BRIDGE REPORT Bridge Salon

Kudan Inc. (4425)	

Corporate Information

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

Stock Information

Share Price	Shares Outstanding		Total market cap	ROE Act.	Trading Unit
¥4,020	7,736,000 shares		¥31,098 million	-135.3%	100 shares
DPS Est.	Dividend yield Est.	EPS Est.	PER Est.	BPS Act.	PBR Act.
0.00	-	-	-	¥189.32	21.2x

*The share price is the closing price on November 29. Shares Outstanding, DPS, and EPS were taken from the financial report for the second quarter of FY 3/22. ROE and BPS were taken from the previous fiscal year.

Earnings Trend

Fiscal Year	Sales	Operating Income	Ordinary Income	Net Income	EPS	DPS
Mar. 2018 (Actual)	204	-3	4	3	0.57	0.00
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 (Estimate)	300～350	-	-	-	-	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. Only for sales, the estimated range was indicated, considering the unclear outlook for the business environment and the uncertainties over the progress of existing and new transactions.

This report briefly describes Kudan Inc., the financial results for the second quarter of term ending March 2022, growth strategies, and earnings forecasts.

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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 in 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. The company will keep developing products through the projects of clients so far, disseminate its technologies in the market by distributing clients' products, and increase revenues from commercial licenses, with the aim of expanding profit considerably.**

- **In the second quarter of the term ending March 2022, sales increased 262.7% YoY to 110 million yen. Sales are recovering owing to the expansion of the lineup of technologies for Lidar SLAM and Artisense SLAM and the effects of the customer portfolio replacement implemented since the previous term, which has led to an increase of orders and progress in the development phase of existing projects. An operating loss of 220 million yen was posted. SG&A expenses increased 7.8% YoY to 270 million yen due to the expansion of the system on a global scale. An ordinary loss of 323 million yen was posted. The company recorded an investment loss on equity method of 107 million yen in non-operating expenses due to the inclusion of Artisense's profit and loss in the accounting period.**

- **Against the backdrop of the steady progress of the phased corporate integration of Artisense, the company decided to move up the date of the third closing, which was scheduled to be conducted by December 2022. The company will acquire 62% of the shares at an acquisition price of 1.79 billion yen, making it a wholly owned subsidiary. 490,000 common shares of Kudan will be allocated to third parties as part of the compensation. For accounting purposes, Artisense will become a wholly owned subsidiary in October 2021, and all sales and expenses of Artisense will be recorded in Kudan's consolidated financial statements. The company aims to accelerate and expand sales promotion by accelerating the management integration.**

- **The full-year earnings forecasts are unchanged. For the term ending March 2022, sales are estimated to be 300 to 350 million yen. Sales are expected to grow, as the recent recovery trend will continue mainly thanks to the increase of projects for developing clients' products. The estimate is a sales range, because there are uncertainties over the progress of existing projects and the increase of new projects at each foothold around the world. The estimated profit is still to be disclosed, because the company will conduct investment swiftly and flexibly for business integration with Artisense and recruitment, while considering the impact of COVID-19, the expansion of business development, etc.**

- **By making Artisense a subsidiary ahead of schedule, Kudan's already established position as a global leading-edge company, and competitive advantage will be further strengthened at an early stage. The number of projects with a high probability of being commercialized by customers has been steadily increasing, and if everything goes according to plan, the company expects to release products in the current and next terms.**

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 deep tech that has 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 future 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. with the aim of extending 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 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.
Consisting of three inside directors, Managing Director & CEO Daiu Ko, who joined the company after working for Toyota Motor Corporation and McKinsey & Company, Managing Director Tomohiro Ohno, and Director Ken Iizuka, who entered the company after working at Ernst & Young ShinNihon LLC, 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 to "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 needs 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.

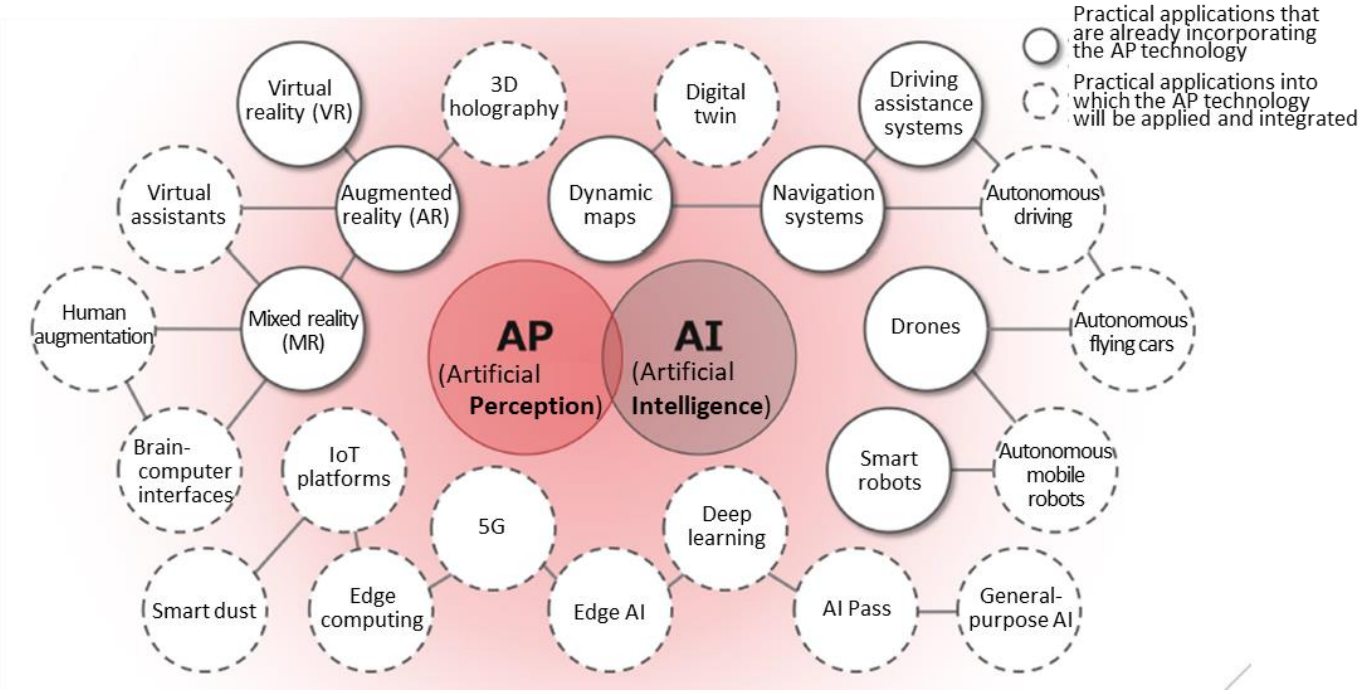
In addition, the impact of the spread of COVID-19 has resulted in soaring demand for saving labor and working remotely for operations that require neither human interaction nor group work in all the industries. The growth of demand for automation technology, such as robotics, autonomous driving, and 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 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 use of IoT and AI is estimated at **132 trillion yen in 2030**. The number of people in employment in 2030 when 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 when 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 that 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.

