Kudan Inc. (4425)	

Corporate Information

Exchange	TSE Growth
Industry	Information and communications
Managing Director & CEO	Daiu Ko
Address	2-10-15 Shibuya, Shibuya-ku Tokyo
Year-end	End of March
URL	https://www.kudan.io/

Stock Information

Share Price	Shares Outstanding (end of term)		Total market cap	ROE Act.	Trading Unit
¥3,045	8,480,467 shares		¥25,823 million	-213.9%	100 shares
DPS Est.	Dividend yield Est.	EPS Est.	PER Est.	BPS Act.	PBR Act.
0.00	-	¥-39.95	-	¥77.52	39.3x

*The share price is the closing price on December 1. Shares Outstanding, DPS, and EPS are taken from the financial results of the second quarter of the term ending March 2023. ROE and BPS are the result of the previous year.

Earnings Trend

Fiscal Year	Sales	Operating Income	Ordinary Income	Net Income	EPS	DPS
Mar. 2019 (Actual)	376	123	103	103	15.35	0.00
Mar. 2020 (Actual)	456	9	-12	-29	-4.17	0.00
Mar. 2021 (Actual)	127	-451	-1,575	-1,608	-214.97	0.00
Mar. 2022 (Actual)	271	-433	-681	-2,237	-283.74	0.00
Mar. 2023 (Estimate)	500	-350	-300	-315	-39.95	0.00

*Unit: yen, million yen. Net income is profit attributable to owners of the parent. Hereinafter the same shall apply. The earnings forecasts are that of the company.

This report briefly describes Kudan Inc., the financial results of the second quarter of the term ending March 2023, and growth strategies.

Table of Contents

Key Points

- **Kudan Inc. is a company that carries out research and development of deep technology specializing in the algorithms for artificial perception (AP), which corresponds to the "eyes" of machines (computers and robots). Its strengths and characteristics include the capability of flexibly responding to the growth of diverse demand, which is expected in the future, and a group of professionals in AP. The company has secured a firm position based on the alliance with Artisense Corporation, which is led by Professor Daniel Cremers, who has produced globally recognized research results as a pioneer in self-driving technologies.**

- **By underpinning a variety of advanced technologies in addition to the applications whose applied development has already progressed, AP technologies are expected to be applied and integrated into many fields, and put into practice faster than expected. In such a market environment, the company will fuse AP technologies with AI and IoT, and cultivate applicable domains in a multistage manner. In addition, the company will accelerate and expand clients' commercialization, operate the solution business, and expand the business. To do so, the company carried out financing.**

- **The sales in the second quarter of the term ending March 2023 were 155 million yen, up 40.0% year on year. Sales continued to grow due to the accumulation and upsizing of mainly evaluation and development projects. Operating loss was 312 million yen. Cost of sales and SG&A expenses increased as Artisense became a consolidated subsidiary. The company posted an ordinary loss of 81 million yen. Due to the yen's depreciation, a foreign exchange loss of 7 million yen in the same period of the previous year turned into a foreign exchange gain of 232 million yen.**

- **There is no change in the earnings forecast. In the term ending March 2023, sales are expected to increase 83.8% year on year to 500 million yen. The company also expects significant sales growth in this term, mainly due to the accumulation and upsizing of evaluation and development projects. In addition to licensing and development support income for evaluation and development projects, product licensing revenues will contribute to sales in the future due to the progress of clients' commercialization. Still, its full impact will start from the next term. The company is projected to post an operating loss of 350 million yen and an ordinary loss of 300 million yen. The costs of Artisense, which were considered for only three months in the previous term, will be included for the full year this term, so the cost of sales and SG&A will augment year on year, but the company will improve its cost structure by the end of the term. As non-operating revenues, the company is expected to receive R&D subsidies in the U.K. and Germany.**

- **Steady progress has been made in clients' commercialization. Following the first project (July 2022, Chinese business partner Whale Dynamic's project) introduced in the previous report, two projects were finalized for clients' commercialization in October. In August, the expected number of cases of clients' commercialization for this term was revised upward from three at the beginning of the term to four. Three projects have been finalized, and the remaining three promising projects are scheduled to be finalized in the current or next fiscal year.**

- **Regarding the status of the exercise of stock acquisition rights to raise funds for growth, Tranche 1 raised 630 million yen, approximately 20% larger than the originally planned amount of 530 million yen, due to a rise in stock price. On the other hand, Tranches 2 and 3 met the conditions for clients' commercialization through the Intel project and the USC project, but did not meet the stock price condition of a base price of 5,000 yen or higher for Tranche 2 and 7,500 yen or higher for Tranche 3. Thus, it did not fulfill all the exercise conditions.**

- **The daily fluctuation in stock price is a matter of concern, for checking whether they can meet the stock price conditions. The progress in essential business development, such as further expansion and acceleration of clients' commercialization, is a major factor in the rise in stock price. We will also continue to pay attention to future product releases and progress in research and development.**

1. Company Overview

Kudan Inc. is a company that carries out R&D of deep technology (or deep tech), specializing in algorithms for artificial perception (AP) which acts as the eyes of machines, such as computers and robots.
Working in pairs with artificial intelligence (AI), which serves as the brain of machines, to complement each other as deep tech, AP helps machines evolve to function autonomously. The company operates business based on its unique milestone model focused on the deep tech that has an impact on a wide range of industries through highly sophisticated technological innovations.

【1-1 Corporate history】

Mr. Tomohiro Ohno, currently serving as a Managing Director, became convinced of the prospects and growth potential of the AP technology when working at Andersen Consulting (currently Accenture PLC) and set up Kudan Limited in the United Kingdom in January 2011, at which he pursued his own research and development on the Simultaneous Localization and Mapping (SLAM) technology that provides a basis for the AP technology.
In November 2014, he established Kudan Inc. intending to extend the administrative department through business expansion while moving further ahead with his research and development. The company started offering evaluation software for demonstration of the Kudan SLAM technology in December 2016 and officially began to provide Kudan SLAM in the term ended in March 2018.
It got listed on the Market of the High-Growth and Emerging Stocks (Mothers) of the Tokyo Stock Exchange (TSE) in December 2018.
In April 2022, the company got listed on the Growth Market of TSE, through market reclassification.
Consisting of four inside directors, Managing Director & CEO Daiu Ko, who joined the company after working for Toyota Motor Corporation and McKinsey & Company, Managing Director Tomohiro Ohno, Kohei Nakayama, a director and CFO, and Mr. Ken Iizuka, CVC and a director in charge of new business, Kudan's management team places a heavy emphasis on swiftness.

【1-2 Corporate philosophy】

Kudan's corporate philosophy is "**to stand alone, and dare to create what is new and different**."

The philosophy guides the company into avoiding following suit and daring to challenge the generally accepted wisdom. Embracing the philosophy, the company aims to expand its business and research and development, raise shareholder interests, and become a one-of-a-kind company in the market by formulating policies that enable them to stand out from all other companies.

While adopting a corporate vision of "Eyes to the All Machines," Kudan aims to become a player that offers technology essential for full autonomy and automation, goals that all kinds of machines and devices will strive to reach.

【1-3 Market environment】

In recent years, the increasing need for automation of operations in every industry and advancement of hardware technology, including sensors and semiconductors complementary to algorithms, have been rapidly spreading and practically utilizing the AP algorithms.

In addition, the impact of the spread of COVID-19 has resulted in soaring demand for saving labor and working remotely for operations that require neither human interaction nor group work in all industries. The growth of demand for automation technology, such as robotics, autonomous driving, and drones, is significant particularly in the fields of logistics, manufacturing, construction, retail, etc.

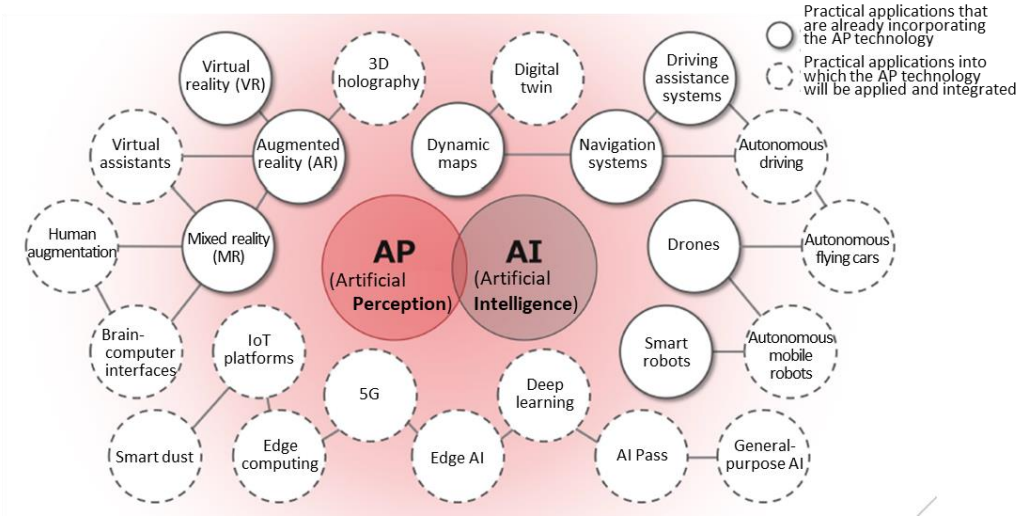
The material for the 10th meeting for discussing new governance models for realizing Society 5.0 held on October 6, 2020 by the Ministry of Economy, Trade, and Industry (METI), which was titled "Reference material 2: Case studies for estimating the economic impact of advanced technology," provides estimates for the economic impact of the Internet of Things (IoT), artificial intelligence (AI), autonomous driving systems, and drones as follows:

Technology/device	Economic impact
IoT	Real GDP boosted by the increase in the use of IoT and AI is estimated at **132 trillion yen in 2030**.

