HITACHI
Social Innovation & OSS

11/21/2019

Ryo Kawai

OSS Solution Center
Hitachi, Ltd.

© Hitachi, Ltd. 2019. All rights reserved.

HITACHI
Inspire the Next

Contents

1. Outline of Hitachi

2. Our Vision and OSS

© Hitachi, Ltd. 2019. All rights reserved.

HITACHI
Inspire the Next

Contents

1. Outline of Hitachi

2. Our Vision and OSS

© Hitachi, Ltd. 2019. All rights reserved.

Hitachi Corporate Profile

HITACHI
Inspire the Next

Hitachi, Ltd.
President & CEO
Toshiaki Higashihara

Established	February 1, 1920
Capital	458.7 billion yen (as of end of Mar. 2019)
Number of Employees	295,941 (as of end of Mar. 2019)
Revenues	9,480.6 billion yen (FY2018 Consolidated)
Operating Income	754.9 billion yen (FY2018 Consolidated)

© Hitachi, Ltd. 2019. All rights reserved.

Share of Revenues (FY2018*)

HITACHI
Inspire the Next

■Others 5%

■IT 20%

■Hitachi Chemical 7%

■Hitachi Metals 10%

■Energy 4%

■Hitachi Construction Machinery 10%

■Industry 9%

■Hitachi High-Technologies 7%

■Mobility 12%

■Smart Life 16%

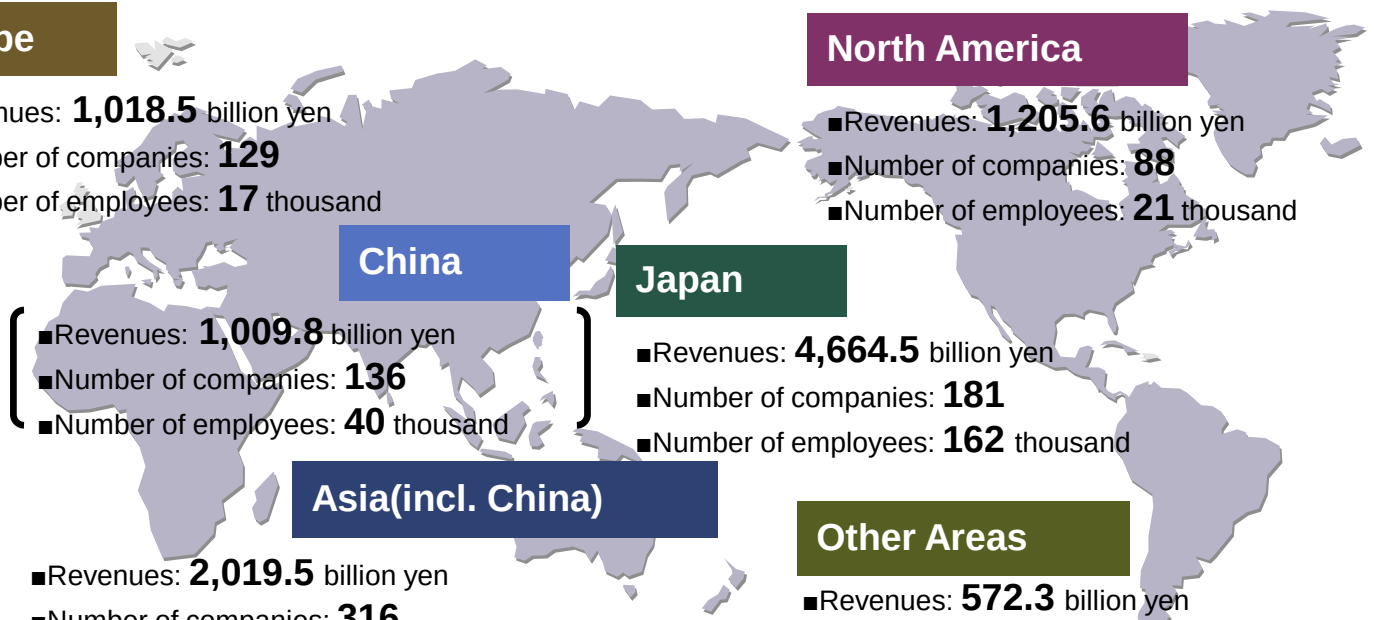
Revenues
9,480.6
billion yen

* The figures are based on the new segment classifications effective from FY2019

© Hitachi, Ltd. 2019. All rights reserved.

