GS1 Japan

The Global Language of Business

GS1 Japan Handbook

2018-2019

Message from the President

We are seeing Japan's economy recovering moderately but in a sustained manner. The turnaround of the economy has been contributing to the growth of employment opportunities. However, many industries are facing serious labor shortages, reflecting the graying of society. As part of the effort to tackle this issue, improving productivity by offering services or additional values with innovative information technologies, such as artificial intelligence (AI), the Internet of Things (IoT), robots, and Fintech, is growing.

Also in the retail sector the trend for labor-saving and automation is gaining momentum to address the shortage of manpower. The use of RFID as well as conventional barcode systems has been spreading, not only in the fields of logistics, but also in the management of merchandise and sales in stores.

For example, in the apparel industry RFID have come into use for fast self-checkout machines, instead of in the past only being used for the control of logistics and inventory. Besides that, various pilots aiming to realize automated or unattended store management are underway in and outside Japan. Moreover, it is expected that RFID will be applied to traceability systems or marketing by sharing detailed data of individual products which are captured through RFID or other tools. We will be committed to promoting such developments more than ever.

Meanwhile, the Internet is penetrating deeper into our daily life. It is said that the "moment of truth," the phase in which a customer decides to select or purchase merchandise, comes at an earlier stage. In the past, the moment of truth was identified firstly when a customer touched the product at a store, and then secondly when the customer actually used the product after purchasing it. Today however the first moment of truth comes when a customer begins searching for and gathering information about a product on the Internet, before actually experiencing it at a store.

In the wake of the shift of consumers' behavior caused by widespread use of the Internet and digitalization in our society, GS1 Japan is striving to deal with these changes as a member of GS1. In particular we will continue with the GS1 SmartSearch pilot for the second year in a row. Also, we remain committed to expanding the usage of Mulpi, the application that can read barcodes on products and reference their information in multiple languages.

We believe that these efforts to utilize GS1 standards will support consumers whenever they face the moment of truth to obtain accurate and credible information anytime they need.

We look forward to your continued support in the future.

Hirokazu Hayashi
President GS1 Japan

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1. Sector

1.1 Retail & CPG

1.1.1 Initiative for Food Manufacturers and Raw Material Suppliers: English Version of Source Marking Guideline for Raw Materials

GS1 Japan formed an Industry Working Group (WG) made up of key Japanese processed food manufacturers and raw material suppliers, with the aim to improve supply chain efficiency and visibility.
The WG has issued an English version of the Source Marking Guideline for Raw Materials as a part of this effort. This guideline defines standard data items to be shown on raw materials and the recommended data carriers in which to carry these items.

Background of guideline creation
GS1 standards have not been adopted the supply chain between most Japanese raw material suppliers and processed food manufacturers. Therefore, many raw materials do not even carry barcodes, which results in requiring visual inspection of data items and manual check.
Recently some processed food manufacturers are demanding that raw material suppliers place barcodes

Fig. 1.1.1-1 If data items and format are not standardized

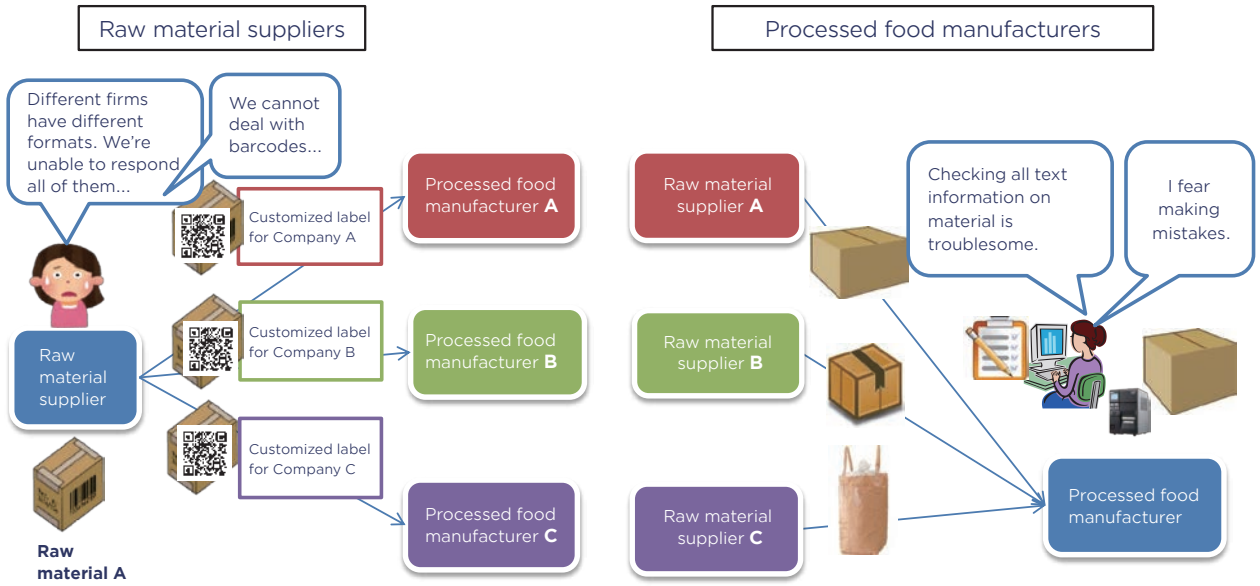
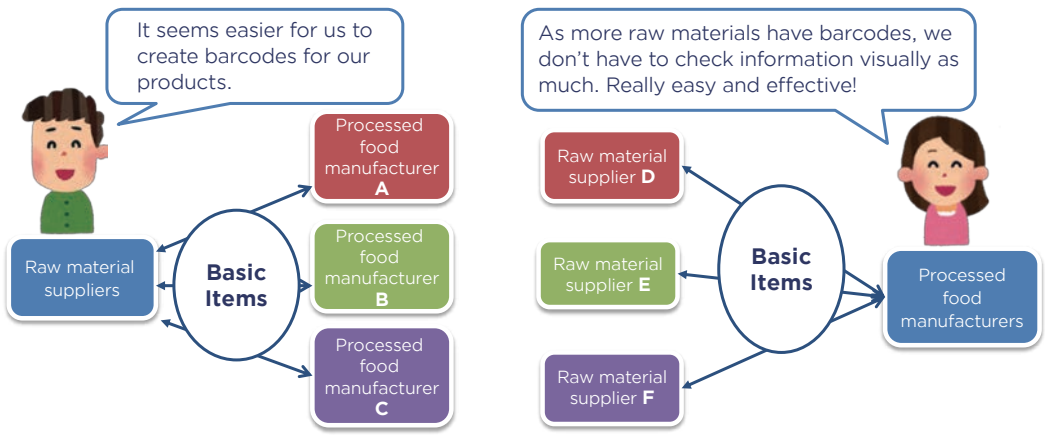


Fig. 1.1.1-2 If data items and format are standardized



*1 http://www.gs1jp.org/use-cases/data/SourceMarkingGuidelineforRawMaterials.pdf

on raw materials when delivered. However, since GS1 standards are not widely implemented, raw material manufacturers receive various requests from processed food manufacturers to mark barcodes in different data items/formats (which character set to use, the number of digits, etc.). For this reason, there have been issues, such as the need to mark different barcodes (encoding different items/formats) according to clients even for the same raw materials. If unstandardized barcodes are widely used, there is concern that raw material suppliers will face heavy burden or won't be able to deal with it. Given the above background, after analysis of the current situation and challenges, GS1 Japan created the Guideline, with participation from raw material suppliers, processed food manufacturers, solution providers, and experts.