Technology/device	Economic impact
	The number of people in employment in 2030 when the use of IoT and AI is promoted is facilitated further is estimated to be 63 million, up 7,390,000 compared to the number of people employed wthe hen use of IoT and Ai is not promoted.
AI	GDP in 2030 is expected to be 9.8% (11.2 trillion dollars) to **14% (15.7 trillion dollars) higher** with an impact of AI than without.
Autonomous driving systems	It is projected that the passenger economy (*) will stand at **800 billion dollars in 2035 and 7 trillion dollars in 2050** globally when autonomous cars are put into practice. The economic impact is broken down into Mobility as a Service (MaaS) for consumers (3.7 trillion dollars), MaaS for businesses (3.0 trillion dollars), and newly emerging driverless vehicle services (0.2 trillion dollars). *The passenger economy: economic and social value realized by level-5 fully autonomous cars
Drones	The market scale of the drone business in Japan is forecasted to be 193.2 billion yen in FY 2020, up 37% from the year before, and reach **642.7 billion yen in FY 2025 (about 3.3 times larger than that of FY 2020)**. Drone services were the strongest market in FY 2019 with a 68% year-on-year increase to 60.9 billion yen followed by the drone body market which grew 37% year on year to 47.5 billion yen and the drone peripheral services market which showed a 46% year-on-year rise to 32.6 billion yen. These three markets are expected to continue booming, with the market scales for FY 2025 are estimated at **442.6 billion yen (about 7.3 times greater than that of FY 2019) for the services market, 122.9 billion yen (about 2.6 times greater than that of FY 2019) for the body market, and 77.1 billion yen (about 2.4 times greater than that of FY 2019) for the peripheral services market**, respectively, in descending order.

*Created concerning "Reference material 2: Case studies for estimating the economic impact of advanced technology" used at the 10th meeting for discussing new governance models for realizing Society 5.0 as posted on METI's website. The red and bold parts were provided by Investment Bridge Co., Ltd.

In addition to these applications that are already under development, there are many areas where AP (Artificial Perception) technology will be applied and integrated in the future by supporting various advanced technologies, and it is expected that AP (Artificial Perception) technology will be implemented in society at a speed beyond what was previously expected.



(Taken from the reference material of the company)

【1-4 Business content】

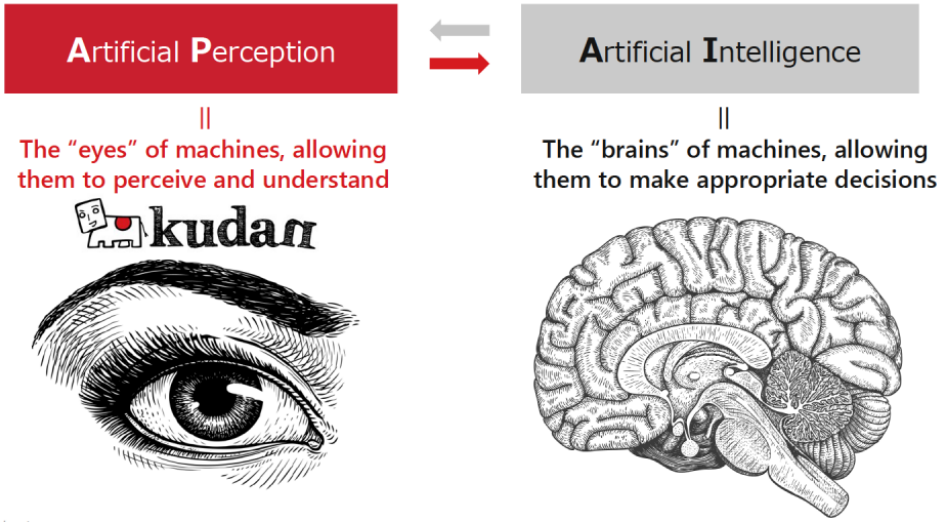
Kudan has issued a license for Kudan SLAM, a software for integrating such algorithms as SLAM, which is the mission-critical technology of AP, into hardware, and grants it to customers.

It is essential to learn about AP (Artificial Perception) and SLAM to understand the business and technological superiority of Kudan. Below are descriptions of AP and SLAM.

<What is AP?>

Artificial perception (AP) is a technology put forward by Kudan Group that is carrying out research and development thereof.

Following the recent advancement of AI, a technology that substitutes the human brain, machines such as computers and robots, which have worked only under the instruction and command of humans for many years, are believed to evolve to function autonomously independently of people's control.
The technologies crucial for this evolution are AI which is the brain with which machines can make decisions and AP, one of the advanced technologies that act as the eyes of machines with which they can perceive their surroundings.
Coordinating and complementing mutually with AI which is the brain, AP as the eyes helps machines (robots and computers) work and function autonomously.

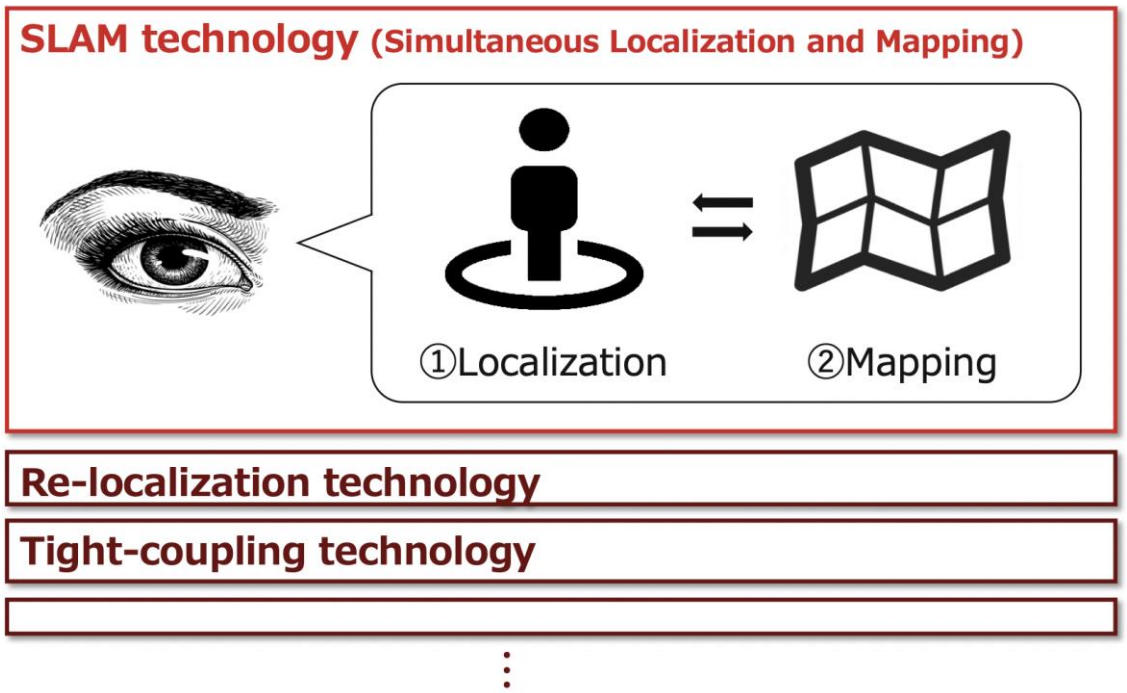


(Taken from the reference material of the company)

As mentioned above, AP is a technology that imparts advanced visual capabilities to machines just like the human eye.
What plays a central role to enable AP to fully demonstrate the required capabilities, is SLAM.

<What is SLAM?>

SLAM is a technology for each computer to concurrently "estimate the self-location (localization: checking where you are)" and "produce a three-dimensional map (mapping: checking your surroundings)" in the real environment based on data input from external sensors, such as cameras and lidar.
It is possible to record how you have travelled in a new environment while producing a map (tracking) and recognize where you are based on a previously produced map (re-localization).



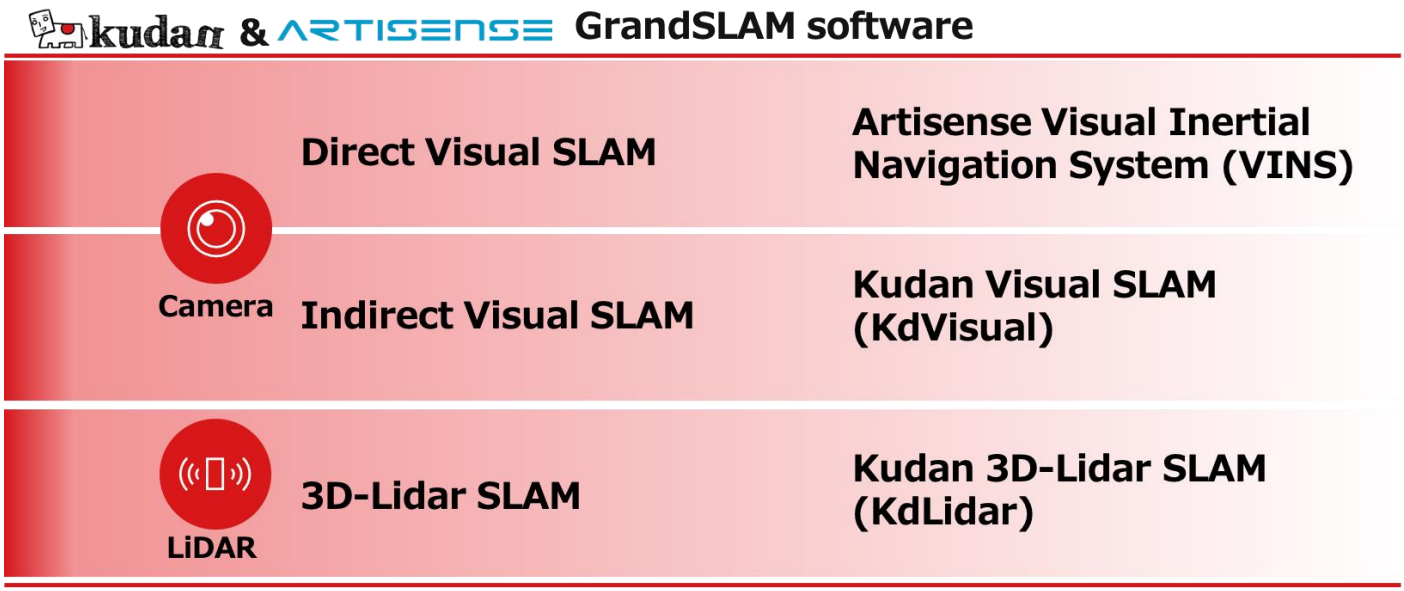
(Taken from the reference material of the company)