Global Expansion (FY2018*)

HITACHI
Inspire the Next



Europe

- Revenues: **1,018.5** billion yen
- Number of companies: **129**
- Number of employees: **17** thousand

North America

- Revenues: **1,205.6** billion yen
- Number of companies: **88**
- Number of employees: **21** thousand

China

- Revenues: **1,009.8** billion yen
- Number of companies: **136**
- Number of employees: **40** thousand

Japan

- Revenues: **4,664.5** billion yen
- Number of companies: **181**
- Number of employees: **162** thousand

Asia(incl. China)

- Revenues: **2,019.5** billion yen
- Number of companies: **316**
- Number of employees: **85** thousand

Other Areas

- Revenues: **572.3** billion yen
- Number of companies: **89**
- Number of employees: **10** thousand

Japan	Revenues: **4,664.5** billion yen/Number of companies: **181**/Number of employees: **162** thousand
Outside Japan	Revenues: **4,816.0** billion yen/Number of companies: **622**/Number of employees: **133** thousand
Total	Revenues: **9,480.6** billion yen/Number of companies: **803**/Number of employees: **295** thousand

© Hitachi, Ltd. 2019. All rights reserved.

Hitachi's solutions to increase the three values

HITACHI
Inspire the Next

To improve the Quality of Life and add values for customers

To increase the three values of social, environmental and economic by five-sector business and technology solutions

Mobility solution	Smart Life solution	Industry solution	Energy solution	IT solution
LUMADA				
Product	Product	Product	Product	Product

HITACHI
Inspire the Next

Contents

1. Outline of Hitachi

2. Our Vision and OSS

© Hitachi, Ltd. 2019. All rights reserved.

Lumada: A value creation platform that combines front-line knowledge

HITACHI
Inspire the Next

Front-line knowledge

Create new value from experience acquired through the Social Innovation Business

Lumada: A value creation platform that combines front-line knowledge

HITACHI
Inspire the Next

LUMADA

“ illuminate ” + “ data ”

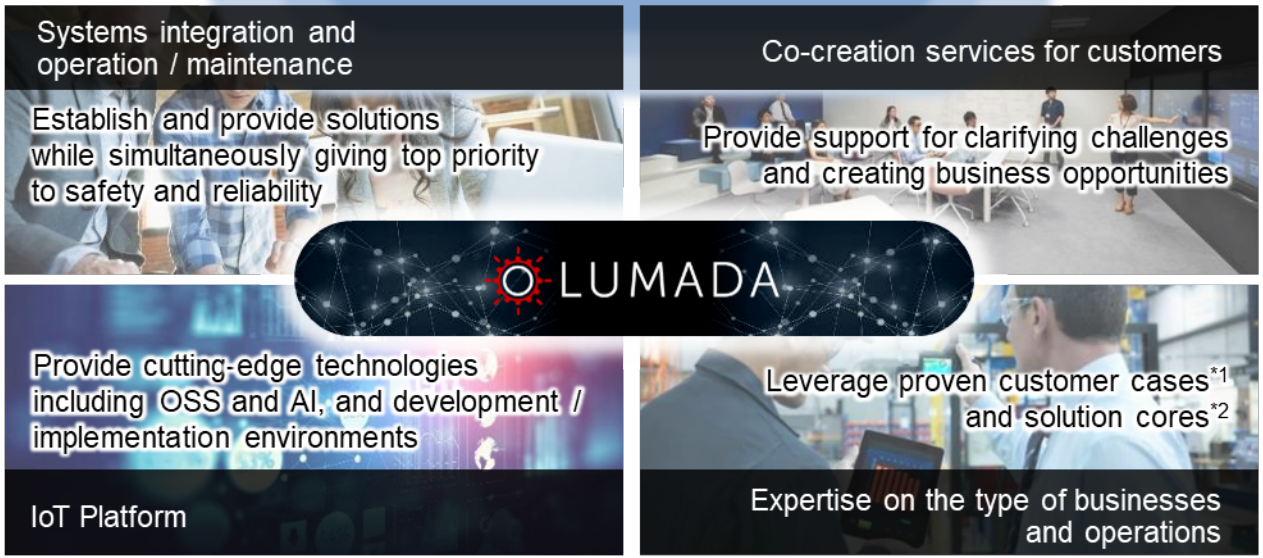
What is Lumada?