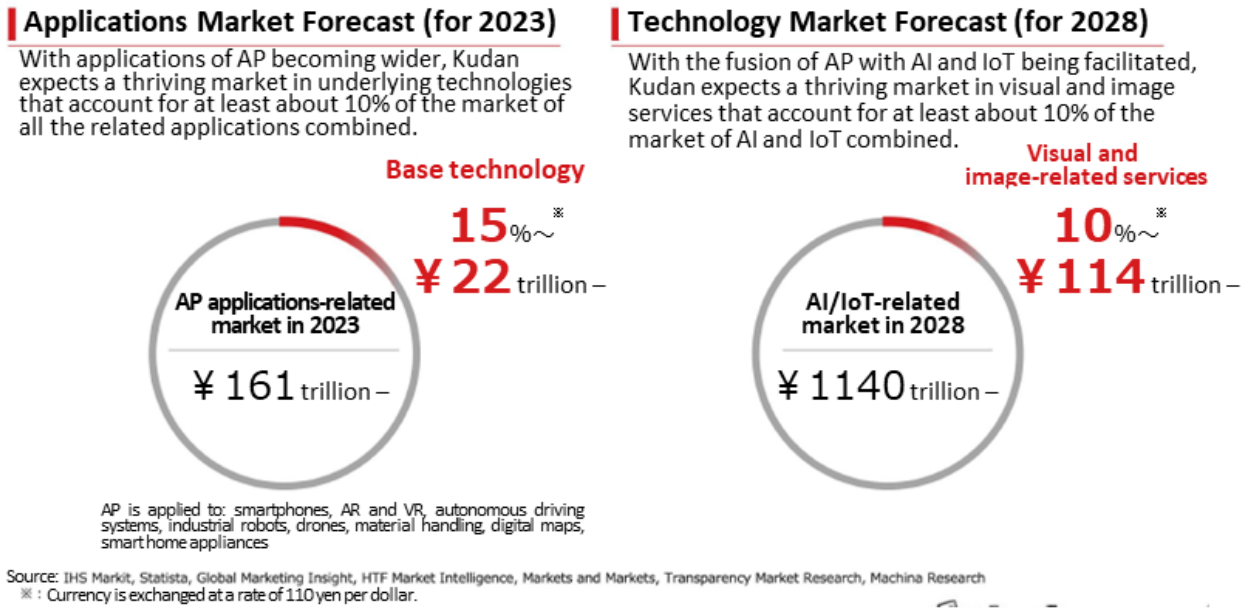
*Created with reference to "Reference material 2: Case studies for estimating the economic impact of advanced technology" used at the 10th meeting for discussing new governance models for realizing Society 5.0 as posted on METI's website. The red and bold parts were provided by Investment Bridge Co.,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

As the AP technology can be applied and integrated into myriad industries in which it underpins a wide variety of advanced technologies besides the aforementioned practical applications that have already incorporated AP, it is predicted that the AP technology will be implemented in society at a higher-than-expected speed.



(Taken from the reference material of the company)

The company expects that the applications of AP and fusion of it with AI and IoT will result in strong markets of both applications and technology.



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【1-4 Business content】

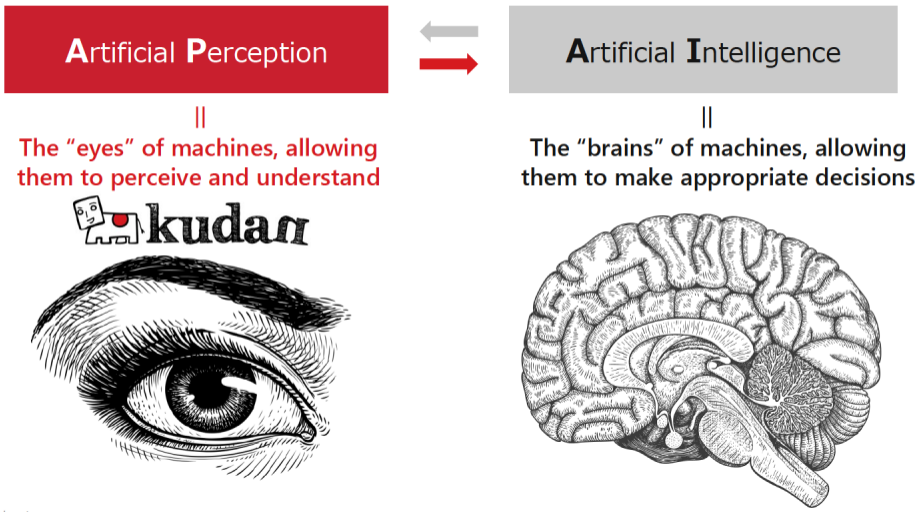
Kudan has issued a license for Kudan SLAM, a software for integrating such algorithms as SLAM, that is the mission-critical technology of AP, into hardware, and grants it to customers.