Taking a car applied with the SLAM technology as an example, the technology localizes the car based on a computer program of mathematically processing the distance that the car has travelled, camera images, and sensor information provided by Lidar, which is a sensor using laser light, and outputting three-dimensional information (such as the direction, distance, and size) and kinesthesia (such as the location and movement) on a real-time and precise basis and, at the same time, makes a three-dimensional map based on data on the surroundings amassed by the sensors.

In the case of cars, SLAM enables drivers to obtain basic information for safe travel by car by using a three-dimensional map drawn from time to time by the technology while driving cars, even if they have no information in advance on road conditions (such as the location of cars driving in the front, back, left, and right of their cars, how fast the cars in all directions drive, the road width, and the number of road lanes).
Differing from GPS, which detects a position with external radio waves, and beacons, it recognizes the self-position in a stand-alone manner, so it can be used in a broader range of environments, situations, and cases.

SLAM is the most critical technology for AP, and what are extremely important are precision and processing speed when it comes to ensuring the safety in autonomous cars. Such technological issues have been pointed out as obstacles to using SLAM for general purposes.

In this regard, GrandSLAM offered by the Kudan Group is comprised of three different SLAM algorithms, each of which has its own unique strengths.



Kudan Indirect Visual SLAM, for example, is capable of processing information over 10 times faster with less processing power than the most prominent open-source software of camera-based SLAM technology. Compared to other solutions that can generally give only centimeter-level localization precision, such as 5 cm, the precision of Kudan Indirect Visual SLAM can be as small as millimeters.
By combining these algorithms, etc., the company aims to further improve the function with higher speed and higher precision both indoors and outdoors, using multiple sensors, such as cameras and Lidar, together by integrating the systems through clock synchronization between the sensors (a process called tight coupling).
This technological superiority has been enhanced further by the acquisition of Artisense Corporation as its subsidiary as mentioned later.

Kudan began offering Kudan Indirect Visual SLAM under the name of Kudan SLAM in the term ended March 2018. Then, it started to provide Kudan 3D-Lidar SLAM in March 2020. The company has been striving to broaden the customer base in the following three areas:

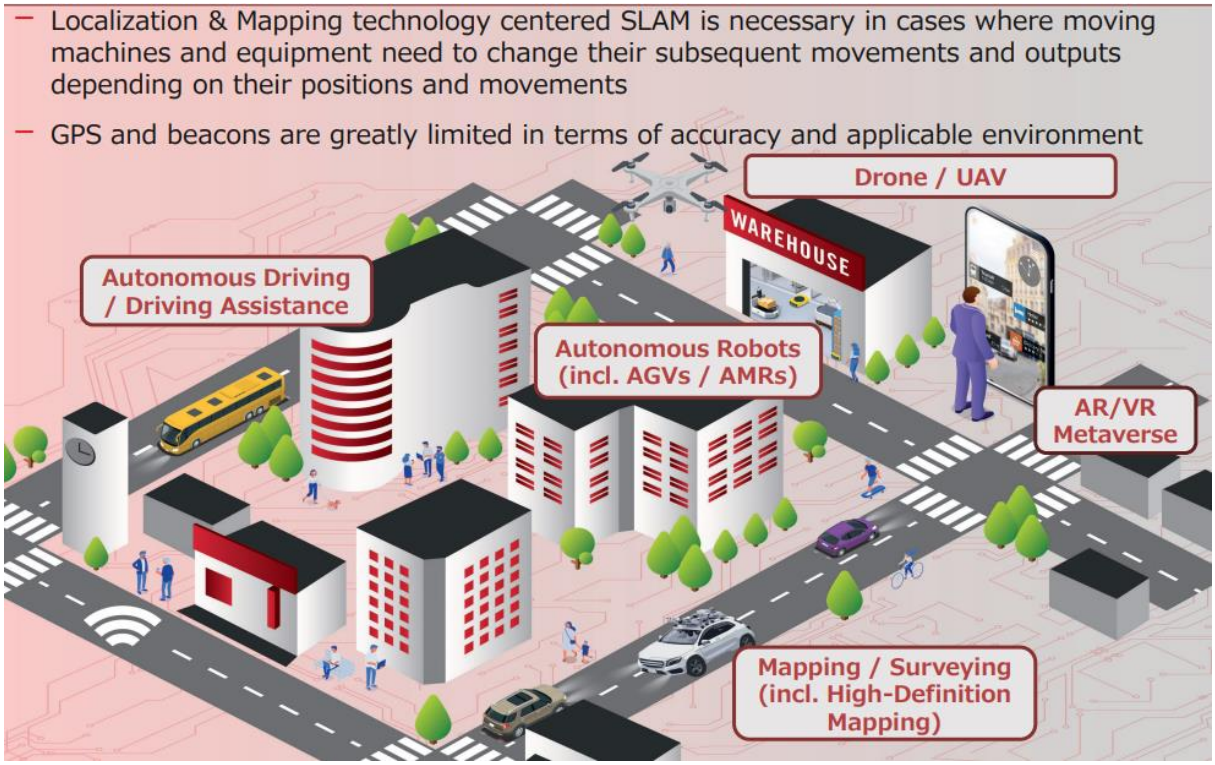
Area	Example customers
Augmented reality (AR) and virtual reality (VR) application area	Optical sensor manufacturers, optical equipment manufacturers, mixed reality (MR) glasses manufacturers, telecommunications equipment manufacturers, electrical equipment manufacturers, e-commerce platforms, computer games producers etc.
Robotics and IoT area	Optical equipment manufacturers, heavy industrial and industrial robot manufacturers, electrical equipment manufacturers, transportation equipment manufacturers, signal processing internet protocols (IPs), etc.
Application area targeting cars and maps	Car components manufacturers, digital map companies, spatial information consulting companies, etc.

<Growing number of fields in which AP can play roles>
Using one of the existing technologies called computer vision (a set of base technologies of sensor and image processing mainly on a two-dimensional basis) as the foundation after reconstructing it, Kudan has developed its own unique AP technology.

As AP is the base technology necessary for every kind of device that uses cameras and three-dimensional sensors, the company expects that it will be the base technology adopted to diverse next-generation solutions on a cross-cutting basis.

It has been a technology essential for automatic control of all autonomous machines as robotics in a broad sense, including industrial robots, domestic robots, next-generation mobility such as cars, and flying machines such as drones, just to name a few.

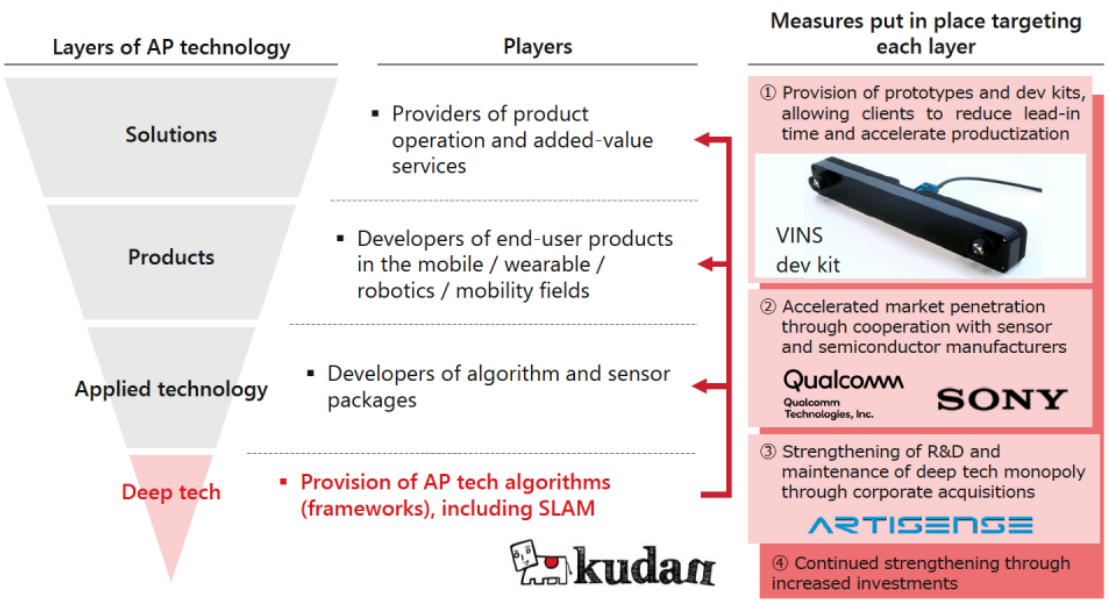
It will also be required for spatial perception in AR and VR that will serve as user interfaces of next-generation computers.
In addition, the technology will be applied to an extremely wide range of purposes as the base technology for next-generation digital maps, dynamic maps (a dynamic mapping system that swiftly reflects the conditions of the reality environment), digital twin (information on the virtual space synchronized with the reality environment on a real time basis), and the like.