Overview of the Guideline

This Guideline shows the rules regarding the required data items for barcodes carried on raw materials traded between raw material suppliers and processed food manufacturers along with the indication method, cautions, technical requirements, Q&As, and other matters. The main purposes of the Guideline are:

1) Encouraging raw material identification using GTIN and GS1 Application Identifier(AI)
2) Source marking: Encouraging raw material suppliers to voluntarily attach barcodes on their products.
3) Shifting from manual control to systematic management using barcodes

Fig. 1.1.1-3 Data items to be carried on a barcode

Fixed measure items	Variable measure items
GTIN: AI (01)	GTIN: AI (01)
Production Date: AI (11)	Weight/Dimensions: AI (3nnn)
Best-Before Date: AI (15) or Expiration Date: AI (17)	Production Date: AI (11)
Batch or Lot Number: AI (10)	Best-Before Date: AI (15) or Expiration Date: AI (17)
	Batch or Lot Number: AI (10)

Fig. 1.1.1-4 Recommended Data Carrier

	Recommended	Acceptable
1D symbol	GS1-128 	GS1 DataBar 
2D symbol	GS1 QR code  (01)04912345678911 (11)160510(15)170305 (10)HHI1026	GS1 DataMatrix  (01)04912345678911 (11)160510(15)170305 (10)HHI1026

Note: 2D symbol is only for domestic market, at this moment.

Fig. 1.1.1-5 Accurate operation on incoming and outgoing deliveries

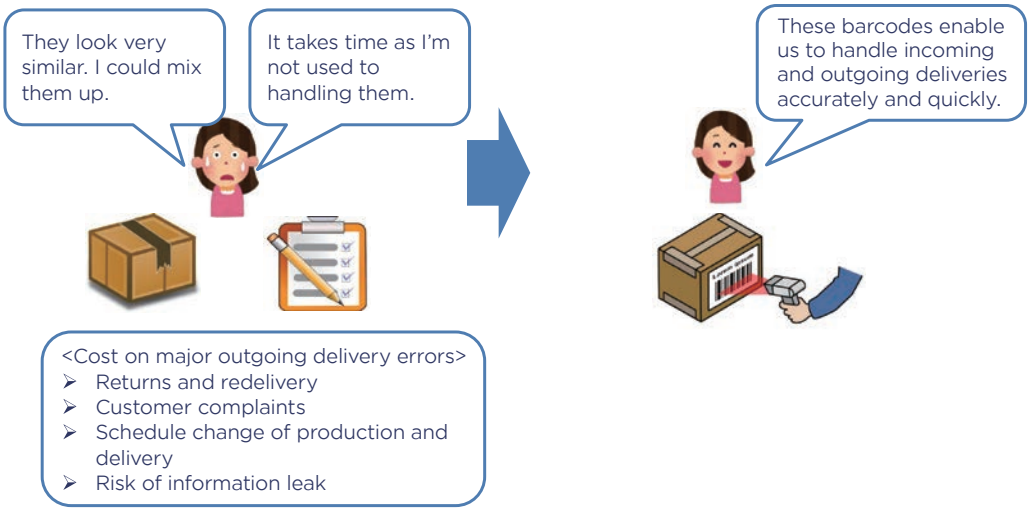
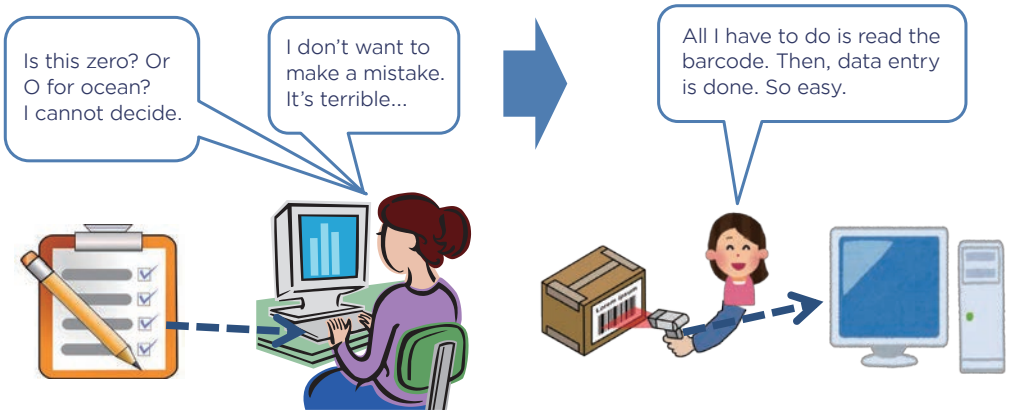


Fig. 1.1.1-6 Improving efficiency and accuracy of data entry



Expected advantages and results of the Guideline

This Guideline prescribes the standard data items to be shown on raw materials. Using these standard items and format, raw material suppliers are no longer required to translate the same information into different types of codes or to show different data items on barcodes according to each client's demand. On the other hand, it is expected that processed food manufacturers will create an environment that helps raw materials providers to easily respond to their requirements, and consequently, the raw material suppliers' source marking rate will be improved.

A barcode format system is a mechanism to read information quickly and accurately and process it on the computer. Expected results brought by standardized barcodes are as follows:

1) Accurate handling of incoming and outgoing deliveries

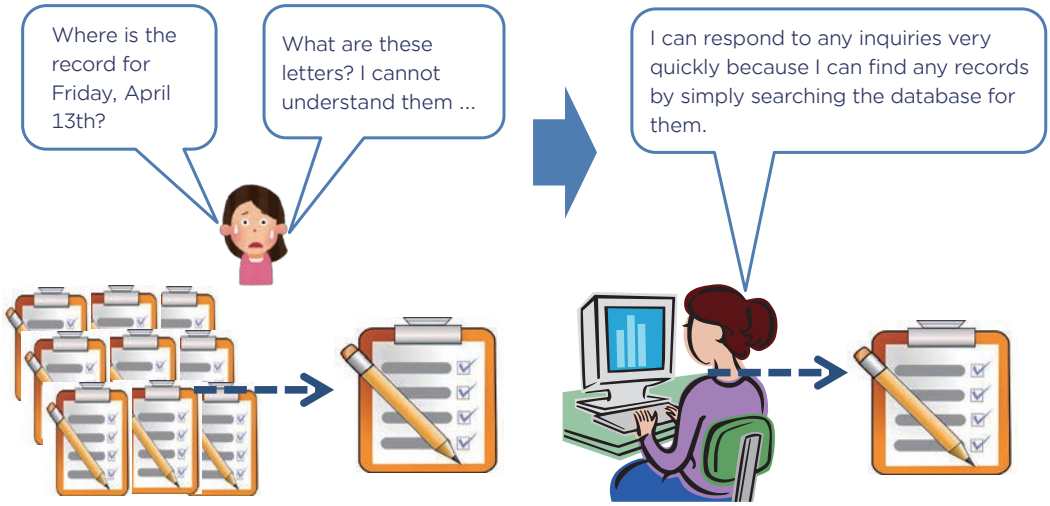
Introducing source-marked barcodes enables the shift from manual delivery operations to faster and more accurate automatic operations. Implementing systems utilizing barcodes is effective to,

- Prevent errors caused by visual confirmation and operation errors on incoming and outgoing deliveries
- Eliminate variation in time and accuracy among individual operators
- Eliminate unnecessary tasks for checking products
- Reduce time and labor costs by establishing system

2) Improving efficiency and accuracy of data entry

It is necessary to keep and archive the record of information about raw materials on a batch/lot basis as to when (date received/shipped), where from/to (origin of shipment / shipment's destination), and how many (quantity) in order to ensure traceability. While record keeping/archiving work can be done manually, use of barcodes makes it faster and more accurate to keep

Fig. 1.1.1-7 Prompt response to inquiries



and archive records.