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 that is the brain with which machines can make decisions and AP, one of the advanced technologies that acts 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.

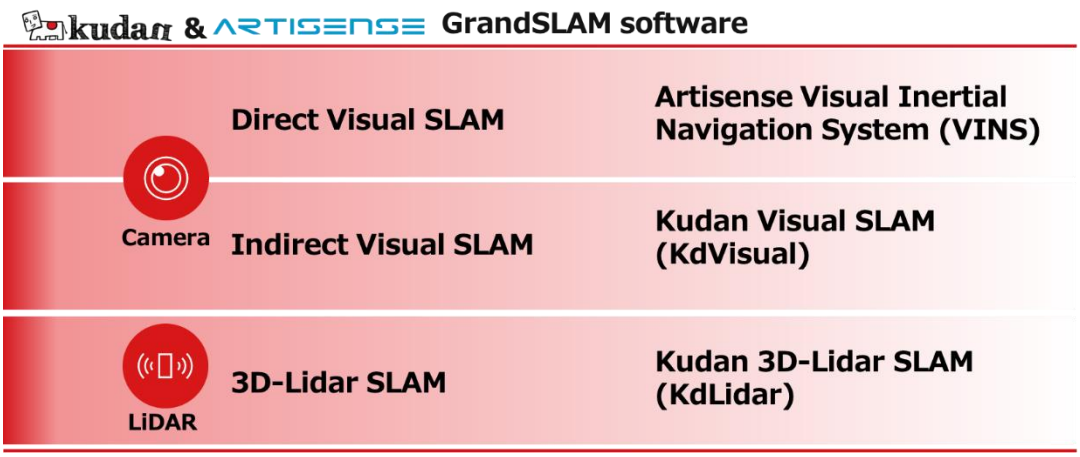
<What is SLAM?>

Simultaneous localization and mapping (SLAM) are a computer-based technology that draws a three-dimensional map while localizing a moving body in a reality environment.
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).

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.



(Taken from the reference material of the company)

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>

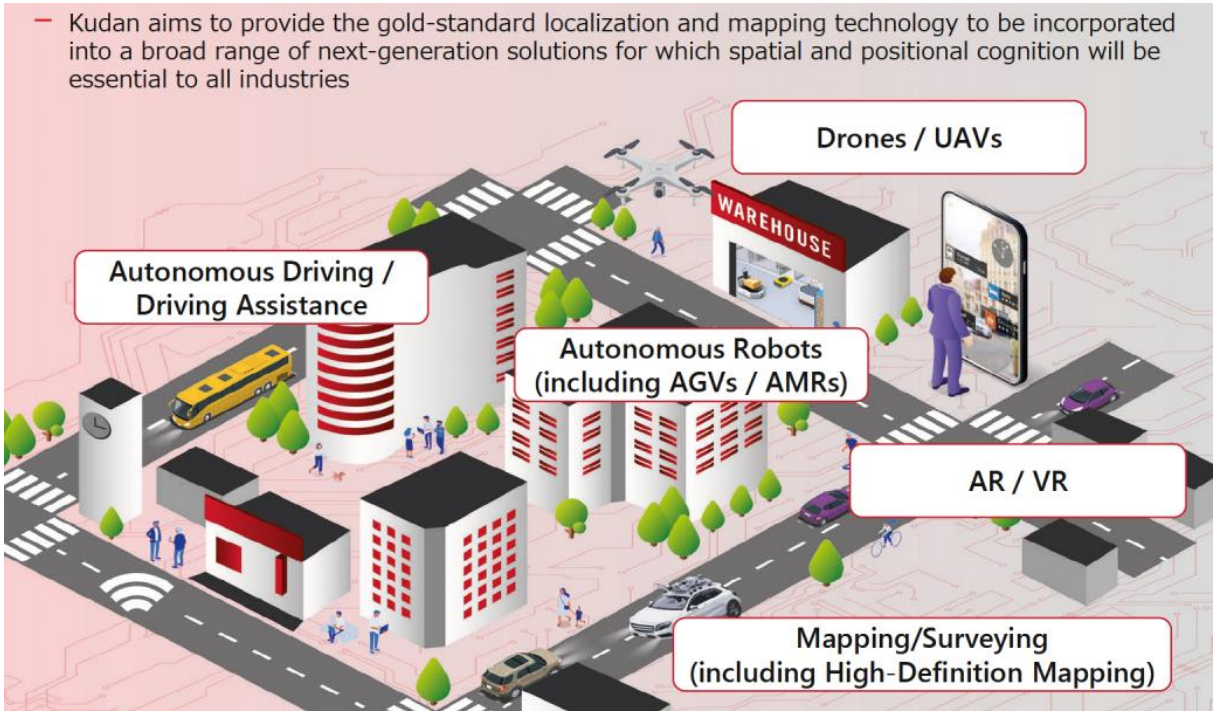
Using one of the existing technologies called computer vision (a set of base technologies of sensor and image processing mainly on a two-dimensional basis) as the foundation after reconstructing it, Kudan has developed its own unique AP technology.