(Taken from the reference material of the company)

【1-5 Business strategies】

Kudan focuses on carrying out research and development and offering AP algorithms, such as SLAM, which is a deep tech that is equivalent to the base technology locating at the lowest level of the AP technology pyramid, under solutions, finished products, and application technology of various industries.
Kudan's business strategy is aimed at maintaining and further increasing its monopolistic market share as a special and independent company in the AP market by forging alliances on a global basis with multifarious players of all the levels of the pyramid, which are solutions, finished products, and application technology, and enticing them as customers while maintaining its position without relying on any specific company in terms of business development and finance.



(Taken from the reference material of the company)

<Acquisition of Artisense Corporation as a subsidiary and business alliance therewith>

One of the most noteworthy points of the Kudan Group's business strategies is the acquisition of Artisense Corporation (whose headquarters are based in the United States) as a subsidiary and a business alliance with the company.

(Overview of Artisense Corporation)

With such fields as autonomous driving, robotics, AR and VR, and drones being its application areas, Artisense Corporation provides AP algorithms that perceive the space and location, taking pride in its capability of putting camera-based visual SLAM into practice on a commercial level.

Artisense Corporation was founded in 2016 jointly by Professor Daniel Cremers, who has delivered the world's best research results as the leader of the Technical University of Munich (TUM) that has a world-leading research group in AI and computer vision and as a leading expert on the autonomous driving technology, and Mr. Andrej Kulikov, a serial entrepreneur.

The Artisense Group consists of three global companies, which are the parent company that is based in Silicon Valley, California, U.S., a German company engaging in research and development in collaboration with TUM and the European auto industry, and a Japanese company devoted to business development in the Asian region.

Artisense conducts research and development on AI and computer vision and offers technology related thereto in the field of the spatial and location perception technology, in which Kudan operates business, and the strength of its direct visual SLAM, in particular, lies in the algorithms developed through approaches different from those taken by Kudan.

(Purposes of the acquisition of Artisense Corporation as a subsidiary)

Although Artisense Corporation is a direct competitor, Kudan entered into a contract with it in January 2020 for gradually getting its shares with the intention of acquiring it as a subsidiary.

By grouping together leading companies in the increasingly oligopolistic field of artificial perception (AP) technology, Kudan aims to consolidate its position as one of the world's largest forces in the field of artificial perception and SLAM, and to secure an overwhelming market share by increasing its competitive advantage and growth potential.

In addition, the technological collaboration between the two companies is expected to solidify their footing by securing IP (intellectual property) for future technologies, and synergistically improve performance by complementing the technologies in which each company excels, thereby realizing advanced spatial and positional recognition in more complex environments.

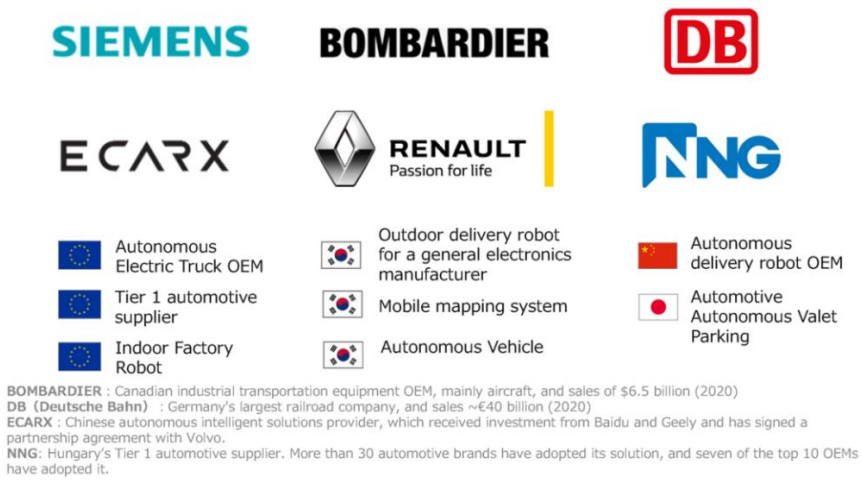
Kudan concluded a business alliance with Artisense in May 2020.

Specifically, in research and development, Kudan aims to develop and put into practice its unique GrandSLAM, an algorithm that is as most sophisticated as one can theoretically think of by achieving a breakthrough with integration of the direct SLAM that Artisense

uniquely possesses as a next-generation technology into Kudan's indirect SLAM, or into Kudan's Lidar SLAM technology, and Artisense's deep learning-based AI technology called Deep Feature.

By realizing such breakthroughs through industry-leading technology commercialization, Kudan believes that it can further promote technology-driven market growth in areas of automated driving, robotics, AR/VR, and drones.

These efforts are not just limited to research and development, but are already leading to a number of projects on a global scale, backed by world-class technology, including the following.



(Taken from the reference material of the company)

Regarding business development, the company will further enhance its sales structure globally in Asia, including Japan and China, Europe, and North America.
As mentioned earlier, it also strives for dramatic medium- and long-term growth through such efforts as to forge ahead with further development and investment in deep tech, as well as to retain and enrich researchers and engineers specializing in SLAM, whose recruitment will be more difficult because the number of such experts is believed to become limited, enrich personnel engaging in business development in global sales locations, invest in partner companies for expanding product and solution development, and develop and put into practice GrandSLAM.

The purposes and achievements of the merger and acquisition so far are as follows:

Purpose	Overview		Achievements
To secure experts whose number is getting small	-Prof. Daniel Cremers of Artisense is an internationally respected authority on research into AI and autonomous driving systems. -About 20 leading engineers are engaged in research and development under Prof. Cremers.	⇒	Successfully retained existing human resources. Continuously secured engineers from TUM's pool of top engineering talent. Together with Kudan, they form a team of 30 top engineers.
To secure next-generation technologies	-Direct SLAM, which is more similar to human perception. -Integrating SLAM with deep learning, which will be essential for putting finished products into practice.	⇒	Successfully made next-generation technology into products and launched them onto the market. Verified the effectiveness in the market through multiple PoC (*) projects.

*PoC

PoC stands for Proof of Concept, which is verification and demonstration in a preliminary step before prototype development with the aim of verifying new concepts, theories, principles, and ideas.

(Process of the subsidiary acquisition)

The share transfer agreement entered into in January 2020 stipulates that Kudan acquires all the shares of Artisense held by the seller not in a lump in an early stage but through three closing steps.

The contract was so designed to provide Artisense's officers and employees, who are the members of the seller, with stronger incentives to continuously getting involved in the operations of Artisense and improvement of its business performance, as well as to control the risks that Kudan will face, by designing a step-by-step acquisition. In addition, the agreement allows to motivate the seller to continuously improve Artisense's business performance by flexibly adjusting the third closing date and payment of the acquisition to the business result of a certain period.

After Artisense became an equity-method affiliate of Kudan through the first closing (January 2020, acquisition of approximately 1.49 million shares, or 12.0% of the total outstanding shares) and the second closing (July 2020, acquisition of approximately 3.23 million shares, or 26.0% of the total outstanding shares), the gradual integration of the companies has progressed smoothly. Against this background, the third closing, which was scheduled to take place by December 2022, took place in December 2021, making the company a wholly owned subsidiary.

【1-6 Competitive superiority】

(1) Technological features

Kudan believes that its AP technology has enormous advantages in taking in not only the existing demand for product development but also demand for research and development on highly novel and complex future technologies, because the AP technology can help the company strategically take in technological demand fueled by continuous advancement and wider applications of the technology in mid-/long-term.

According to the company, the AP technology has the following five features.

Kudan can flexibly fulfill future demand, which is expected to grow and be diverse, by combining their sophisticated and flexible research and development capabilities that they cultivated by focusing on the AP field:

Feature	Overview
(1) Uniqueness of the algorithms	The Kudan Group possesses diverse families of technologies that consist of uniquely developed algorithms. Regarding how to perceive image feature points (fairly noticeable local areas in an image) that provide the basis for perceiving three-dimensional geometric structures at an advanced level, for example, the company has developed a unique, high-speed and greatly precise method by integrating and hybridizing a high-speed perception method and a highly precise and stable perception method. Furthermore, the density of feature points perceiving within an image can be adjusted flexibly to optimize the precision of perceiving three-dimensional structure (a set of three-dimensional feature points) and the processing speed, according to the practical application environment. In addition, a wide range of unique mathematical models that guarantee the feasibility of the technology are integrated, including optimized calculation that increases the precision of a group of three-dimensional feature points perceived sequentially in a three-dimensional manner, and a high-speed matching method with already-known, stored data.
(2) Flexibility and powerful performance	The uniqueness of the algorithms allows high-speed processing (with a light calculation load) as well as realizes great perception precision (which means that deviation from a true value is slight) and robustness (which indicates that the technology performs stably regardless of the environment and conditions in which it is used). In addition, the AP technology will be able to deliver strong performance that is optimized for a myriad of practical applications as it is designed in a manner that allows users to make detailed adjustments to the perception precision, robustness, processing speed, data size, and other individual