3) Prompt response to inquiries

When responding to an inquiry from a consumer or trading partner, or in the case of an issue with a traded item, a raw material manufacturer needs to refer to the receiving/shipping records for their products. Such records might be archived as hard copy, but archiving and managing them on an electronic system would make it possible to significantly shorten data referencing time, and to respond to inquiries promptly.

Further efforts

GS1 Japan will work for wider acceptance of the Guideline and increase source marking rate in cooperation with relevant industries, and will also continue to discuss how to utilize EDI, EPICS and the product database as the focal points of the second phase effort in the WG.

1.1.2 Promoting the Introduction of GTIN for Professional-use Products: Packaging Materials for Precooked Foods and Fresh Foods

Packaging materials for food including containers for boxed lunches and take-out food, or trays for raw fish and meat are professional-use products, which consumers hardly buy at markets. In February 2015, GS1 Japan published GTIN source marking guidelines for those packaging materials of precooked foods and fresh foods. Since then, GS1 Japan has devoted to public relations activity and promotion of this guidebook to expand the use of GTIN in this business field.

TOMO JAPAN SYSTEM PLANNING (TOMO JSP), a label printing company, which designs, produces, and sells labels, has introduced the product management system using EAN/UPC symbols since April 2015, on the occasion of updating its system.

TOMO JSP introduced GS1 standards in the wake of its participation to the GTIN committee for creating the source marking guideline. Before that, the company source marked on their products only when requested by its clients. Therefore, merely 1.5% of their products displayed GTIN. However, through participation to the committee, TOMO JSP recognized the expansion of the use of source marking on food packaging materials including food trays and high expectation for use of GS1 standard barcode system from wholesalers, who are major clients of the company. In addition, the company realized the high expectation for use of GS1 standard barcode from wholesalers who are its major clients, so TOMO JSP soon started source marking As the timing of the introduction coincided with the time of its system replacing, the firm extensively introduced GS1 standards not only to respond to the clients' demand but also to use for inspection and stock control of its products.

Currently, approximately 98% of its new products have GTIN, while more than 90% of its in-stock items have barcode labels with EAN/UPC symbols. As TOMO JSP is dealing with more than 200 thousands items, some products the company has stored from before the introduction of GTIN are still unmarked. However, those unmarked items are gradually being replaced with those with barcode labels. With this product picking system, which was established aiming to be an easy-to-use and error-free system for everyone, the company is checking its products by scanning EAN/UPC symbols on loading to the storage, shipping to customers, and inventorying.

"It was more challenging than we expected to prepare GS1 barcodes for quite a few items and source-marking on them, and change the visual inspection process to the bar code reading process," Mr. Kohei Osada, Director of TOMO JSP recalled. "Although we understood the necessity of source marking system and the advantage of using barcodes, many employees in charge of logistics disagreed with us in the beginning, because the staff in the delivery center should have got used to the new procedures. However, Ms. Maiko Takahashi, a manager of the logistic department, tenaciously persuaded them by explaining the necessity of the inventory control system and the advantage of use of barcodes. As a result, on-site workers eventually accepted the use of barcode management system."
"During the early phase, skilled workers tended to express less understanding for the benefit of using barcodes. However, once they realized the system contributed to decrease in the number of the delivery errors caused by miss-picking of similar but different items, they can rest assured that the system detects the errors that human missed. Now, all on-site employees feel that they cannot do their jobs without barcodes." Ms. Takahashi said.
Thus TOMO JSP effectively decreased the number of delivery errors and improved accuracy of its inventory because inspection process of products became easier even for workers with limited experience than before the introduction of the picking system. The company also successfully achieved high product management efficiency by controlling locations of in-stock items.

Fig. 1.1.2-1
Left: Mr. Kohei Osada, Director
Right: Ms. Maiko Takahashi, Manager
(As of the date of the interviews)

Fig. 1.1.2-2 Left: An EAN/UPC symbol is attached on their product.
Right: A woman is scanning a product for shipping.

1.1.3 A Project Aiming at the Further Expansion of Utilizing RFID

GS1 Japan, along with METI, major convenience store chain operators and some manufacturers, has been engaged in a project to expand the use of RFID tags.

On April 18th, 2017, METI and five major convenience store operators in Japan (Seven-Eleven Japan Co., Ltd., FamilyMart Co., Ltd., Lawson, Inc., Ministop Co., Ltd., and JR East Retail Net Co., Ltd.) agreed to introduce RFID tags for all of the items sold in their stores (estimated to be 100 billion items per year) by 2025, under the condition that all issues identified in the research project are resolved. Based on this agreement, METI and the companies jointly formulated a statement called "Declaration of Plan to Introduce 100 Billion RFID Tags for Products in Convenience Stores (*1)."

Research Project for Expanding the Utilization of RFID in FY2016

Background

Japan has been experiencing various social transformations, an aging population, a declining fertility rate, increases in online purchases by consumers, a growing number of high-mix low-volume products responding to more diversified lifestyles, and increases in the frequency of deliveries. As a result of these changes, the transport and logistics industry in Japan has been facing serious problems such as labor shortages and greater personal costs these days.
RFID is expected to play a critical role in addressing these issues. If RFID tags are attached to every trade item, real-time item-level visibility can be provided. Moreover, sharing this visibility data in the entire supply chain can enhance location and quality management across the supply chain, and also pinpoint bottlenecks in logistical networks.

Discussion

In this research project, experts had working-level meetings to sort out the required processes and

*1 http://www.meti.go.jp/english/press/2017/0418_003.html

challenges to expand the use of RFID. The participants discussed the progress and results of a demonstration test of the autonomous cashier system with RFID, which Lawson was concurrently working on.
GS1 Japan participated in the meetings as an observer and shared information about Electronic Product Code (EPC), which is used to encode the data onto RFID tags.