HITACHI
Inspire the Next

An engine for creating new value through co-creation with customers and partners by utilizing data

Customers' businesses

Co-creation with customers and partners



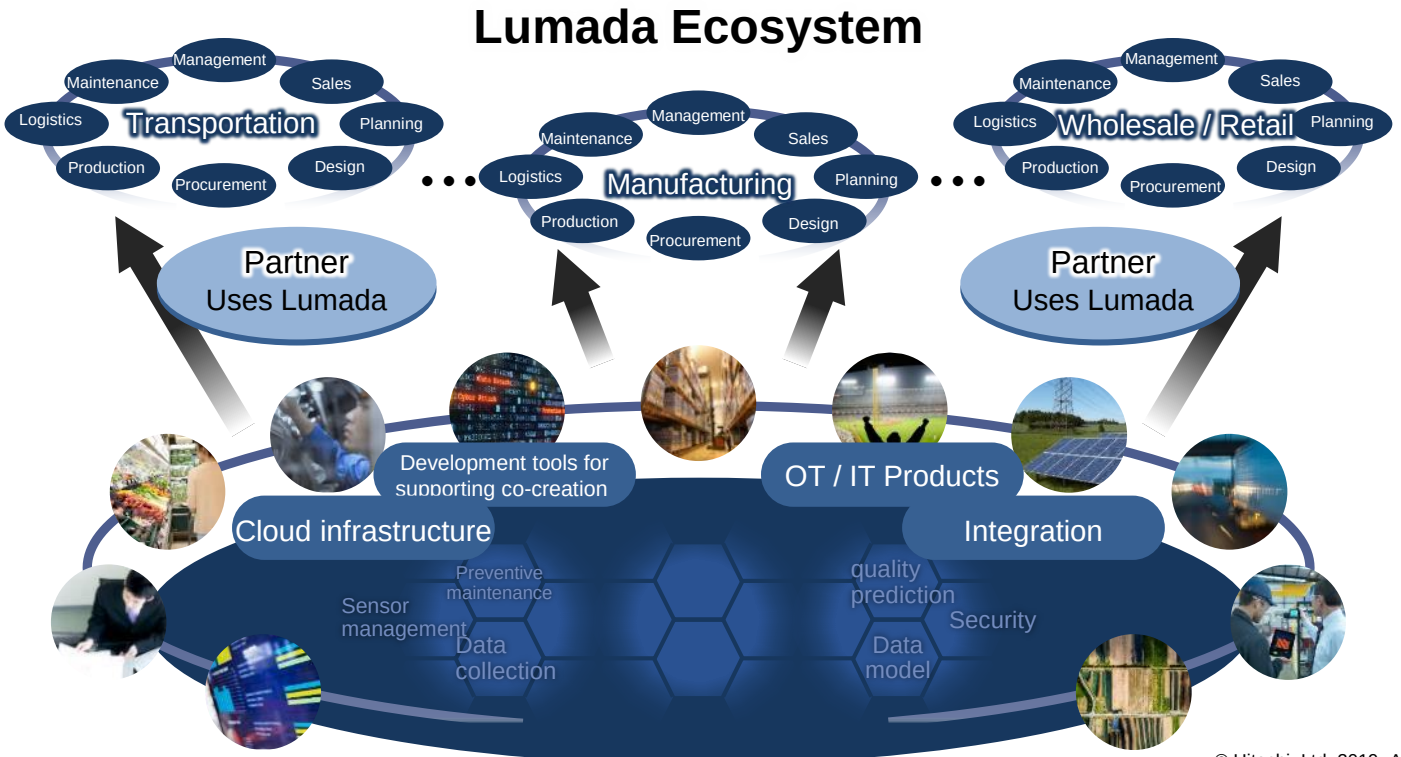
*1 Cases offering value to customers through collaborative creation and using data and analytics
*2 The essence of solutions (expertise on the type of businesses and operations, and others) that specify the customer cases

© Hitachi, Ltd. 2019. All rights reserved.

Construction of Lumada Ecosystem

HITACHI
Inspire the Next

Constructing an ecosystem with customers and partners to expand Social Innovation Business



© Hitachi, Ltd. 2019. All rights reserved.

Lumada Use Cases

HITACHI
Inspire the Next

Industry, Logistics, Power, Health Care, etc.
Hundreds of use cases accumulated
in a wide range of fields

http://www.hitachi.co.jp/products/it/lumada/usecase/index.html

Analyzing operation status of manufacturing facilities and detecting indication of product defects

Advancing promotion from customer attributes and action history

Drawing up plans of work style innovation by analyzing employees' business activities

Improving accuracy of credit examination using artificial intelligence

Improving quality of management indicators and healthcare at medical institution

Solve issues together with customers

- Copenhagen Metro
- Fukuoka City

© Hitachi, Ltd. 2019. All rights reserved.

HITACHI
Inspire the Next

Copenhagen Metro

© Hitachi, Ltd. 2019. All rights reserved.