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.

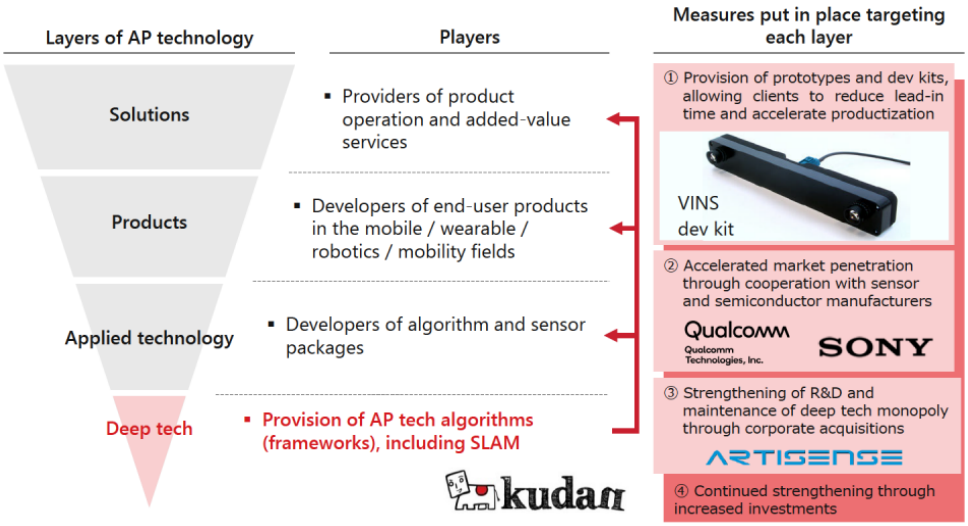
It will also be required for spatial perception in AR and VR that will serve as user interfaces of next-generation computers.
In addition, the technology will be applied to an extremely wide range of purposes as the base technology for next-generation digital maps, dynamic maps (a dynamic mapping system 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.

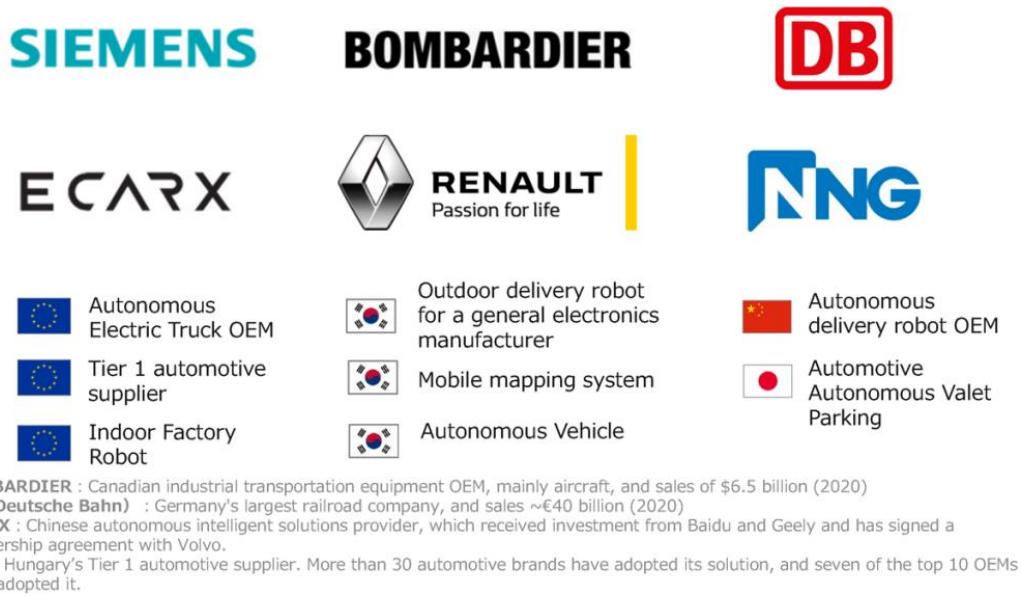
In addition, the technological collaboration between the two companies is expected to solidify their footing by securing IP (intellectual property) for future technologies, and synergistically improve performance by complementing the technologies in which each company excels, thereby realizing advanced 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 backdrop, the company decided to conduct the third closing, which had been scheduled to be conducted by December 2022, from October 26 to December 24, 2021.

The company will acquire 62% of the shares at an acquisition price of 1.79 billion yen, making it a wholly owned subsidiary. 490,000 shares of Kudan common stock will be allocated to third parties as part of the compensation.

The company aims to accelerate and expand sales promotion by accelerating the management integration.

【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 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