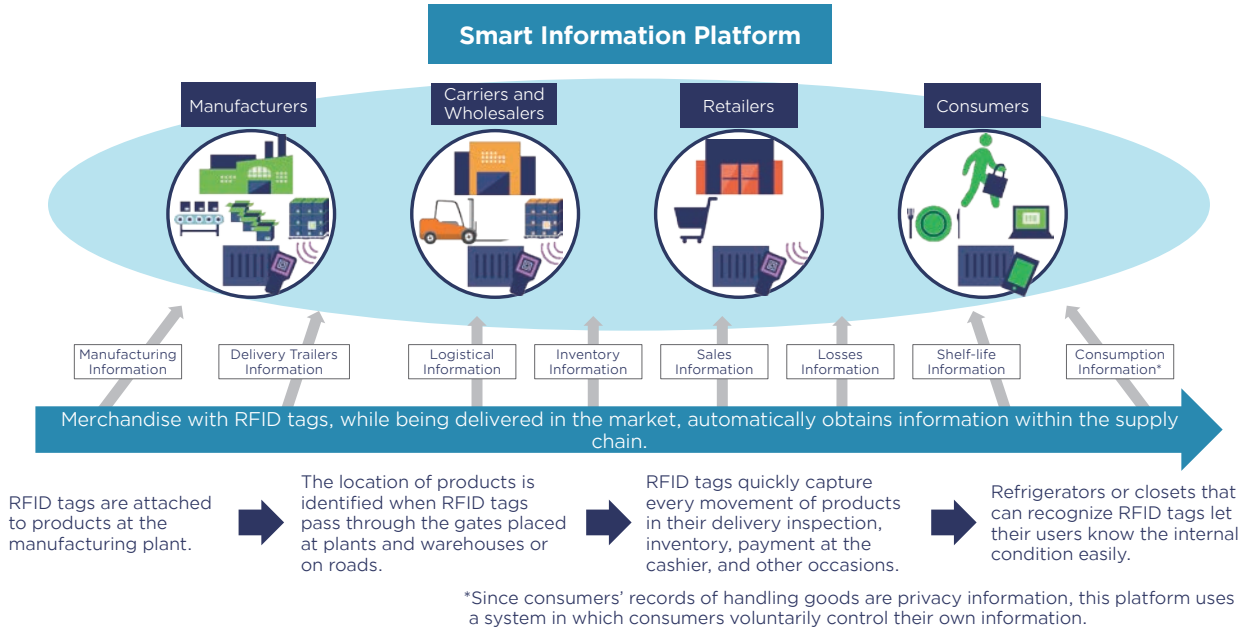
Challenges Uncovered in the Project
Based on the discussion at the meetings, the following challenges for the future were identified. A roadmap was created after main players and target dates to solve each of those challenges were established.
This roadmap includes the following items to be solved in the future:

- Reducing the price of RFID tags
  - ➢ Lowering the prices of prevailing RFID tag models to 1 yen or less per piece
    - Development of alternative novel technologies is also expected
- Expanding the introduction of the standard identification
  - ➢ Recommending the use of EPC
  - ➢ Designing additional specifications (if necessary)
- Improving the performance and function of RFID tags and their operating method
  - ➢ Developing tags for products that contain large amounts of metal or liquid
  - ➢ Developing tags for products that can be heated in a microwave oven
    - Tags that can avoid arcing (sparks) even if they are left attached to products and heated in a microwave oven

Activities in FY2017
The theme discussed in FY2017 was how to share and use the bulk data obtained by reading RFID tags in the entire supply chain.
Based on this theme, a series of demonstration tests on data linkage were performed at three convenience stores in Tokyo in February 2018. In the tests, RFID tags attached at the manufacturers were read on incoming/outgoing deliveries and sales at manufacturers, wholesalers, and retailers. These read data were shared with each companies in the supply chain via the platform for data linkage, which was established for the test.
On this platform for data sharing, EPC Information Services (EPICS), a standard of GS1, was adopted. When stakeholders within the supply chain can share the data in a common and understandable form by using this EPCIS standard, not only individual companies, but all participants within the entire supply chain can enjoy its benefits including realization of traceability and data utilization for marketing.

GS1 Japan will keep contributing to this project to support establishing the standard across industries related to RFID tag utilization and data sharing.

Fig. 1.1.3-1 Future Image of RFIDUtilization in Supply Chain



*Since consumers' records of handling goods are privacy information, this platform uses a system in which consumers voluntarily control their own information.

Reference: METI "Declaration of Introducing 100 Billion Electronic Tags for Products in Convenience Stores" Appendix

1.1.4 UJIE SUPER CO., LTD realizes Improved Paperless and Efficient Operation with Ryutsu BMS

In March, 2017, UJIE SUPER CO., LTD (hereinafter UJIE) renewed its core and EDI systems along with the introduction of Ryutsu BMS, a standard EDI in Japan, to improve operation efficiency of order placement and logistics as the infrastructure to support supply of goods.

About UJIE SUPER CO., LTD

UJIE is a food supermarket chain founded in 1947 and headquartered in Miyagi Prefecture. It operates 31 stores mainly in central and northern Miyagi Prefecture with annual sales of 31.6 billion yen (*1). Some outlets were severely damaged in the Great East Japan Earthquake in 2011, which resulted in a renewed appreciation for the societal role supermarkets play in supporting the regional lifelines. UJIE decided to introduce more efficient and stable systems.

Shift to Shared service

Previously, the core systems were operated via an on-premises server. Primarily aimed at dealing with aging servers and responding to the reduced tax rate (*2), UJIE switched to using cloud systems provided by CGC Group, a voluntary chain of which UJIE is a member. At the same time, the EDI system, which had been operated on JCA Protocol (*3), was replaced to Ryutsu BMS.

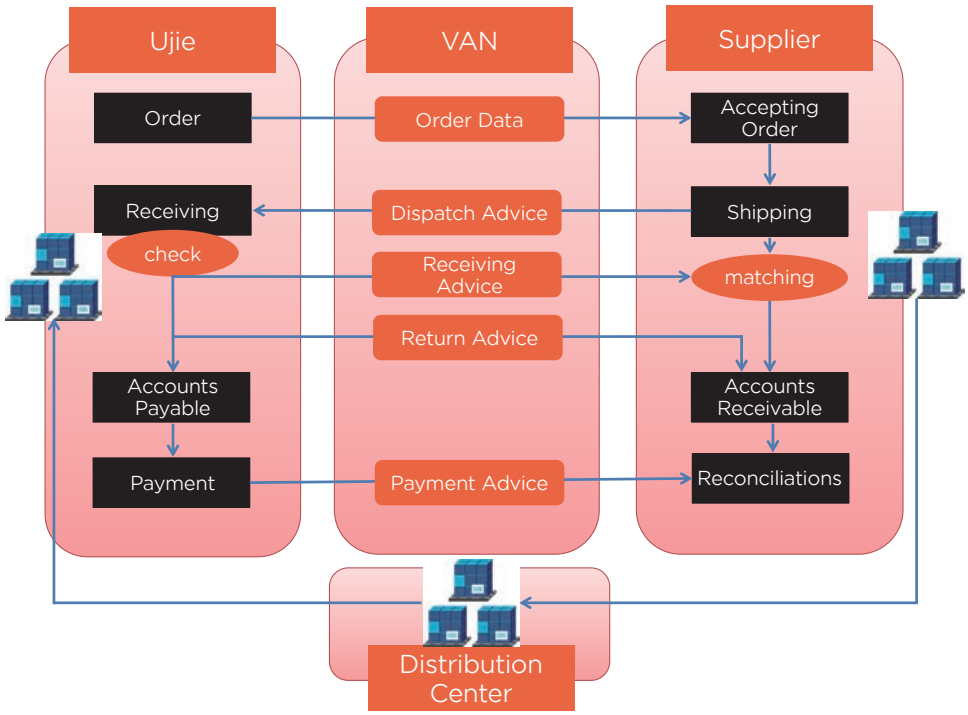
In order to change the EDI system, UJIE held a briefing session for all its suppliers in October, 2016. At the session, “improved paperless and efficient operation” was identified as the main objective for introducing the new EDI. Cooperation from suppliers was also requested and a GS1 Japan representative explained the significance of introducing the EDI standard and its current level of popularity.

12,000 Purchase Slips a Month

Before Ryutsu BMS was introduced, the data of order placement was sent to suppliers through regional VAN. Some of suppliers used Web-EDI to send ASN, indicating a certain degree of paperless operation had been achieved. However, some smaller suppliers couldn’t afford to use EOS (Electronic Ordering System) and in such cases, there was no choice but to use paper slips.