Issues for Railway Companies

HITACHI
Inspire the Next

Issue

Eliminate congestion and increase customer satisfaction

Copenhagen Metro

24 hours driverless operation.
Connecting the center of Copenhagen city and Copenhagen airport.

Wanted to eliminate congestion on trains.

- Commuting hours
- Passengers from nearby airports and event arenas
- New metro line to be built

© Hitachi, Ltd. 2019. All rights reserved.

Solution Approach and Result

HITACHI
Inspire the Next

Solution approach

Changing the timetable depending on the number of customers

Ansaldo STS* — Driverless signal traffic control system used worldwide.

Hitachi — Demand forecast based on the analysis of customer flow and timetable optimization.

Hitachi will provide the solution to other railway companies

* Current Hitachi Rail STS

© Hitachi, Ltd. 2019. All rights reserved.

HITACHI
Inspire the Next

Fukuoka City

© Hitachi, Ltd. 2019. All rights reserved.

Issues for Fukuoka City

HITACHI
Inspire the Next

Issue

Evidence based community healthcare and nursing care

Aging society

By 2040, 1/3 of city population will be over 65.

Need more effective and efficient way to allocate limited social resources for healthcare and nursing care.

- Resource allocation optimization.
- Burden reduction on families and engaged people, and service quality improvement.
- Aggregation and provision of information about public / private services and facilities.

© Hitachi, Ltd. 2019. All rights reserved.

Solution Approach and Result

HITACHI
Inspire the Next

Solution approach

For each resident, healthcare, nursing care, and medical examinations information is aggregated.

230 types of about 2.2 billion data is aggregated in secure environment, which have been scattered inside and outside the government.

Applied knowledge, including a healthcare cost forecasting model, obtained through the analysis of big data by Hitachi Health Insurance Society.

Developing evidence-based community through the implementation of the PDCA cycle

Hitachi will expand the solution to other local governments

© Hitachi, Ltd. 2019. All rights reserved.

Technical Barriers to DX

Most common challenges:

For example…

A. Lack of blueprints to follow

B. Even PoC* is time consuming

C. Difficulties moving data

*: Proof of Concept

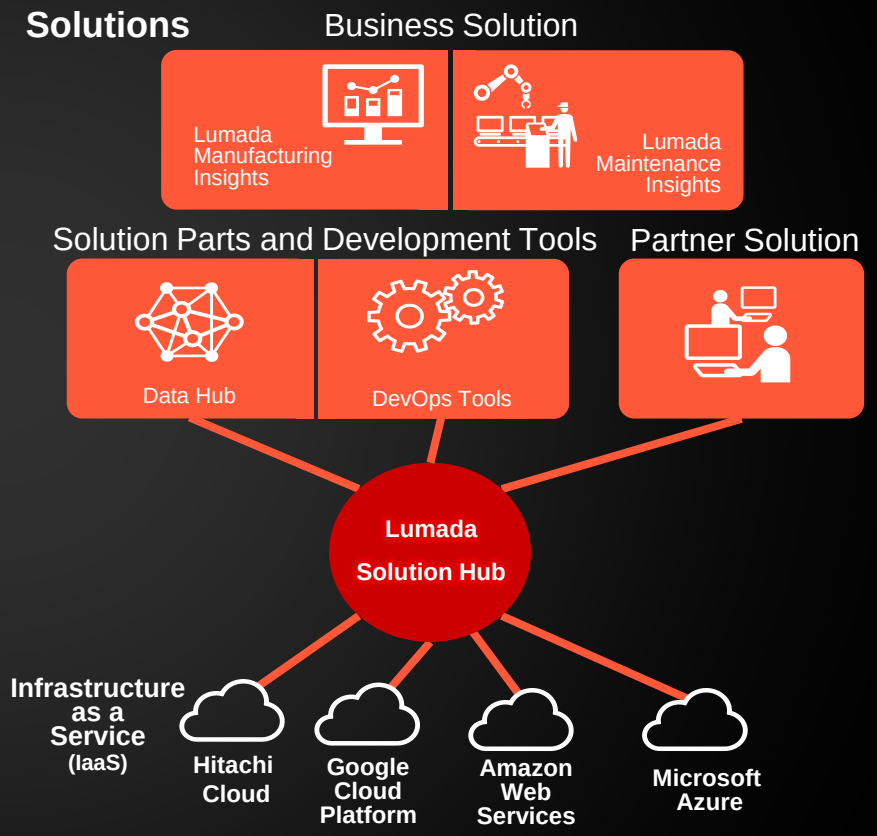
Our answer:

Lumada Solution Hub

© Hitachi, Ltd. 2019. All rights reserved.