Feature	Overview
	functions according to the conditions under which the technology is used and required specifications.
(3) Flexibility in sensor use	As limiting the number of sensors can narrow the scope of applications of the AP technology, the Kudan Group's technology is designed to be compatible with various sensors. Specifically, it can function with a variety of cameras, the technology can be adjusted flexibly according to the number of cameras (such as monocular cameras, binocular cameras, and multiple cameras), and the data read format of optical sensors (such as whether to read data sequentially or simultaneously). Besides cameras, the technology can also be combined with a multitude of sensors, including three-dimensional sensors (such as Lidar and Time of Flight (ToF)), internal sensors (such as inertial measurement unit (IMU) and machine odometry), and position sensors (such as the Global Positioning System (GPS) and Beacon), which will allow advanced application of the technology while taking advantage of the strengths of each sensor.
(4) Flexibility in arithmetic processing environments	Flexibility in arithmetic processing platforms is also an important factor for applying the AP technology to a wider range of fields. As the Kudan Group's technology can work in multifarious arithmetic processing environments, it can be compatible with all kinds of processor designs and thus can speed up calculation processes by optimizing the software according to the kind of processor used (such as a central processing unit (CPU), a digital signal processor (DSP), and a graphics processing unit (GPU)). It can also function in a wide range of system environments through porting a software to major operating systems (such as Linux, Windows, MacOS, iOS, and Android).
(5) Flexibility in using part of the function	Complex fusion with other technologies is necessary for advanced applications of the AP technology. Parts of the function (software modules) of the Kudan Group's technology can be selected so that they are flexibly integrated into customers' existing software. The degree of dependence on processor designs (the degree of abstraction of software) of each part (software module) of the technology's function varies, and therefore it can be optimized flexibly either at a semiconductor level (with a lower abstraction degree) or at a software application level (with a higher abstraction degree).

(2) Group of experts on AP

Kudan has laid a firm technological and business foundation as a group of experts in AP.
Many of Kudan's existing customers are companies in Fortune 2000 that lists global good-standing companies, which indicates that Kudan has been highly acclaimed by world's innovative companies.

(3) Outstanding business achievements and customer awareness

Companies specializing in SLAM and ones whose core technology is SLAM are decreasing in number due to successive mergers and acquisitions by big tech companies.
Under these circumstances, Kudan and Artisense pull far ahead of other companies in terms of the range of technologies that they offer, business results that they have delivered, and customer awareness.

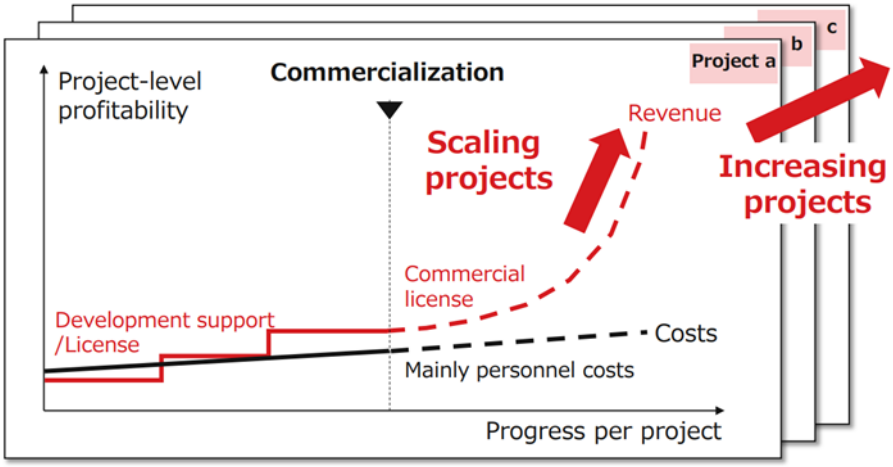
【1-7 Business model】

(1) Acceleration and expansion of customer commercialization

In the evaluation and development phase, Kudan generates revenue from algorithms' customization, addition of new functions, technological consulting services, etc. through joint research and development, as well as by granting the license for the algorithms of Kudan SLAM.

The algorithm license is comprised of the development license and the product license, and the type of license granted will be changed from the development license to the product license according to the progress achieved by each customer with commercialization of its product under development.
Based on such calculations as the cost of a product multiplied by the quantity of products, the company expects that revenue from the product license will rise dramatically as products covered by the license spread out.
Considering that "the quality of the portfolio of projects" is the most important for achieving the above, the company has engaged in the reshuffling of the customer portfolio from the term before the previous term, and produced some achievements.

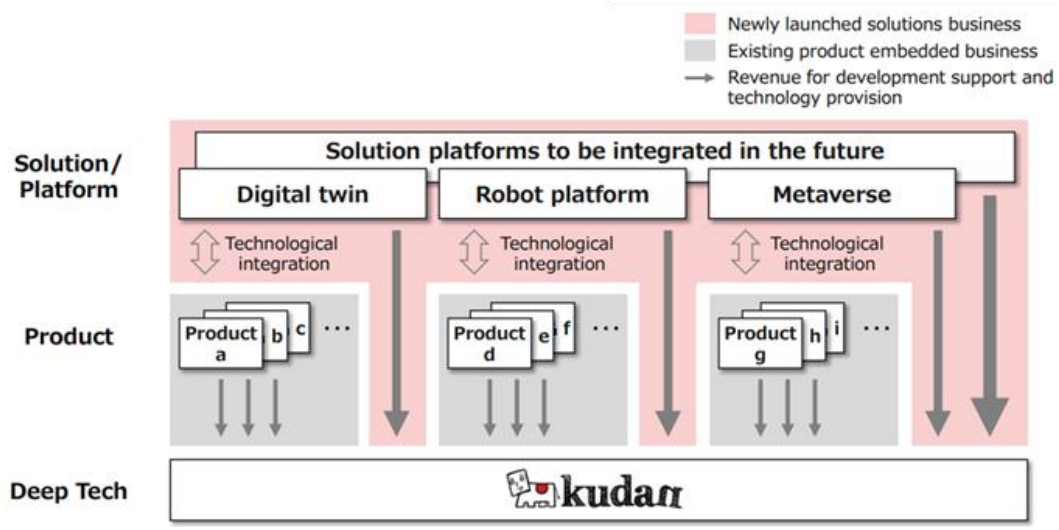
Up until now, the company has been in the "preparation phase," in which they obtain evaluation and development licenses and earn sales according to the progress of the development milestones from support for development in client companies, to achieve a certain level of monetization and growth, but as the provision of products for autonomous driving equipped with Kudan 3D-Lidar SLAM technology started in China (which will be described later), the company will proceed to the "conversion phase," in which the company will receive revenues from product licenses after clients' commercialization and change its revenue structure, and then to the "reaping phase," in which the company will expand sales steeply by accelerating or expanding clients' commercialization and yielding revenues from product licenses, at an accelerated pace.
In addition to expanding its existing AP business, the company aims to enhance deep tech and raise the number of application areas through increased merger and acquisition activity.



(Taken from the reference material of the company)

(2) Operation of the solution business

As the company will proceed from the "preparation phase" to the "conversion phase" to the "reaping phase," it will not only incorporate its technology into individual products, but also concentrate on the provision of new solutions, including the synchronization of multiple products and the expansion of purposes of use based on Kudan technology. Recognizing clients' commercialization as a foothold for the solution business and expecting synergy in the solution business for clients' commercialization, the company aims to increase earning opportunities.
It is assumed that their services will be offered in the fields of digital twins, robot platforms, and metaverse.



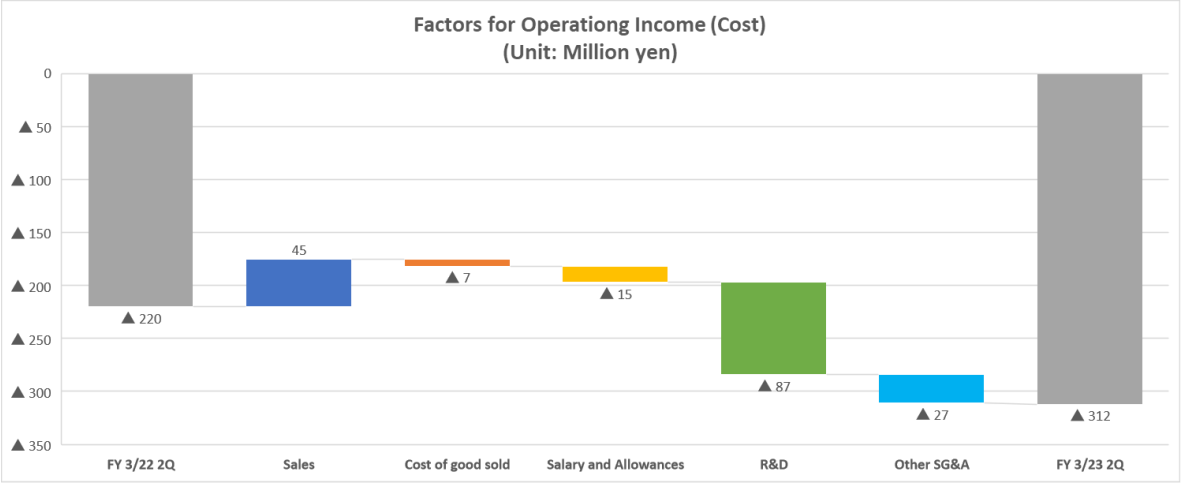
(Taken from the reference material of the company)

2. Second Quarter of the Fiscal Year ending March 2023 Earnings Results

【2-1 Overview of the consolidated results】

	FY 3/22 2Q	Ratio to sales	FY 3/23 2Q	Ratio to sales	YoY
Sales	110	100.0%	155	100.0%	+40.0%
Gross Profit	49	44.7%	86	56.1%	+75.5%
SG&A	270	244.2%	399	257.4%	+47.6%
Operating Income	-220	-	-312	-	-
Ordinary Income	-323	-	-81	-	-
Net Income	-321	-	-84	-	-

*Unit: million yen. Net income is profit attributable to owners of the parent. Hereinafter the same shall apply.