Furthermore, many local suppliers deliver goods

Fig. 1.1.4-1 New EDI Flow



*1 As of February, 2017.
*2 In Japan, plans are set to reduce the consumption tax on foodstuffs and the like as of October, 2019.
*3 This is the standard communications protocol for electronic ordering, established in 1980 by the Japan Chain Stores Association (JCA). The communication circuits available for the protocol are public circuits (2,400 bps) and DDX circuits (9,600 bps), and it cannot transmit Kanji and images. DDX circuits are packet-type communication services that use telephone circuits.

directly to the outlets, rather than UJIE's distribution centers. While the purchases were finalized at outlets, all result data was processed at headquarters. As the outlets increased in number and size, the number of necessary delivery slips to be processed also increased, reaching an average of 12,000 per month. This made paper slips a huge bottleneck in enhancing operational efficiency.

Choice between Two Systems

As a result suppliers can now choose between the two systems; Ryutsu BMS or Web-EDI. The new EDI flow is shown in Fig 1.4.1-1. By way of CGC Group's VAN system, the data of order placement, dispatch advice, receiving advice, returned goods, and payment is exchanged. The dispatch advice is uploaded on the server on or before the delivery date, so that the purchase data can be added the next day.
As mentioned above, suppliers can choose between the two EDI systems, Ryutsu BMS (either Server-to-Server Protocols: ebMS or Client-to-Server Protocol: JX Protocol) or Web-EDI, which has the same data items as Ryutsu BMS. With the less expensive Web-EDI, smaller suppliers are now able to start EDI transactions with a small initial investment, leading to improved paperless and efficient operation. The utilization ratio of the two communication systems is almost even.
In terms of both data utilization and delivery slips issued upon delivery of goods to the distribution centers, efforts, such as layout change, are being made to reduce paper consumption.

More Efficient and Sophisticated Operation through EDI

Introduction of EDI is also making the process of billing and payment more and more efficient. Firstly, as receiving advice is sent, suppliers can check the data of UJIE's accounts payable on a daily basis, allowing incorrect calculations to be corrected as they are found. In addition, with regard to the payment data, the CSV data, which had been sent to suppliers at the end of each month, is now sent as XML data using Ryutsu BMS, simplifying operation (*4).
There is also a high expectation that sophisticated unit article management will enable previously impossible operations. According to Mr.Funajima, Director of the Information System Office of UJIE, orders were previously placed while referencing previous sales and order records on a handheld terminal to forecast demand. In this way, although the number of placed orders could be confirmed, it was impossible to see how much stock was in inventory without stock-checking. This meant there was room for improvement in terms of order placement accuracy.
The introduction of Ryutsu BMS made it possible to keep track of the quantity of received items. Combining receiving data with the POS sales data enabled accurate inventory management and order placement Since July, 2017, pilot operation of automated order placement has been continuing in two outlets, one large and one small.
Introduction of EDI, which enables accurate and swift data transmission, is expected to promote further operational efficiency in future.

Fig. 1.1.4-2 Mr. Naohiko Funajima, Director of Information System Office of UJIE SUPER CO., LTD

Fig. 1.1.4-3 UJIE SUPER CO., LTD Branch Store in Odawara, Miyagino Ward, Sendai City

*4 In Japan, it's a general practice to combine and pay the total value of monthly transactions and service charges, and the like. Therefore, it's difficult to identify which transaction has been paid for, in some cases. To deal with this issue, retailers transmit and provide the data of payment breakdown, as a popular countermeasure.

1.2 Healthcare

1.2.1 Introduction of Hands-Free Picking Utilizing GS1 Standards at Kyoto Second Red Cross Hospital

There are many different kinds of medical supplies used for surgery, and the necessary instruments differ according to the surgery to be performed. It is imperative that the proper instruments are prepared prior to each operation. However, this preparation is a complicated and highly responsible task. Even a single error can be a threat to patient safety. Thus, Kyoto Second Red Cross Hospital implemented a hands-free picking system utilizing wearable devices for scanning GS1 barcodes affixed to medical supplies to improve patient safety and medical efficiency.

Implementation of Hands-Free Picking System

The Kyoto Second Red Cross Hospital has been using GS1 barcodes for picking for over 10 years. Originally, medical workers cross-checked data in a medical supply barcode against the master data using an ordinary handheld scanner. After confirming, the selected instrument was placed onto a hand cart. Whilst this is a more accurate method when compared with manual checking, it still required medical workers to do the work one-handed, while pushing the hand cart and holding the scanner.

In May 2013, the hospital implemented a hands-free picking system that utilized wearable devices with the aim of achieving even greater efficiency. This system uses three devices: a smart glass for displaying operation instructions, a headset for issuing voice commands, and a small wrist wearable barcode scanner.

The operation process is as follows:

- The worker wears the three devices and starts picking, while holding a handbasket.
- Followed by the call “start.”, the worker scans a barcode on the list of medical supplies.
- The medical supply to be picked is displayed with its storage location on the smart glass.
- The worker heads to the storage location (shelf) according to the display and reads the barcode attached to the medical supply (or shelf, case) with the barcode scanner worn on the wrist.
- After reading the barcode, the worker places the medical supply in the handbasket. When the barcode of the medical supply is read, the smart glass automatically shows the next item to be picked.

This process is repeated until the worker finishes picking all the necessary medical supplies.

Fig. 1.2.1-1 A medical worker preparing medical supplies

Reviewing Flow Lines

Almost 7,000 operations are conducted annually at Kyoto Second Red Cross Hospital. The number of surgical techniques is close to 300, so it is an intricate task to arrange the medical supplies properly according to each operation method every time.

Unlike distribution centers or warehouses, work flow lines in hospitals are rarely taken into consideration because there are various medical supplies in different shapes and the storerooms are tiny.

With the introduction of the hands-free picking system, Kyoto Second Red Cross Hospital decided to review work flow lines as well. The storage place of medical supplies was reviewed according to the frequency of use, and an application that can set the optimum flow line for each picked item was incorporated into the system.

Additionally, as many of the instruments are similarly named and their shapes are indistinctive, indications of red circle were added to the pictures of medical supplies to be displayed on the smart glass to allow for more reliable supply picking. The red circles are displayed on unique areas that make the item distinguishable from others.

With the introduction of hands-free picking system and the review of flow lines, the burden of this work has greatly reduced and accurate surgical supply picking has become possible without requiring a deep knowledge of medical products.

Aiming for Further Medical Safety and Efficiency

In addition to hands-free picking, the hospital uses GS1 barcodes to record the usage history of reimbursable medical materials and to verify medicines.

Medical Doctor Tanaka, Deputy Hospital President, has been promoting the introduction of the system utilizing

Fig. 1.2.1-2 Medical Doctor Tanaka, Deputy Hospital President of Kyoto Second Red Cross Hospital

Fig. 1.2.1-3 the Kyoto Second Red Cross Hospital

GS1 standards, although he has also noted some limitations.

First, there is a problem that some products have multiple barcodes on one package. Medical workers may find it difficult to identify which barcode should be scanned.
While the hospital has prepared a manual and distributed it to each ward to help medical workers identify which barcode to read, Dr. Tanaka claims that applying two or more barcodes on the same package inconveniences users.

Dr. Tanaka also notes the fact that maintaining the master data, which is indispensable for such systems, is a demanding task. He hopes for the development of a standard database keyed by GTIN that can be used at any hospital to reduce the enormous amount of labor required to continuously update the master database.