What Is Lumada Solution Hub?

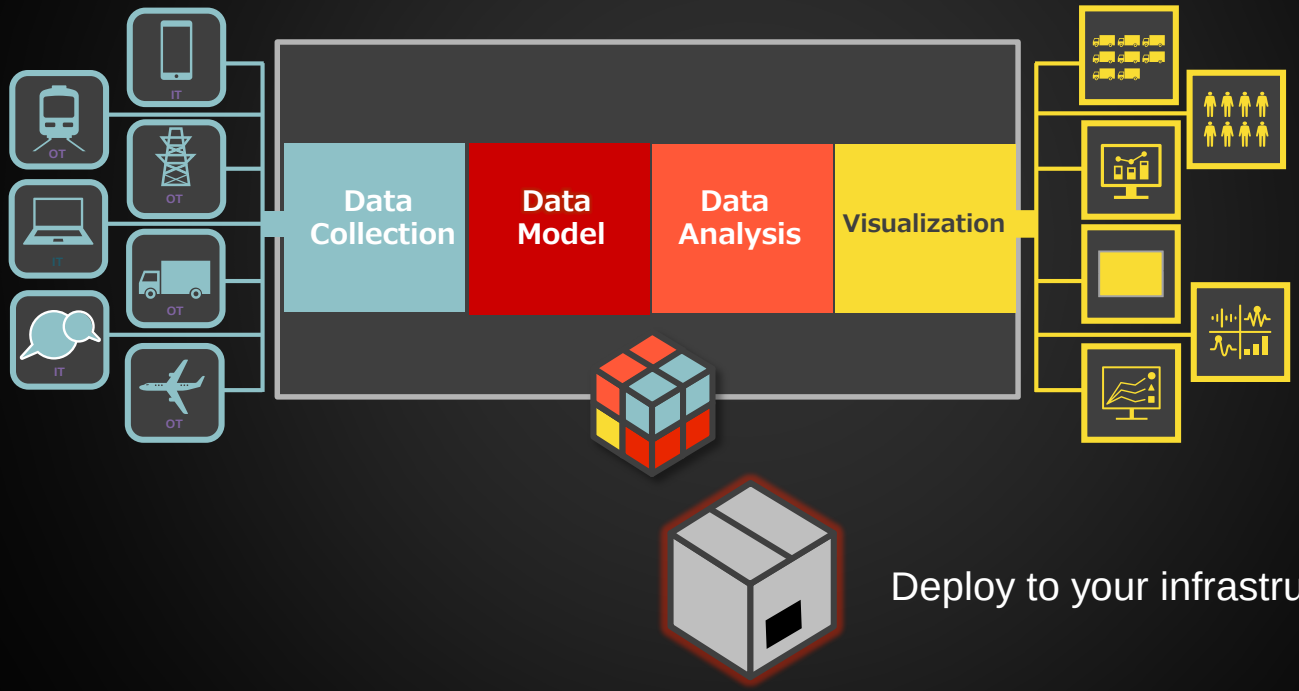
- Provides proven solutions for various infrastructures
  1. Based on success cases
  2. Out-of-the-box solutions
  3. In customers' data locations



© Hitachi, Ltd. 2019. All rights reserved.