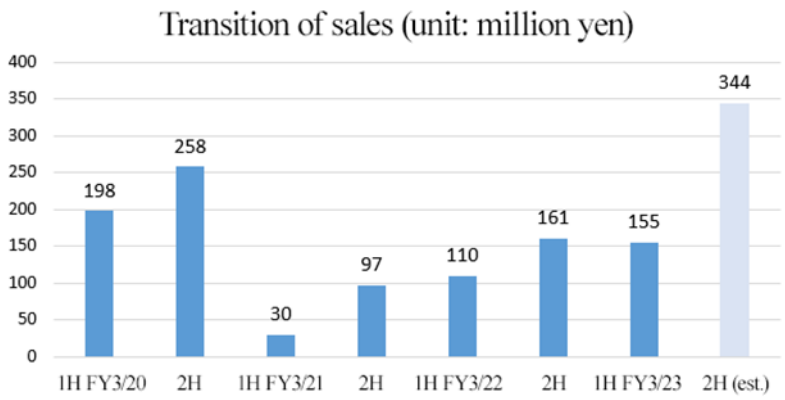
*Created by Investment Bridge based on disclosed material of the company.

*▲ of expense account indicates that the expense has increased.

Sales increased, mainly due to the accumulation and upsizing of evaluation and development projects.

The sales in the second quarter of the term ending March 2023 were 155 million yen, up 40.0% year on year. Sales continued to grow due to the accumulation and upsizing of mainly evaluation and development projects. Operating loss was 312 million yen. Cost of sales and SG&A expenses increased as Artisense became a consolidated subsidiary. The company posted an ordinary loss of 81 million yen. Due to the yen's depreciation, a foreign exchange loss of 7 million yen in the same period of the previous year turned into a foreign

exchange gain of 232 million yen.

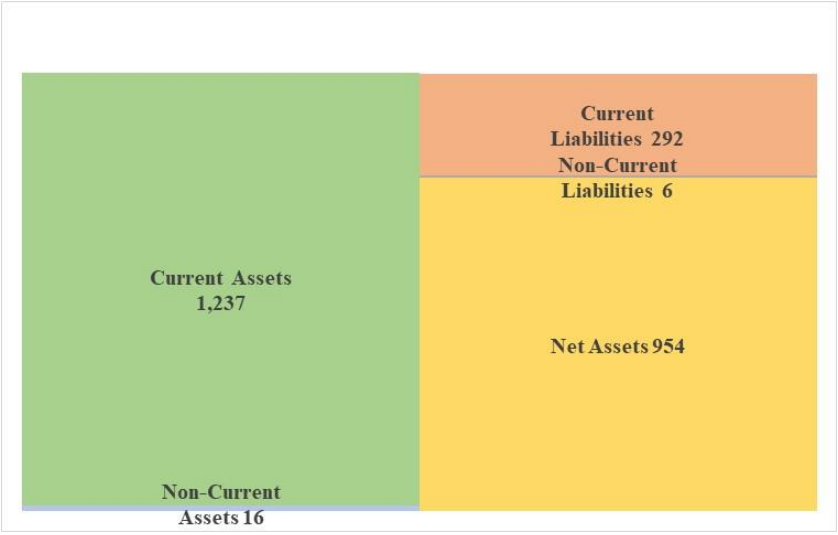


【2-2 Financial standing and cash flows】

◎ Balance sheet indicating major items

	End of Mar. 2022	End of Sep. 2022	Increase/ decrease		End of Mar. 2022	End of Sep. 2022	Increase/ decrease
Current Assets	754	1,237	+483	Current Liabilities	125	292	+167
Cash and deposits	604	1,122	+518	ST Interest-Bearing Debts	0	0	0
Noncurrent Assets	15	16	+0	Noncurrent Liabilities	6	6	0
Tangible Assets	0	0	0	LT Interest-Bearing Debts	0	0	0
Investment, Other Assets	15	16	+0	Total Liabilities	132	299	+167
Investment Securities	0	0	0	Net Assets	637	954	+316
Total Assets	770	1,253	+483	Capital	897	317	-580
				Retained Earnings	-2,382	-3	+2,379
				Total Liabilities and Net Assets	770	1,253	+483

*Unit: million yen



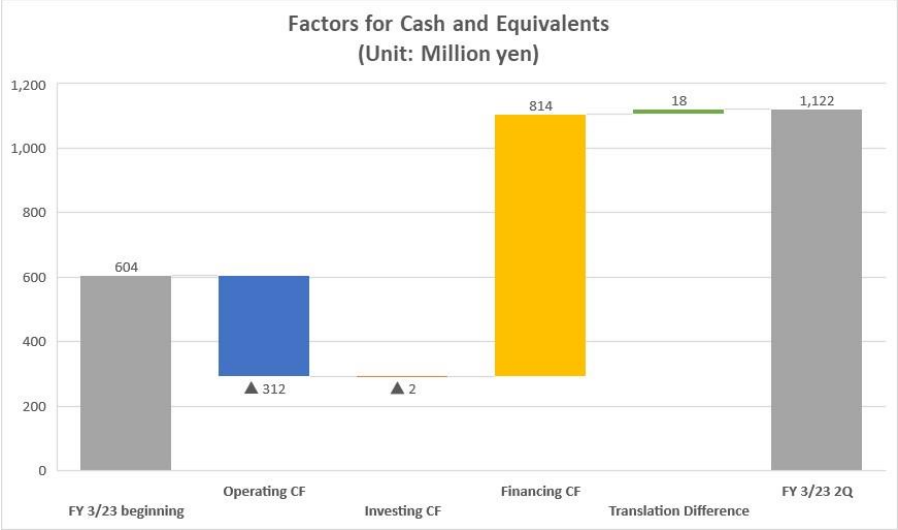
*Created by Investment Bridge based on disclosed material of the company.

Total assets increased 483 million yen from the end of the previous fiscal year to 1,253 million yen due to an increase in cash and deposits.
Net assets increased by 316 million yen to 954 million yen due to an increase in retained earnings.
As a result, the equity ratio decreased by 6.8 points from the end of the previous fiscal year to 76.0%.

◎ Cash Flow

	FY 3/22 2Q	FY 3/23 2Q	Increase/decrease
Operating Cash Flow	-184	-312	-128
Investing Cash Flow	-145	-2	+143
Free Cash Flow	-330	-314	+15
Financing Cash Flow	16	814	+797
Cash and equivalents	918	1,122	+204

*Unit: million yen



*Created by Investment Bridge based on disclosed material of the company.

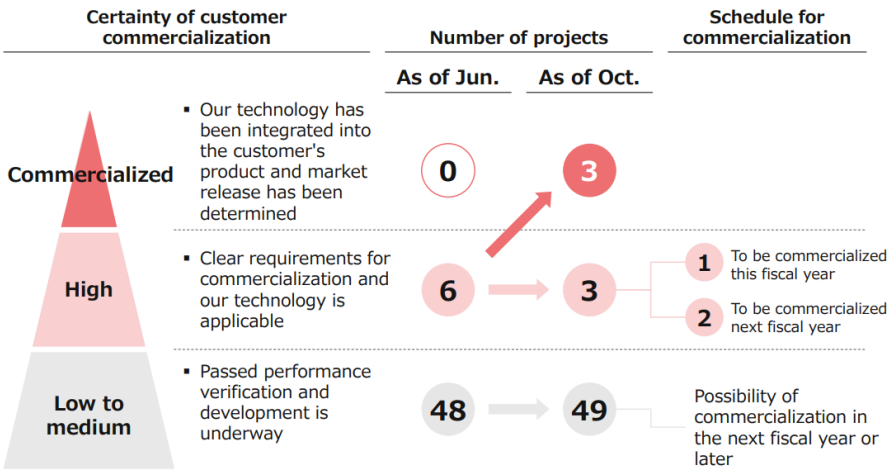
The positive balance in financing CF increased due to proceeds in revenue from stock issuance year on year, etc. The cash position increased.

【2-3 Topics】

(1) Variation in the number of projects and progress & prospects of clients' commercialization

The commercialization of products by clients is progressing steadily.
Following the first project introduced in the previous report (in July 2022, the company's Chinese business partner Whale Dynamic started offering products for autonomous driving that were developed by incorporating Kudan's 3D-Lidar SLAM technology), two products are scheduled to be released by clients in October. We will provide a detailed explanation of the products below.
In August, the expected number of products commercialized by clients this term was revised upwardly from three at the beginning of the term to four.

As shown in the chart below, three projects have already been finalized, and the remaining three promising projects are scheduled to be finalized in the current or next fiscal year.



(Taken from the reference material of the company)

As shown below, there are an increasing number of promising projects for clients' commercialization in the areas of autonomous driving/ADAS, robotics, and mapping.