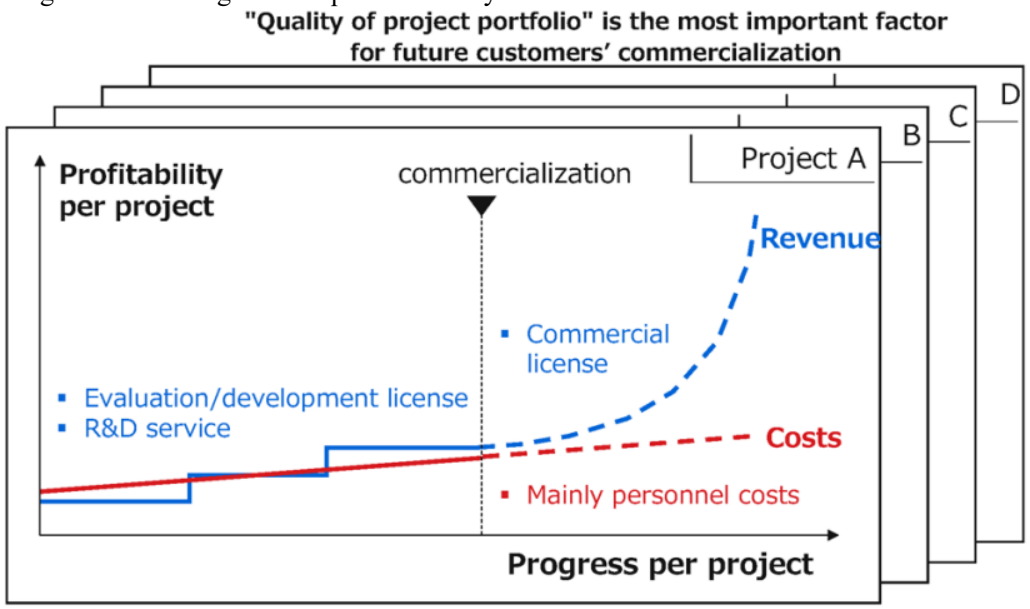
Companies specializing in SLAM and ones whose core technology is SLAM are decreasing in number due to successive mergers and acquisitions by big tech companies.
Under these circumstances, Kudan and Artisense pull far ahead of other companies in terms of the range of technologies that they offer, business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

【1-7 Business model】

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.

At present, almost all the customer projects are in the same phase, and the company is in the preparation stage, focusing on acquiring and continuing projects that are expected to achieve commercialization and expand the scale of sales in the future.

The algorithm license is comprised of the development license and the commercial license, and the type of license granted will be changed from the development license to the commercial 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 commercial license will rise dramatically as products covered by the license spread out.
Although a certain level of growth can be expected in sales based on the progress of development milestones from evaluation and development licenses and customer development support, the company's primary goal is to contribute to all next-generation industries through the social implementation of artificial perception technology, and to achieve a dramatic increase in sales through commercial licensing revenue. For this purpose, the company believes that the quality of the project portfolio is the most important factor, and has been working on replacing the client portfolio since the previous term.
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. Second quarter of Fiscal Year ending March 2022 Earnings Results

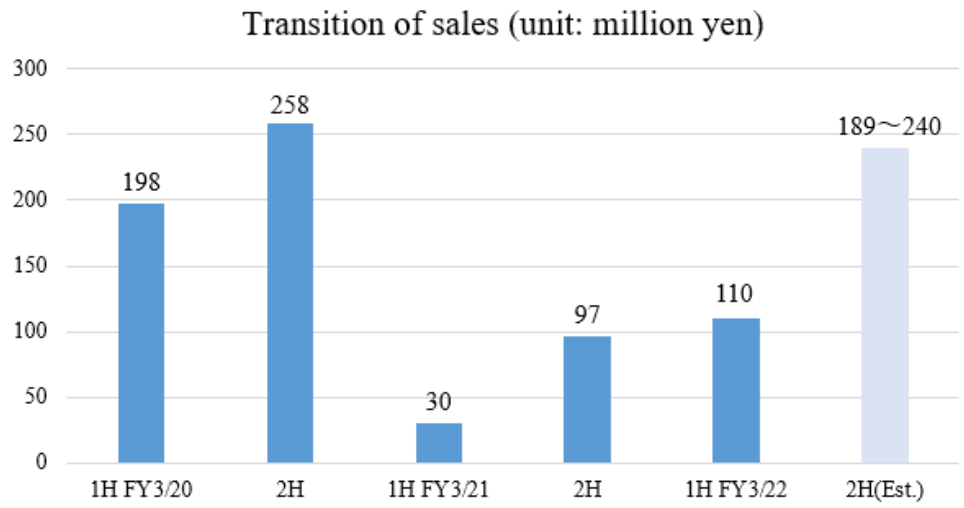
【2-1 Overview of the consolidated results】

	2Q of FY 3/21	Ratio to sales	2Q of FY 3/22	Ratio to sales	YoY
Sales	30	100.0%	110	100.0%	+262.7%
Gross Profit	12	40.7%	49	44.7%	+298.8%
SG&A	250	821.8%	270	244.2%	+7.8%
Operating Income	-238	-	-220	-	-
Ordinary Income	-220	-	-323	-	-
Net Income	-220	-	-321	-	-

*Unit: million yen

Sales are recovering due to increased revenue, expansion of project orders, and progress in the development phase of existing projects

In the second quarter of the term ending March 2022, sales increased 262.7% YoY to 110 million yen. Sales are recovering owing to the expansion of the lineup of technologies for Lidar SLAM and Artisense SLAM and the effects of the customer portfolio replacement implemented since the previous term, which has led to an increase of orders and progress in the development phase of existing projects. An operating loss of 220 million yen was posted. SG&A expenses increased 7.8% YoY to 270 million yen due to the expansion of the system on a global scale. An ordinary loss of 323 million yen was posted. The company recorded an investment loss on equity method of 107 million yen in non-operating expenses due to the inclusion of Artisense's profit and loss in the accounting period.