Utilizing GTIN on medical supplies improves not only patient safety, which is the hospital's first priority, but also work efficiency. It is expected that moving forward the current status of barcoding ratio for medical supplies will continue to improve, and GS1 barcodes will further contribute to medical safety and efficiency.

Outline of Kyoto Second Red Cross Hospital
The Kyoto Red Cross Hospital, founded in 1926, is a regional acute hospital with 672 beds (*1).
The hospital serves approximately 337,000 outpatients and 189,000 inpatients annually.

1.2.2 Publication of the Direct Marking Operations Guide for Medical Devices

GS1 Healthcare Japan published "Surgical Instrument Marking Operations Guide" in 2011. Since then, Unique Device Identification (UDI) regulations have been implemented globally, while direct marking technology has improved. Based on these situations, GS1 Healthcare Japan newly published "Direct Marking Operations Guide for Medical Devices" in 2017.

1. What is direct marking?

Direct marking is the process of marking a symbol directly onto an item using intrusive or non-intrusive method instead of applying a label or using another indirect marking process.
Direct marking is used for products such as those below;

Fig. 1.2.2-1 Direct Marking Operations Guide for Medical Devices

*1 As of April 2017.

(1) Products that are extremely small and have significant space constraints to place a barcode label on them,
(2) Products that are intended reprocessed and reused.
Most medical devices are reused repeatedly after cleaning and/or sterilization. If a barcode label is pasted on those products, there is a risk of peeling-off from a product during a surgery and being left inside a patient's body. For the reasons above, direct marking is being adopted worldwide for medical devices, especially for surgical instruments.

2. What is required to introduce direct marking?

Proper assignment of GS1 identification keys, appropriate marking methods, and a full understanding of reading equipment are necessary for direct marking. Therefore, the new guide mentions the latest information on the above points. In addition, the guide includes use cases of several medical institutes that are improving their medical safety and efficiency using direct marking on surgical instruments.

3. Use cases of Direct Marking at Medical Institutions

The guide shows two cases of medical institutes that implemented GS1 Standards and direct marking: NTT Medical Center Tokyo and the University of Fukui Hospital.

1) NTT Medical Center Tokyo

In 2011, NTT Medical Center Tokyo obtained GS1 Company Prefix to mark Global Individual Asset Identifiers (GIAI) on its endoscope components using GS1 DataMatrix.

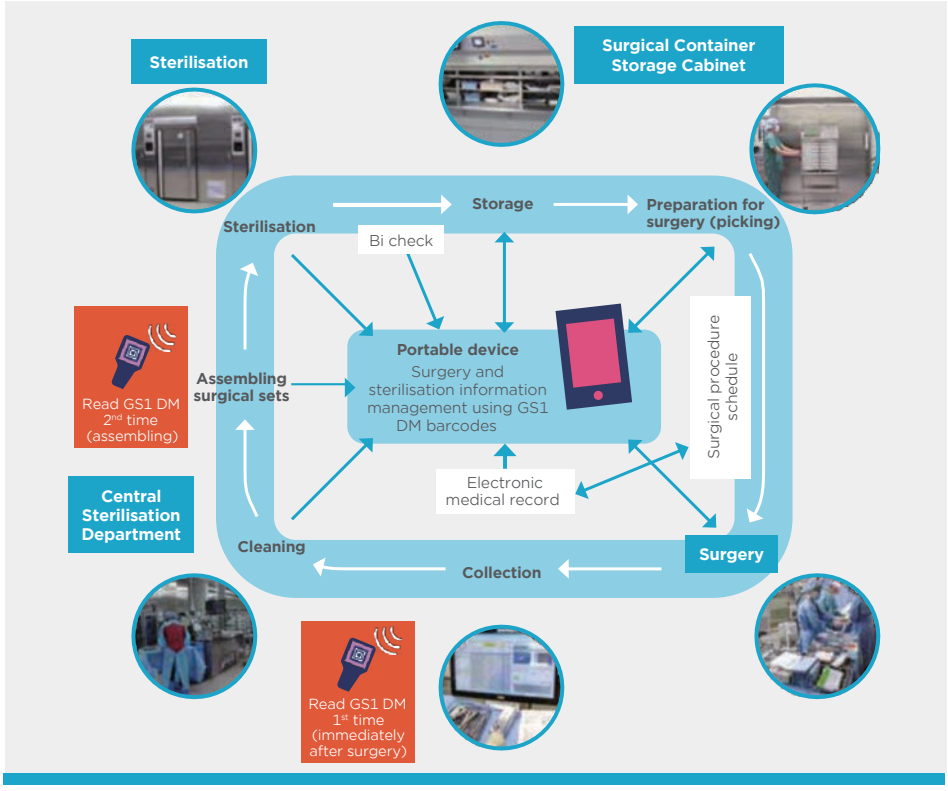
At the hospital, GIAIs on endoscope components are read at the assembling process before sterilization and the collection process after surgery. These processes enable the hospital to assemble the components properly and record the use history of all endoscope components for each operation.

Thanks to the use history, the hospital could reduce the number of instruments prepared for surgery and avoid unnecessary sterilization which could hasten the deterioration of instruments. In addition, the information improved inventory management by appropriate component exchange and purchase schedules.

2) University of Fukui Hospital

University of Fukui Hospital implemented an integrated sterilization management system when the hospital moved its wards, the surgery division, and the

Fig. 1.2.2-2 Workflow of the Integrated Sterilization Management System



sterilization control division into new buildings in 2014.

The hospital uses GIAI for accurate identification of surgical instruments and Global Location Numbers (GLN) for location control.
University of Fukui Hospital installed a special storage cabinet to store surgical instruments. The cabinet automatically rotates and stops at the position where the necessary instrument is stored.
The cabinet has 600 shelves and GLNs are allocated to them to identity their location. The usage of GIAI and GLN enables the hospital to securely manage instrument and significantly reduce working hours.

4. Conclusion

With more and more countries/regions adopting UDI regulations, direct marking is expected to be used globally in the future. GS1 Healthcare Japan makes efforts to deliver appropriate methods of direct marking in accordance with GS1 standards. In addition, GS1 Healthcare Japan will promote the use of direct marking at healthcare facilities to improve patient safety and efficiency of healthcare services.

1.3 B2C

1.3.1 GS1 SmartSearch Pilot Project

In 2017, GS1 Japan has conducted the GS1 SmartSearch (*1) pilot project, collaborating with major manufacturers, retailers and other companies.
As the results, introduction of GS1 SmartSearch in a correct way was confirmed to make Search Engine Optimization (SEO) effective. On the other hand, it was also showed that the result could be negative depending on the way of introduction.
Based on the above results, GS1 Japan is committed to expansion of the use of GS1 SmartSearch through its activities, aiming to support companies to spread their product information effectively and to increase consumers' accessibility to it.

GS1 Japan SmartSearch Committee

In 2017, GS1 Japan launched the GS1 Japan SmartSearch Committee, which consists of 15 domestic companies including retailers, wholesalers, manufacturers, data base providers, and SEO firms (1.3.1-1). In the Committee, they translated GS1 Web Vocabulary in Japanese, defines the format of structured data to embed product information on the web. Then, the committee was prepared and two types of pilot. Also, aiming to expansion of domestic use of GS1 SmartSearch, the committee members considered introducing additional items and codes, and discussed other usage of GS1 SmartSearch than for SEO like referencing from smartphone Apps.