Highlights of projects accumulated for customers' commercialization

	Company	Overview and progress	Commercialization schedule
Robotics	Intel	Kudan SLAM has been adopted as part of Intel's product for robotics and launched for sale to customers, with hardware-acceleration optimized for the characteristics of Intel's product	Commercialized
	Robotics-related	Completed product implementation, and installation testing is underway with potential customers in preparation for the product release	Short-term
	Major industrial machinery	Started initial development process to introduce spatial location DX solution	Mid-term
	Major telecommunication	Completed PoC and demonstration of autonomous mobile robot combined with 5G	Mid-term
Autonomous driving/ ADAS	TOP5 automotive OEM	Development by cloud implementation to realize large scale maps for autonomous driving is in progress	Mid-term
	Major automotive parts Tier1	Verification for the higher performance of the parking assist system is underway and discussions on the business side are also ongoing	Mid-term
Mapping	UCS	Product implementation completed and has been delivered to multiple customers	Commercialized
	Major telecommunication	Demonstration tests for map base for smart cities are in progress	Mid-term

(Taken from the reference material of the company)

The company mentioned the following three reasons for the steady increase in projects.
① R&D: Adaptation to market needs by adding functions, improving performance, and expanding the technology lineup
For both Visual SLAM and Lidar SLAM, the company is efficiently developing and progressing projects by focusing on development items for which there is a high demand in the target domain and where it is easy to gain a competitive advantage.

By enhancing wheel odometry in KdVisual and improving accuracy in KdLidar, the company is now able to respond to customer projects with more specific product realization timelines.
In addition, the launch of Artisense SLAM has led to further project wins, especially in outdoor robotics projects. Moreover, in robotics, the ease of integration through the Robot Operating System (ROS) allows for a wider range of projects to be handled.

② Business development: Expansion of sales channels and the technology lineup by expanding partners and strengthening relationships

Through partnerships with sensor OEMs, processor OEMs, and technology trading companies, the company has been able to expand its channels for developing projects for which Kudan/Artisense SLAM is a good fit, and is making progress in effectively developing these projects.
It is also possible to develop solutions that combine SLAM and other areas through partnerships and collaborations with engineering companies.

③ Market environment: Increasing market needs for both Visual SLAM and Lidar SLAM
The adoption of Visual SLAM is being accelerated by the increasing number of development projects for autonomous industrial robots and by OEMs which are developing automated transport robots using SLAM with magnetic tape and 2D-Lidar, which are conventional technologies.
In addition, the 3D-Lidar market is maturing due to price reduction, and as a result, the need for 3D-Lidar-based SLAM solutions is increasing.

(2) Clients' commercialization projects

Following the company's Chinese business partner Whale Dynamic's project in July 2022, the commercialization of two other products by clients has been confirmed.

(1) Kudan Visual SLAM was launched as software adopted for the latest version of Intel Edge Insight for AMR platforms
In October 2022, the company announced that Intel Corporation, its strategic technology partner, released its latest Edge Insight, a software platform for autonomous mobile robots (AMR), and they used Kudan Visual SLAM (KdVisual) as commercial Visual SLAM software.

Combining KdVisual with Intel's Edge Insights enables AMR's OEMs and developers to construct a highly reliable and robust AMR that can handle the most demanding tasks faster and more efficiently without sacrificing accuracy or performance.

KdVisual is commercial SLAM software fully adopted for major semiconductor platforms, and Kudan is the world's first company to specialize in this technology area.
Intel's platform provides comprehensive software functions for the elemental technologies for next-generation autonomous driving functions that require a lot of investment and time for robot manufacturers to develop in-house, among which Kudan's mapping technology is used as a core module.
In addition, the SLAM software was customized specifically for the interlocking Intel hardware chip to achieve a significant improvement in SLAM performance.
As a result, the hurdles for commercial development for robot manufacturers that use Intel products have been greatly reduced, enabling the practical application of efficient and rapid autonomous driving.

(2) UCS Co., Ltd., a distributor in South Korea, launches handheld mapping products equipped with Kudan Lidar SLAM
Also in October 2022, UCS Co., Ltd., a South Korean Ouster distributor, and a mapping solution provider, announced that it had developed and started selling a handheld mapping device equipped with Kudan 3D-Lidar SLAM.

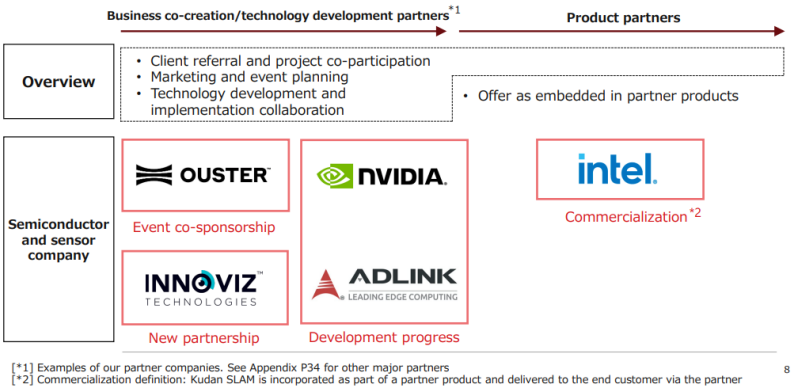
Kudan has been working with UCS to develop handheld devices using the Ouster lidar and Kudan 3D-Lidar SLAM since the beginning of this year. After several prototypes, and field testing, optimization, and pre-marketing of the product, the device has finally been launched.
The device uses Ouster Lidar (the model is flexible) and its built-in IMU without any additional sensors such as an external IMU and GNSS, which enables this device to be price competitive in the market.

UCS expects significant demand for a simple and affordable mapping device for multiple applications ranging from forestry, roads, and buildings, to the mapping and inspection of indoor facilities. Target customers require accurate point clouds, but do not need survey-grade accuracy and prefer affordability and simplicity.
The feedback from pre-marketing activities was overwhelmingly positive and UCS has secured several purchase orders from their customers for applications such as railway infrastructure inspection, and university research.

In the future, the company plans to respond to the high market demand for simple and affordable mapping solutions on a global level.

(3) Development of partnerships

Starting with the above-mentioned product release by Intel, it is expected that the oligopolization of the technologies by major companies that are responsible for the industry's ecosystem will further accelerate.
Until now, Kudan has taken the lead in partnerships with major semiconductor and sensor companies, and it will further expand and deepen its partnerships to standardize technologies in the industry. The company will expand the number of product partners like Intel to establish its position in the foundation of the technology ecosystem as an underlying technology company and aim to expand the sales channel of its technologies.



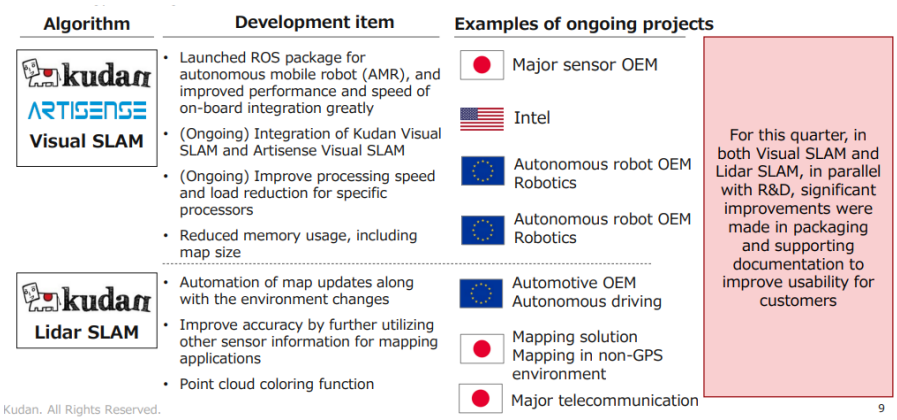
(Taken from the reference material of the company)

(4) Progress of research and development

Kudan SLAM technology's performance and the speed of its integration into clients' products have improved significantly, through the enhancement of joint development with semiconductor and sensor manufacturers, the release of in-house packages for autonomous robots, and the strengthening of customer development support.

In addition, the integration of Visual SLAM technologies between Kudan and Artisense is progressing as planned, and they have started providing some customers with them for evaluation.
Expanding the provision of these technologies will enable them to receive orders for projects in a wider range of applications, such as outdoor environments and high-speed movement, and the company is making steady progress in building a foundation for the expansion and acceleration of the use of Kudan technology, including clients' commercialization.

Major R&D and business development in the growth areas are as follows.



(Taken from the reference material of the company)

3. Fiscal Year ending March 2023 Earnings Forecasts

【3-1 Earnings forecasts】

	FY 3/22	Ratio to sales	FY 3/23 Est.	Ratio to sales	YoY	Progress rate
Sales	271	100.0%	500	100.0%	+83.8%	31.0%
Operating Income	-433	-	-350	-	-	-
Ordinary Income	-681	-	-300	-	-	-
Net Income	-2,237	-	-315	-	-	-

*Unit: million yen. The forecasts were those released by the company.

No change in the earnings forecast; expect a significant increase in revenue due to accumulation and larger scale of mainly evaluation and development projects.

There is no change in the earnings forecast. In the term ending March 2023, sales are expected to increase 83.8% year on year to 500 million yen. The company also expects significant sales growth in this term, mainly due to the accumulation and upsizing of evaluation and development projects.

In addition to licensing and development support income for evaluation and development projects, product licensing revenues will contribute to sales in the future due to the progress of clients' commercialization. Still, its full impact will start from the next term.

The company is projected to post an operating loss of 350 million yen and an ordinary loss of 300 million yen. The costs of Artisense, which were considered for only three months in the previous term, will be included for the full year this term, so the cost of sales and SG&A will augment year on year, but the company will improve its cost structure by the end of the term.