【2-2 Financial standing and cash flows】

◎ Balance sheet indicating major items

	End of Mar. 2021	End of Sep. 2021	Increase/ decrease		End of Mar. 2021	End of Sep. 2021	Increase/ decrease
Current Assets	1,359	1,020	-339	Current Liabilities	81	72	-9
Cash and deposits	1,230	918	-312	ST Interest-Bearing Debts	-	-	-
Noncurrent Assets	180	198	+17	Noncurrent Liabilities	-	-	-
Tangible Assets	0	0	0	LT Interest-Bearing Debts	-	-	-
Investment, Other Assets	180	198	+17	Total Liabilities	81	72	-9
Investment Securities	1	0	-1	Net Assets	1,458	1,147	-311
Total Assets	1,540	1,219	-321	Capital	1,620	21	-1,599
				Retained Earnings	-1,755	-467	+1,288
				Total Liabilities and Net Assets	1,540	1,219	-321

*Unit: million yen

Total assets decreased 321 million yen from the end of the previous fiscal year to 1,219 million yen due to a decrease in cash and deposits.
Net assets decreased by 311 million yen to 1,147 million yen due to a decrease in quarterly comprehensive income.
As a result, the equity ratio decreased by 0.3 points from the end of the previous fiscal year to 94.1%.

◎ Cash Flow

	2Q of FY 3/21	2Q of FY 3/22	Increase/decrease
Operating Cash Flow	-91	-184	-92
Investing Cash Flow	-476	-145	+330
Free Cash Flow	-568	-330	+238
Financing Cash Flow	1,770	16	-1,753
Cash and equivalents	1,699	918	-781

*Unit: million yen

The positive balance in financing CF narrowed due to a decrease in revenue from stock issuance year on year. The cash position declined.

【2-3 Topics】

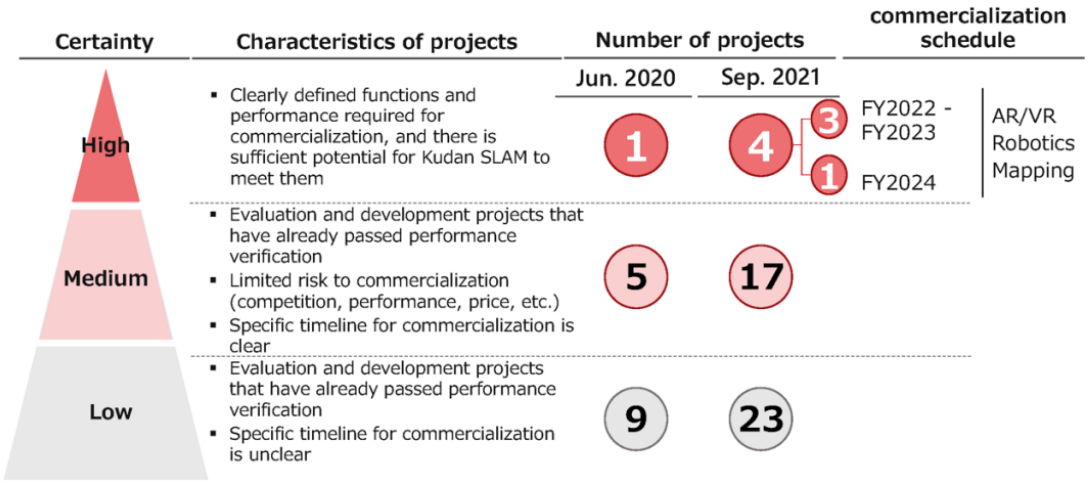
(1) Artisense becomes a wholly owned subsidiary

As mentioned above, against the backdrop of the steady progress of the phased corporate integration, the third closing, which was scheduled to take place by December 2022, will be conducted from October 26 to December 24, 2021.
The company will acquire 62% of the shares at an acquisition price of 1.79 billion yen, making it a wholly owned subsidiary. 490,000 common shares of Kudan will be allocated to third parties as part of the compensation.
For accounting purposes, Artisense became a wholly owned subsidiary in October 2021, and all sales and expenses of Artisense will be recorded in Kudan's consolidated financial statements.
In line with the amortization of goodwill from the Phase 1 and Phase 2 share acquisitions in the term ended March 2021, the company is looking at the possibility of recording an R&D investment expense (impairment loss) from the third quarter of the term ending March 2022. In this case, the company believes that future goodwill amortization will be reduced and the profit contribution from sales expansion synergies will become more evident.
In the medium to long term, the company intends to accelerate and expand sales promotion by accelerating the business integration.

(2) Trend of the number of projects and prospects for commercialization by customers

Kudan has provided support in multiple projects for both Visual SLAM and Lidar SLAM to accelerate the incorporation of SLAM functionality into products and solutions under development by customers. As a result, the development of products has become more accelerated and more certain.

From the end of June 2020 to the end of September 2021, which is before Artisense became a group company, the total number of projects that have passed performance verification and are continuing toward customer commercialization increased from 15 to 44.
Of these, four projects have a high probability of commercialization (three of which are expected to be commercialized between the term ending March 2022 and the term ending March 2023, and one is expected to be commercialized in the term ending March 2024).
In addition, about 20 projects that are expected to increase the probability of commercialization in the future are underway.



(Taken from the reference material of the company)

As shown below, the number of promising projects for commercialization of customers' products is increasing in the areas of automated driving, ADAS, AR/VR, robotics, and mapping.

Highlights of projects accumulated for customers' commercialization

Market	Company	Algorithm	Overview
Autonomous driving	TOP5 automotive OEM	kudan Lidar	Use of KdLidar in the project on urban operation and sensor cost reduction in the field of autonomous driving
	Major engineering	ARTISENSE Visual	Conducted evaluation and development of the use of ArtiSLAM for vehicle positioning in autonomous truck operation in factories and plants
ADAS	Major automotive Tier1	kudan Visual	In progress of evaluation and development of driver assistance functions using KdVisual with cameras installed in commercial vehicles
AR/VR	Major medical device OEM	kudan Visual	In progress of final evaluation and the integration of KdVisual into medical AR headset
	Major telecommunication	ARTISENSE Visual	Conducted the development to create a solution platform using AR in various locations
Robotics	Major telecommunication	kudan Visual	In progress of developing a platform that embeds KdVisual and cooperative use of various robots
	Autonomous delivery robot OEM	ARTISENSE Visual	In progress of final evaluation of ArtiSLAM implementation, including integration, for positioning of outdoor delivery robots
Mapping	Mapping provider	kudan Lidar	In progress of KdLidar being integrated into a solution that enables mapping in non-GPS environments

(Taken from the reference material of the company)

The company mentioned the following three reasons for the increase of 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.