Business Solutions

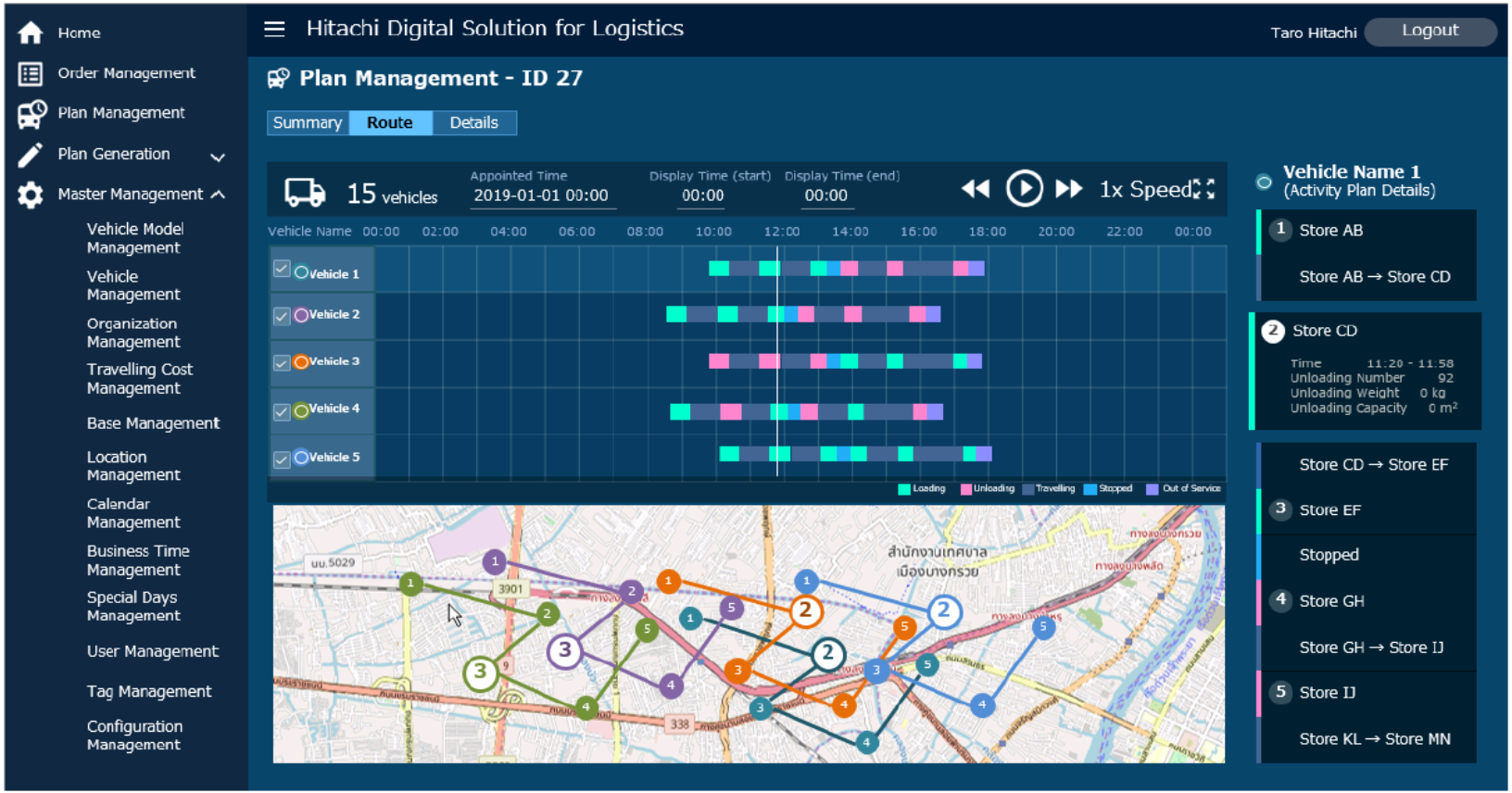
A complete set of digital applications: Ingest data and get started



© Hitachi, Ltd. 2019. All rights reserved.

Hitachi Digital Solution for Logistics

HITACHI
Inspire the Next



http://www.hitachi.com/New/cnews/month/2019/02/190228.html

© Hitachi, Ltd. 2019. All rights reserved.

Position of OSS

An engine for creating new value through co-creation with customers and partners by utilizing data

Customers' businesses

Co-creation with customers and partners

Systems integration and operation / maintenance

Establish and provide solutions
ltaneously giving top priority
nd reliability

Co-creation services for customers

Provide support for clarifying challenges and creating business opportunities

LUMADA

Provide cutting-edge technologies including OSS and AI, and development / implementation environments

IoT Platform

Leverage proven customer cases*1 and solution cores*2

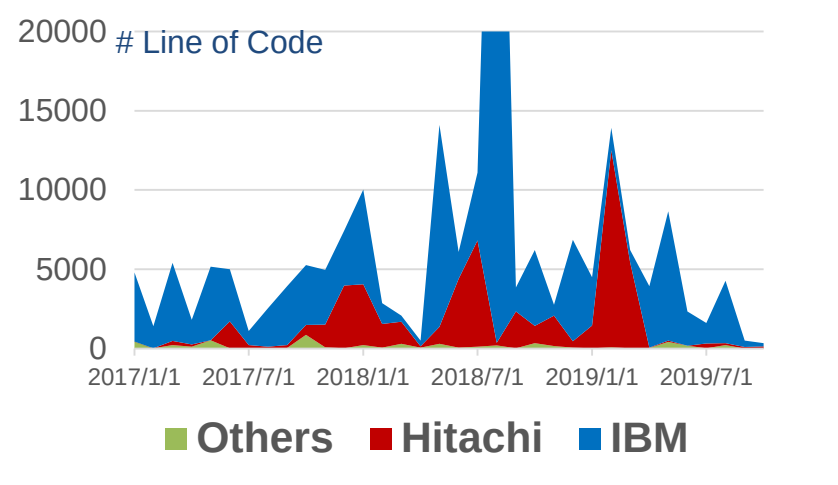
Expertise on the type of businesses and operations