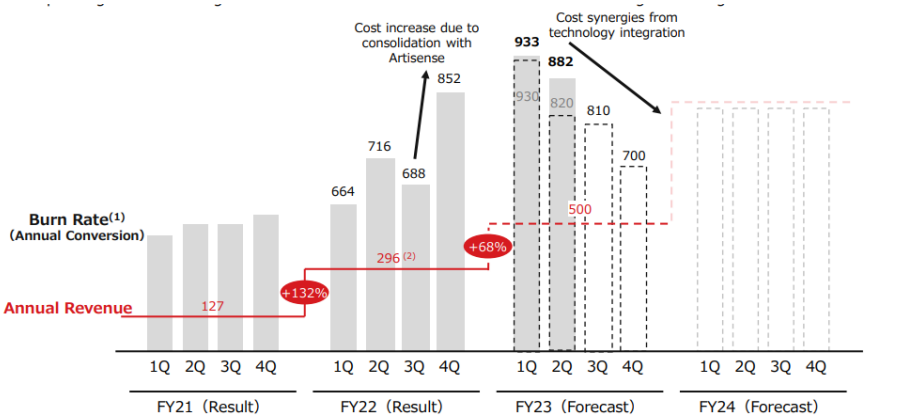
As non-operating revenues, the company is expected to receive R&D subsidies in the U.K. and Germany.

(Regarding the improvement in the cost structure)

By the fourth quarter of the term ending March 2023, the loss-making structure will be improved significantly, due to the cost synergy through the technological integration with Artisense Corporation (significant streamlining of development through the sharing of architecture, modules, etc.), and the company plans to secure a revenue structure for earning profit.

Due to the sharp depreciation of the yen, costs have exceeded the budget, but the above policy is progressing as expected.

Costs may increase more than initially expected, because of the acceleration of business investment due to future exchange rate trends and financing. However, it is expected that the company will continue to improve its profit structure.



(1) Annual costs required for business activities, calculated by each quarterly cost times four. Calculated by deducting R&D subsidy income from total cost of sales, SG&A expenses, non-operating expenses, extraordinary losses, income taxes, etc. (adjusted for seasonal variations, foreign exchange losses and other transitory costs). Prior to FY22/3Q before Artisense was consolidated, Artisense-related costs such as impairment losses and share of loss (income) of entities accounted for using equity method were deducted and only Kudan's costs were totaled. (2) Revenue adjusted for the impact due to accounting standards change

(Taken from the reference material of the company)

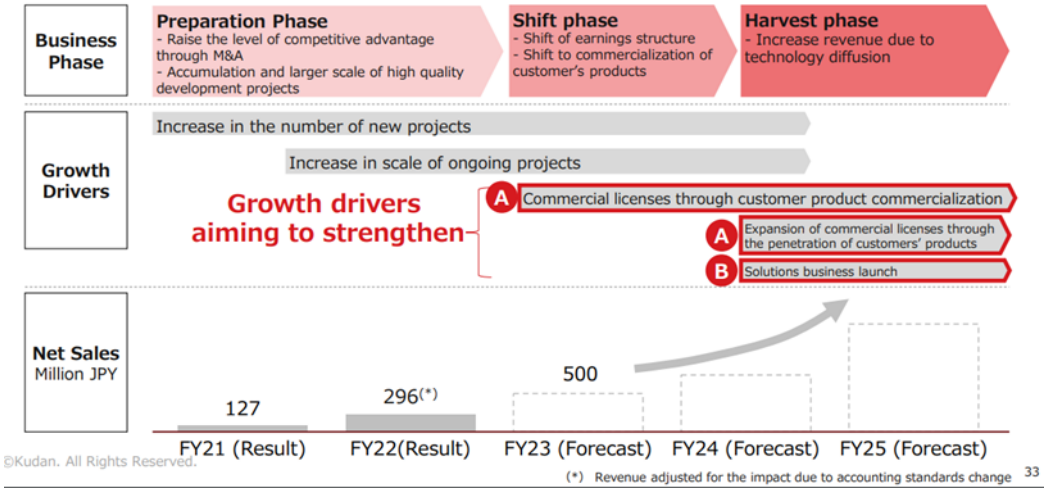
【3-2 Outlooks and initiatives】

In the term ending March 2023, the company will maintain the portfolio composed of mainly evaluation and development projects, grow sales by accumulating and enlarging projects, and shift to a revenue structure for earning profit while exerting cost synergy through the acquisition of Artisense Corporation as a subsidiary.

The company will accelerate sales growth from all aspects of regions (Asia and other foreign countries), products (support for development and packaged products directly linked to clients' commercialization) and channels (sales partners), shift to a revenue model by realizing clients' commercialization, and establish a base for expanding revenues from the term ending March 2024.

4. Growth Strategy

There is no change to the policy of shifting to a revenue structure for earning profit and a revenue model through clients' commercialization, to expand revenues from the term ending March 2024.
By strengthening the growth driver through the switch from "monetization at the project level" to "monetization at the business level," the company aims to shift from "the preparation phase" to "the conversion phase" to "the reaping phase".
They are expected to earn revenues according to the progress of clients' commercialization. At the time of the start of commercialization, they will earn revenues of several million to tens of millions of yen per project, and revenues of hundreds of millions of yen per project in parallel with the growth of product sales.



(Taken from the reference material of the company)

To implement this growth strategy, the company issued share acquisition rights in July 2022.

(Outline of financing)
Financing is based on Tranches 1, 2, and 3 of share acquisition rights. Their outlines, conditions, etc. are as follows.

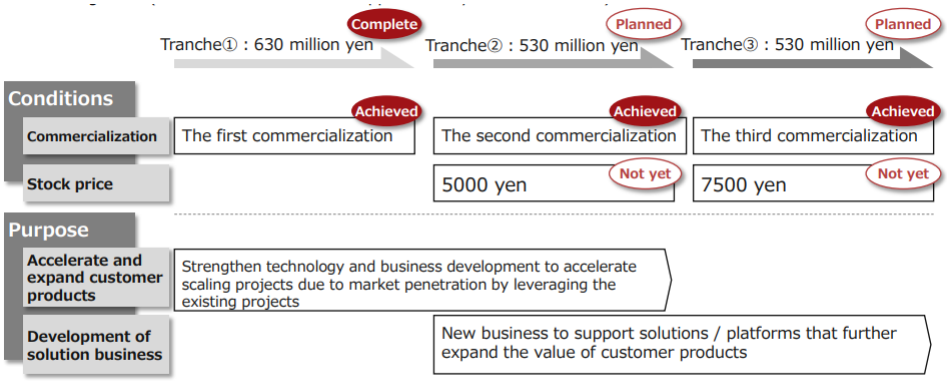
Share acquisition right	Amount to be procured	Condition
Tranche 1	About 530 million yen	Initial exercise price: 2,069 yen
Tranche 2	About 530 million yen	Initial exercise price: 5,000 yen. The right can be exercised only after the client's commercialization has been announced once or more while the base share price is 5,000 yen or higher.
Tranche 3	About 530 million yen	Initial exercise price: 7,500 yen. The right can be exercised only after the client's commercialization has been announced twice or more while the base share price is 7,500 yen or higher. (A total of two, combined with the first one of Tranche 2)

For Tranche 1, the company will issue share acquisition rights for accelerating the commercialization of Whale Dynamic in China and clients.
For Tranches 2 and 3, the number of announcements of commercialization of clients' products based on Kudan's technologies after the commercialization of Whale Dynamic in China is included in the condition, because the actualization of clients' commercialization is expected to lead to the demand for funds for growing businesses and enterprises.

Even after the exercise of share acquisition rights, dilution rate is 5.29%, thanks to the stepwise fund procurement in parallel with growth. Since the number of shares is fixed, dilution rate will not rise. Due to the stepwise setting of share price conditions, it is possible to procure funds while minimizing dilution for maintaining shareholder value.

(Progress)
-Tranche 1
Due to the rise in stock price after its launch, the company raised 630 million yen, which is about 20% more than the initially planned amount of 530 million yen.
The funds raised will be used to accelerate commercialization further and promote business developments to increase the size of projects.

-Tranches 2 and 3
The company satisfied the clients' commercialization conditions for the Intel and USC projects. Still, it did not meet the stock price condition that states that the base price should be 5,000 yen or higher for Tranche 2 and 7,500 yen or higher for Tranche 3, so not all exercise conditions were satisfied.
In the future, after satisfying the stock price condition of 5,000 yen for Tranche 2 and 7,500 yen for Tranche 3, the company will raise an estimated 530 million yen for each of the Tranches. By doing so, the company will secure further growth funds to strengthen technology and business development to accelerate the horizontal expansion of projects and increase the size of projects through product dissemination and start new businesses that support solutions and platforms that further increase the value of clients' commercialization. Going forward, the maximum dilution rate will be about 2%.



(Taken from the reference material of the company)

5. Conclusions

Tranches 2 and 3 met the conditions for clients' commercialization through the Intel project and the USC project, but did not meet the stock price condition of a base price of 5,000 yen or higher for Tranche 2 and 7,500 yen or higher for Tranche 3. Thus, it did not fulfill all the exercise conditions.
The daily fluctuation in stock price is a matter of concern, for checking whether they can meet the stock price conditions. The progress in essential business development, such as further expansion and acceleration of clients' commercialization, is a major factor in the rise in stock price. We will also continue to pay attention to future product releases and progress in research and development.

<Reference: Regarding Corporate Governance>

◎ Organizational form and compositions of directors and auditors

Organizational form	Company with audit and supervisory committee
Directors	8 directors, including 4 outside ones
Auditors	-

◎ Corporate Governance Report
Last updated in June. 24, 2022

<Basic Policy>
Our company recognizes that it is indispensable to establish corporate governance, in order to improve our corporate value, maximize the profits of shareholders, and foster good relationships with stakeholders.
Under this recognition, the Managing Directors, other Directors, and employees of our company will strive to tighten corporate governance by understanding their respective roles and developing and operating internal control systems.

<Reasons for not following the principles of the corporate governance code>
We follow all the basic principles of the corporate governance code.