Two Types of Pilot Experiments

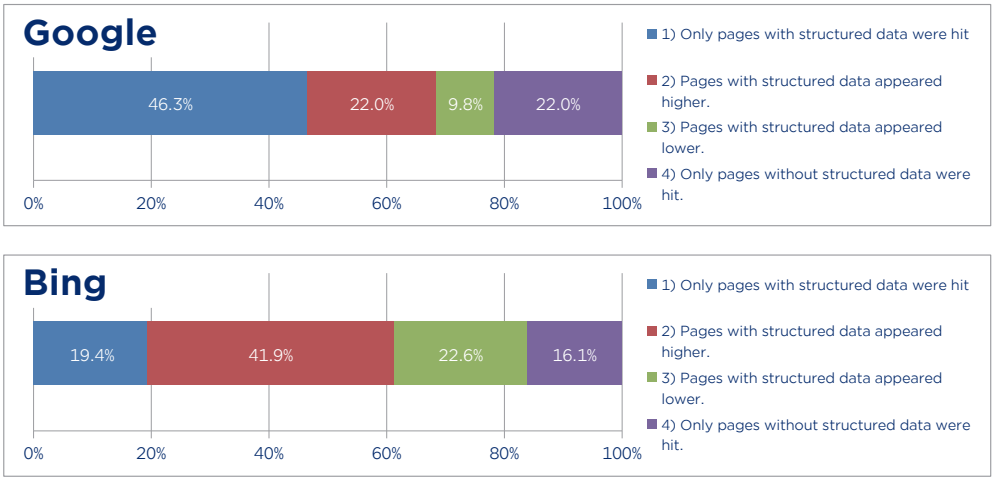
The GS1 Japan SmartSearch Committee conducted two types of pilot experiments in FY2017.
In the first experiment, GS1 Japan created a pilot website based on the product information provided by companies to investigate the search ranking results and the page views of those products among other test items. The second experiment was conducted on several e-commerce (EC) or corporate websites, which are actually operated by the companies. GS1 Japan loaded the structured data on those websites to observe the difference between before and after data loading.

Fig. 1.3.1-1 Participants of GS1 Japan SmartSearch Preparatory Committee

GS1 Japan SmartSearch Preparatory Committee Members	**Observers**
AEON Co., Ltd.(GMS) Kao Group Customer Marketing Co., Ltd. (Wholesaler) KOKUBU GROUP CORP. (Wholesaler) Cocokara fine Healthcare Inc. (Drugstore Chain) KOMERI Co., Ltd. (DYI store operator) Takashimaya Company, Limited (Department Store) TAKEDA LEG WEAR CO., LTD. (Apparel Maker) Nike Japan Corp. (Apparel Maker) Matsumotokiyoshi Holdings Co., Ltd. (Drug store) Lion Corporation (Commodity Manufacturer) LOTTE Co., Ltd. (Food Manufacturer) Wacoal Corp. (Apparel Maker)	GeekFeed Co., Ltd. (SEO firm) Japan Inforex INC. (Database provider) PLANET,INC. (Database provider) U-FACTORY KK (Website creation company)

*1 https://www.gs1.org/gs1-smartsearch

Fig. 1.3.1-2 Effect of Presence/Absence of Structural Data on Search Rankings (Pilot Website)



Websites for Pilot Experiments

Overview

GS1 Japan was provided with product information from three retailers and three manufacturers, and then created a pilot website, and published 28 product pages that loaded with structured data on it. Simultaneously, 22 pages without structured data that showed similar products were published for comparison. (*2)

In this experiment, the effect brought by the presence or absence of the structured data was evaluated using various indexes on whether the search rankings, page views (PVs), explanation of snippet (*3) displayed under the searched words were differentiated.

Results

As the searching results of about 80 words, the effect of the structured data aligning with GS1 SmartSearch on search rankings was clearly identified (Fig1.3.2-2). In over 60 % cases, the pages with the structured data received a higher valuation from search engines than those without structured data. Consequently, the result statistically proved that introduction of GS1 SmartSearch is significantly effective for SEO.

On the other hand, as for the effect on page views, the amount of data obtained during the test period was too small to evaluate them. Also, as for the effect on snippets, there was no significant difference between the presence and absence of structured data.

Pilot Experiment on the Company Websites

Overview

In this test on company websites, the structured data was loaded on the websites of two retailers and two manufacturers. The search rankings, number of page views, conversion rates (CVR) and other test items were investigated for 16 product pages for four weeks including the periods before and after introduction of the structured data.

Results

As the results of the pilot experiment, there was no positive effect neither on search ranking nor PVs (Fig1.3.1-3 Fig1.3.1-4). The search rankings of target products did not rise, and also their PVs, number of unique users (UU), or CVR did not increase.

Consideration on the Results of Pilot Experiments

In the pilot websites, search rankings of the products were raised, which proved that the structured data had a positive effect as SEO. On the other hand, the structured data did not influence the company websites. This means the result on the pilot websites and that on the company websites contradict each other.

The committee formulated a hypothesis on this contradiction as follows.

Google has released its guidelines for using structured data. (*4) In the document, Google requires users not to include the structured data that are not visible on screen. In the above experiment, however, some letters were displayed as images and some items including tax rates or tax categories were not written on screen but written in the structured data. Therefore, these violations could have caused the lower valuation from

*2 https://gs1japanss.org/
*3 a brief description of the page displayed under the searched word (s)
*4 Structured Data General Guidelines
https://developers.google.com/search/docs/guides/sd-policies

Fig. 1.3.1-3 Effect of Presence/Absence of Structural Data on Search Ranking (Corporate Websites)

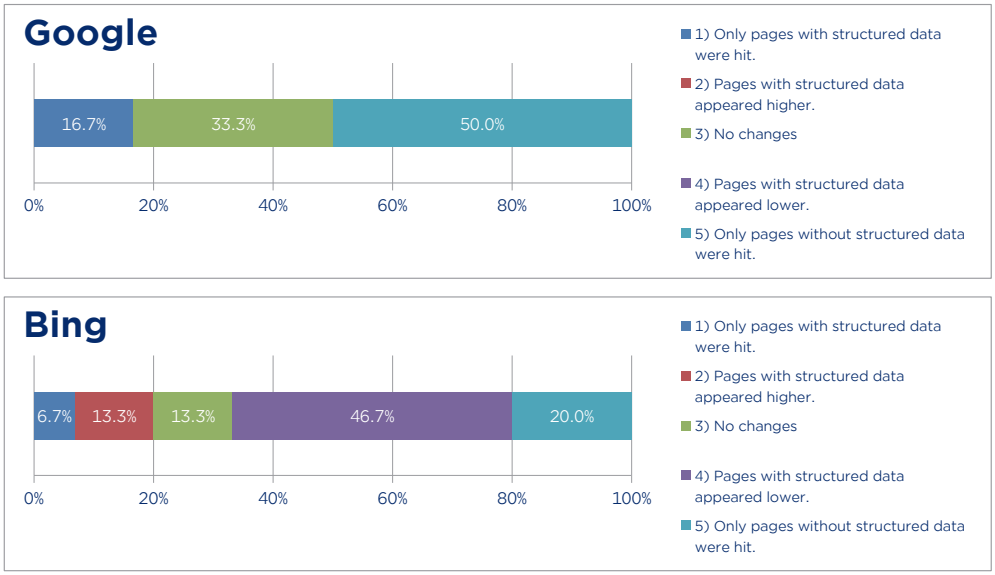


Fig. 1.3.1-4 Effect of Structural Data on Page Views before/after its Introduction (Company Websites)

	Number of Pages with structured data	PV	UU	Bounce Rate*	CVR
Company A	5 pages	107.1%	—	97.7%	81.7%
Company B	3 pages	86.0%	74%	—	—
Company C	3 pages	85.1%	—	82.2%	—
Company D	5 pages	97.7%	—	—	102.3%

*Bounce Rate: Percentage of people who left a webpage just after accessing it Values show the results of before/after Introduction of Structural Data Two products were excluded as their values had been fluctuated by sales promotion activities or seasonal factors.

the search engines as a penalty.