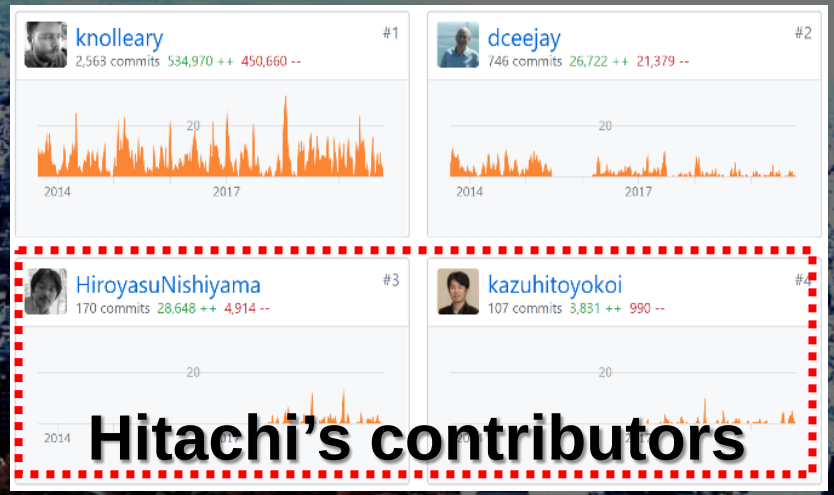
OSS is key component for our strategy

© Hitachi, Ltd. 2019. All rights reserved.

Contribute and Use a large number of OSS

- Contributing over 60,000 line of code to Node-RED community, visual programming tool for IoT applications from 2017
- 18 active contributors in Hitachi (5 person engage in dev. team on GitHub)
- Node-RED v1.0 released on September 30, 2019. We believe it will be expanded enterprise use in near the future.

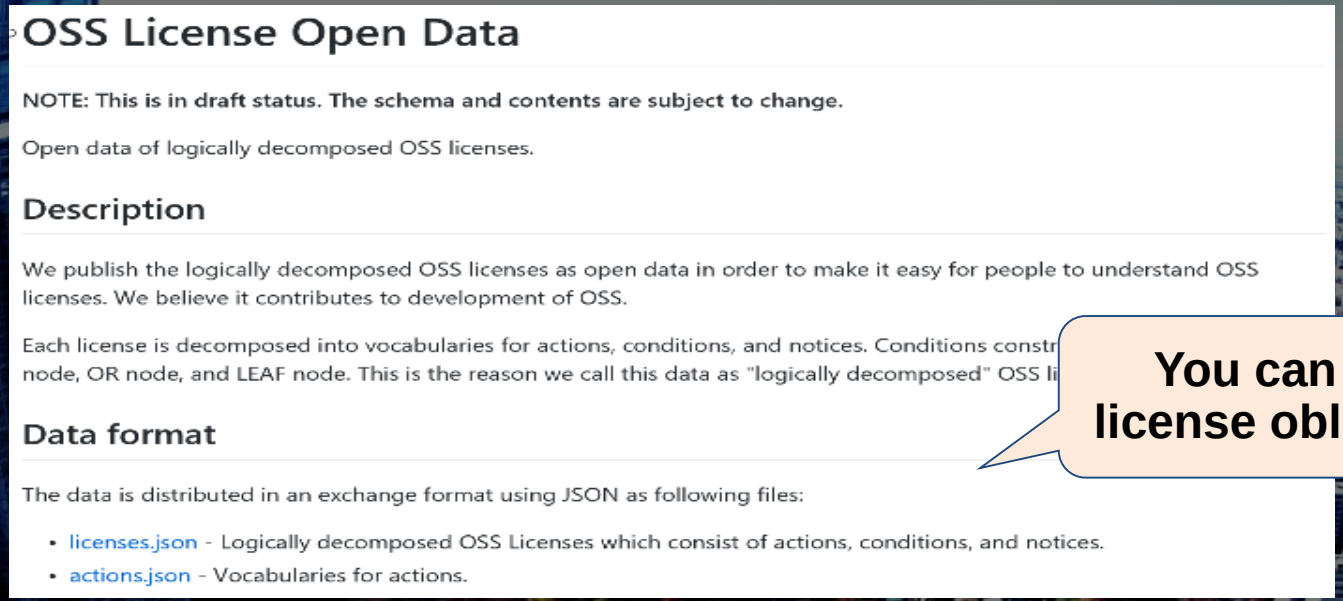




© Hitachi, Ltd. 2019. All rights reserved.

