloud services

Microchips

Expert HRs
Highly skilled researcher or engineer

Data
Creating, Collecting, and Preparing Data Set

Source：CMA "AI Foundation Models: Initial review" (Revised by CPRC)

2. Issues regarding the development, provision, and use of generative AI under Anti-monopoly Act and competition policy

Consideration of current competitive environment

➤ **Promotion and Diversification of Service Development**···The <u>active development and provision of foundation models</u> have <u>promoted the development of services</u> utilizing generative AI to generate various contents.

➤ **Existence of various options, including open source software**···The <u>variety of options</u> will ensure favorable competitive environments, such as <u>enabling entry</u> of a variety of new enterprises, <u>promotion of new services and innovations</u>, and <u>provision of a variety of choices</u> to customers.

Competition Policy Issues under discussion

➤ **Access**···Enterprises that already have <u>extensive access to data set may have strong competitive advantages</u>. Difficulty in accessing data set <u>may be a barrier to entry</u>.

➤ **Self-Preferencing**···Providers of foundation models may develop the foundation models so that <u>their own goods and services can appear more favorably</u>. Likewise, providers of services using foundation models <u>may treat their own goods and services more favorably</u> in their services.

➤ **Tying, Enclosing**···<u>A dominant player</u> at one layer may <u>tie together another service</u> it provides at another layer, thereby inhibiting competition at that another layer. <u>Business combinations or alliances</u> may be formed with the aim of <u>incorporating technology or retained data</u>, or of <u>locking in</u> highly skilled professionals.

➤ **Learning from Creative Data**···Generative AI which <u>learned by using creative data</u> is potentially <u>in competition with creative businesses</u>. The generative AI may establish <u>potent competitive advantages</u> over the creative businesses, resulting in undermining opportunities for competition for them.

3. Direction of approach

- <u>Need to catch up with rapid progress</u> of generative AI, and to <u>make efforts to enable agile responses</u>
- To achieve these ends, <u>need to make continual efforts to understand</u> development and implementation of it.