(3) Selecting the new market segment Growth Market
In July 2021, the company received a notice from the Tokyo Stock Exchange (TSE) on the results of the primary judgment regarding compliance with the listing maintenance criteria in the new market category, and confirmed that it complies with the listing maintenance criteria for the Growth Market in the new market category. In response to this, in November 2021, the company decided to select the Growth Market as the market segment after the implementation date of the new market segmentation and apply for it to the Tokyo Stock Exchange.
The company will now proceed with the prescribed procedures related to the application for the selection of the new market segment according to the schedule set by the Tokyo Stock Exchange.

3. Fiscal Year ending March 2022 Earnings Forecasts

【3-1 Earnings forecasts】

	FY 3/21	FY 3/22 Est.	YoY
Sales	127	300–350	+173–+223
Operating Income	-451	-	-
Ordinary Income	-1,575	-	-
Net Income	-1,608	-	-

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

There is no change in earnings forecasts. Sales are expected to increase with continuous recovery trend of its footing, centered on expanding projects for commercialization by customers.

Sales are estimated to be 300 to 350 million yen.

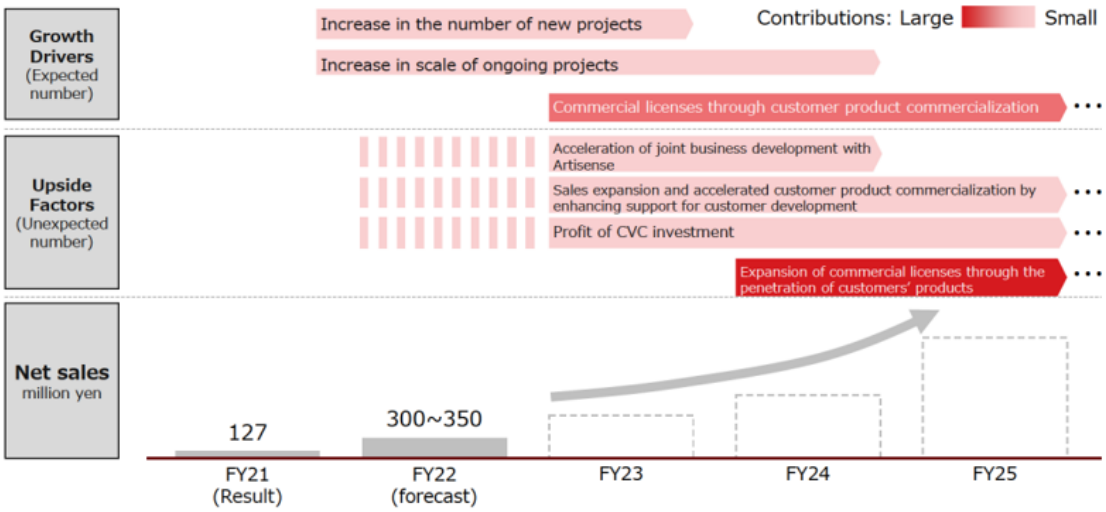
The estimate is a sales range, because there are uncertainties over the progress of existing projects and the increase of new projects at each foothold around the world, as COVID-19 is still expanding mainly in overseas.

The estimated profit is still to be disclosed, because the company will conduct investment swiftly and flexibly for business integration with Artisense and recruitment, while considering the impact of COVID-19, the expansion of business development, etc.

【3-2 Outlooks and initiatives】

The recent recovery trend is thought to continue mainly thanks to the increase of projects for developing clients' products.

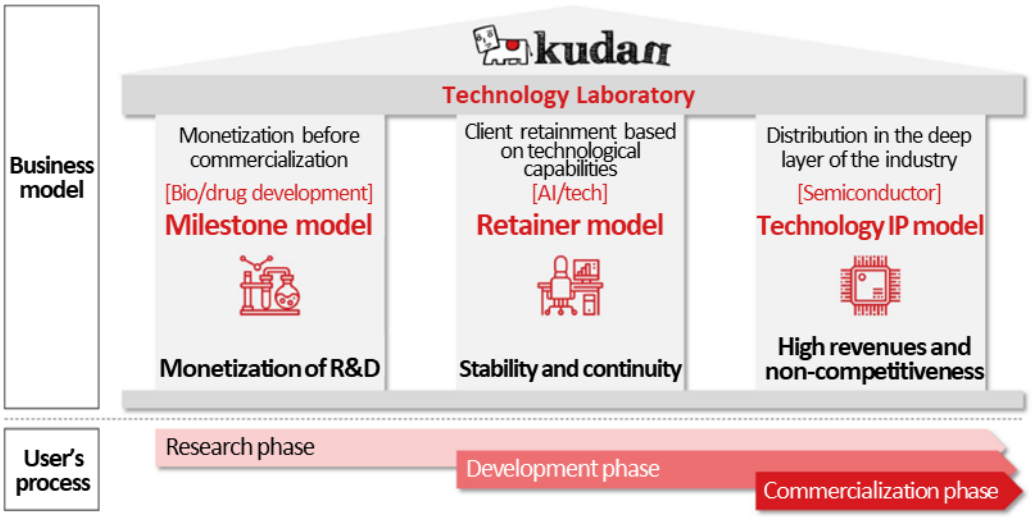
From the term ending March 2023, it is expected that the acceleration of business development with Artisense and the enhancement of support for clients' development will accelerate sales expansion and commercialization, and the investment business, etc. will improve performance.