Contribute and Use a large number of OSS

- Publishing over 700 logically decomposed OSS licenses as Open Data in order to make it easy for people to understand OSS licenses.
  https://github.com/Hitachi/open-license

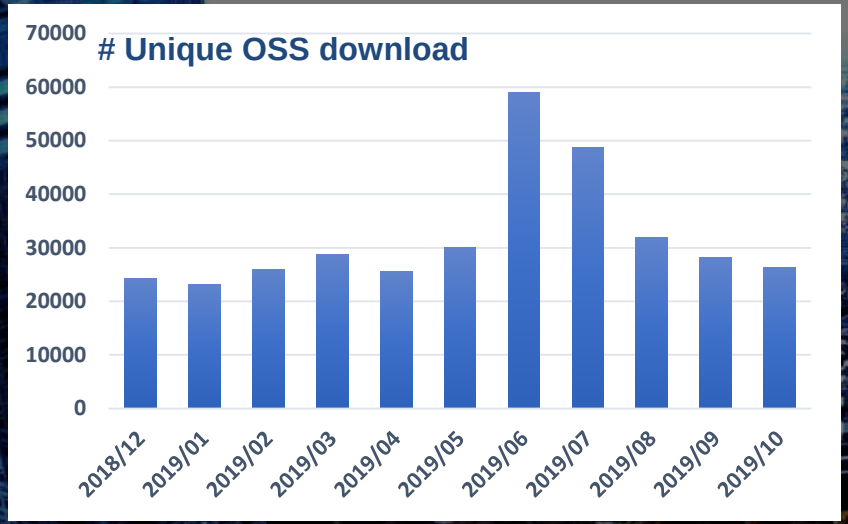


© Hitachi, Ltd. 2019. All rights reserved.

HITACHI
Inspire the Next

Contribute and Use a large number of OSS

- Using over 20,000 different type of OSS / month to develop software products, applications and IT systems
- Opening to inside OSS utilization status which shows someone/department has used OSS something



© Hitachi, Ltd. 2019. All rights reserved.

OSS: key component in the growth of Social Innovation Business

HITACHI
Inspire the Next

Hitachi, Ltd. has been a Platinum member and the board member in the Linux Foundation.

- **Contribution as Project Leads/ Development Leads**

Project	Project Purpose	Leader Contribution	Technology Contribution
Civil Infrastructure Platform	Long Time Support for Social Infrastructure	Founder / Board Member (Support Strategy)	
Hyperledger	Enterprise Blockchain	Premier Member / Board (Project Strategy)	Technical Strategy Lead
OpenChain	Supply Chain Management	Platinum Member / Board (Strategy and Japan WG)	Local Promotion and Japan PoC WG Lead
Automotive Grade Linux	OSS for Automotive		Car Navigation EG Lead
OpenPower	OSS for Power system	Gold Member	Local Promotion
RISC-V Foundation	Design Instruction Set Architecture of RISC	Silver Member	Local Promotion

© Hitachi, Ltd. 2019. All rights reserved.

OSS: key component in the growth of Social Innovation Business

HITACHI
Inspire the Next

- **Community contribution in Japan Local**

Project	Project Purpose	Contribution
PostgreSQL Enterprise Consortium	Enterprise PostgreSQL	Official Member
LPI-Japan	OSS Certification	Board
Japan OSS promotion Forum	Promote OSS in Japan	Board and WG Lead
Secure OSS SIG	Promote Security OSS in Japan	Founder/Board

© Hitachi, Ltd. 2019. All rights reserved.

HITACHI
Inspire the Next

Accelerate Social Innovations by utilizing Lumada
as the perspective of a digital-concentric business entity

Aim to become top-class solution provider in the global market

Contribute to the improvement of the quality of people's lives and customers' corporate values

Hitachi Social Innovation is

POWERING GOOD

Trademarks

HITACHI
Inspire the Next

- Linux is the registered trademark of Linux Torvalds in the U.S. and other countries.
- Node-RED is a registered trademark The JS Foundation in the United States and/or other countries.
- PostgreSQL is a registered trademark of the PostgreSQL Community Association of Canada.
- Hyperledger and Hyperledger Fabric are registered trademarks of The Linux Foundation in the United States and/or other countries.
- OpenChain is a registered trademark of The Linux Foundation in the United States and/or other countries.
- Other brand names and product names used in this material are trademarks, registered trademarks, or trade names of their respective holders.

© Hitachi, Ltd. 2019. All rights reserved.

HITACHI

Inspire the Next