(Taken from the reference material of the company)

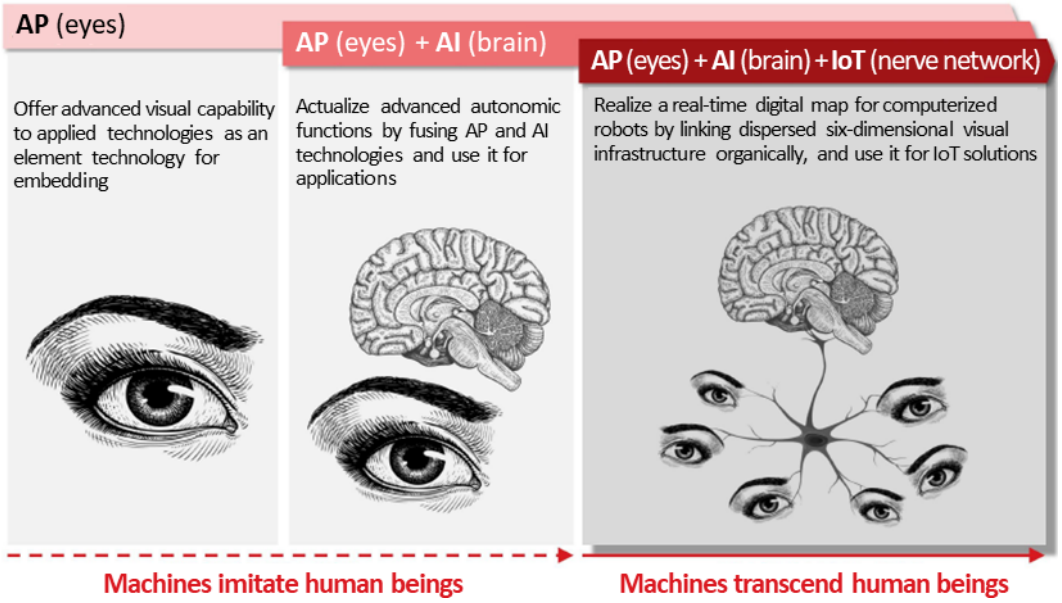
4. Growth Strategy

In the innovative technology field, the company aims to achieve the high levels of profitability, stability, and competitiveness with its unique hybrid model combining multiple effective business models according to the users' process, and lead the growth of the market.



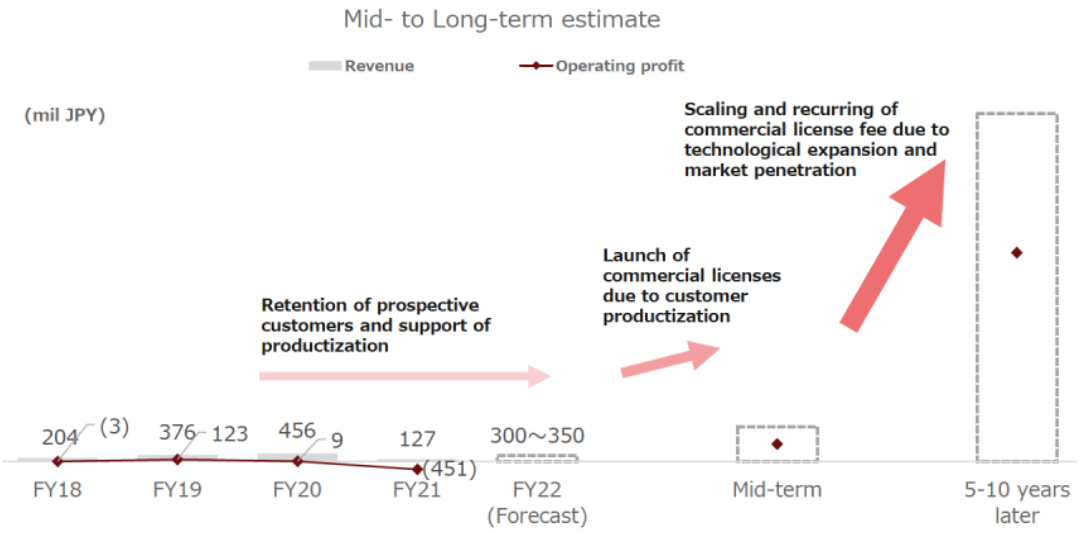
(Taken from the reference material of the company)

As mentioned in【1-3 Market Environment】, 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 in 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.



(Taken from the reference material of the company)

The company aims to increase profit steeply by increasing revenues from commercial licenses through the dissemination of technologies in the market by distributing clients' products in addition to the continued commercialization in clients' projects.



(Taken from the reference material of the company)

5. Conclusions

By making Artisense a subsidiary ahead of schedule, Kudan's already established position as a global leading-edge company, and competitive advantage will be further strengthened at an early stage. The number of projects with a high probability of being commercialized by customers has been steadily increasing, and if everything goes according to plan, the company expects to release products in the current and next terms.

<Reference: Regarding Corporate Governance>

◎ Organizational form and compositions of directors and auditors

Organizational form	Company with audit and supervisory committee
Directors	7 directors, including 4 outside ones
Auditors	-

◎ Corporate Governance Report

Last updated on June. 25, 2021

<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.