Next Step

As an additional pilot program, verification on the hypothesis that discrepancy between HTML and structured data caused negative impact on search rankings has been underway.
GS1 Japan will put genuine efforts to expand the domestic use of GS1 SmartSearch based on the above experiment results.

1.3.2 Business to Business to Consumer Service with GS1 QR Codes

Recently, the needs of providing multi-language product information to consumers have increased in the wake of a growing number of foreign visitors, spread of cross-border e-commerce and other circumstances. On the other hand, consumers also have become more influential amid expansion of Social Networking Services (SNS), which makes manufacturers more focus on preparing for unexpected recalls as well as securing the product safety. The government is currently under consideration to revise the Food Sanitation Act for introducing a reporting system of food recall/retrieval information adding to enhancing their food safety effort. To respond this trend, TDN International Ltd. (hereinafter called "TDN") released free app scodt®. This app leverages GS1 QR codes and enables manufactures to offer the product instructions, notices/recalls in multi-language. With the app, consumers can claim for recalls or repairs easily.

Overview of scodt®

TDN issues GS1 QR code for each product after registering the product information from the brand owners into its systems. GTIN (AI (01)) and URL (AI (8200)) are encoded into the GS1 QR code. The brand owners display those codes on their products.
Consumers can access detail information, user's guides, and websites in multi-languages by scanning the GS1 QR codes on product.
In addition, safety information can be provided: for example, the application notifies consumers with dates of required maintenance, the expiration date of proper use. If a product is recalled, the system sends push notification to the consumers who ever accessed the information of the recalled product through scodt®, in response to the request from the brand owner.

Fig. 1.3.2-1 scodt®

Use cases

A Japanese Sake Brewery

Hayakawa Brewing Co., Ltd. which was established in 1873, is based in Mie Prefecture, western Japan.
Recently, Japanese Sake is getting popular abroad. Many of 1800 or more Sake brewers in Japan tend to sell their products not for retailers/consumers directly. They depended on particular wholesalers to sell their product. Therefore, the brewers did not have to provide their product information to consumers, either.
However, this company recently thinks that it is essential to offer the detail information to foreign consumers in multi-languages. Therefore, Hayakawa Brewing decided to adopt scodt®.

A Cosmetics Firm

Figure 1.3.2-3 shows skin care products made from malted rice, which is used for brewing Sake. They are used being mixed with a little water.
By scanning GS1 QR codes on products through the application, the manufacturer can provide consumers with usage instructions in several languages including Japanese and Chinese.

Fig. 1.3.2-3 Skin Care Products with GS1 QR codes

Conclusion

To receive fair acclaim on a product from consumers, it has become more important to deliver them with the information about its correct usage. The consumers may want to know to-the-point information such as tips to appreciate their flavor, or foods that go with sake. In the field of cosmetics, it is important to offer the information about proper method for using.
Moreover, when a product is recalled, its manufacturer must provide the information to their customers, without delay.
In conclusion, offering more detailed product information with GS1 QR codes will offer new consumer experiences.

Fig. 1.3.2-2 Multi-lingual detailed product information on the app

2. Service & Solution

2.1 JICFS/IFDB (JAN Item Code File Service/Integrated Flexible Data Base)

Since 1988, GS1 Japan has been operating the JICFS/IFDB, database of product catalogues and collecting basic product attributes, e.g., GTIN, product names, product categories, weights, and amounts.
Product data are collected and arranged according to JICFS/IFDB standards and then supplied to retailers, wholesalers and other users via Data reseller (Fig. 2.1-1).
Figure 2.1-2 shows the number of the products registered in JICFS/IFDB. Approximately 20,000 new products are registered to the database every month. Most of the data registered in the JICFS/IFDB were related to food or commodity, but in recent years, the number of product data such as stationary, toys, durable consumer goods are increasing reflecting the increase of the products marked GS1 barcodes. Similarly, more variations are seen in the usage cases of product data in JICFS/IFDB. In the past, these data were mostly used in the field of business to business (B2B), i.e. to support retailers in creating the master data to introduce a point-of-sale (POS) system or an electronic ordering system (EOS), to suggest shelf allocation, and to set up a product master data for POS data analysis. Recently, however, usage for the field of business to consumers (B2C) is growing according to the increase of online shopping sites and consumer apps for panel search.
Since many stores on online shopping malls register the products information using their own codes and product names, the products are sometimes multiple registered under different names and categories. To

Fig. 2.1-1 JICFS/IFDB system flow

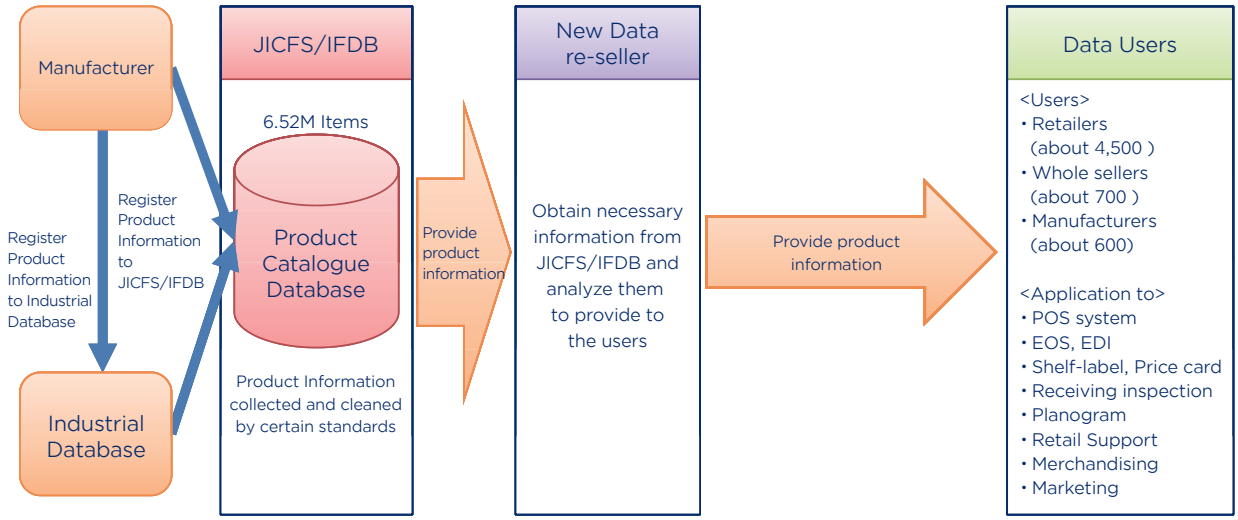


Fig. 2.1-2 Number of Registered Products

	2013	2014	2015	2016	2017
Food	1,209,636	1,291,008	1,371,489	1,465,218	1,544,912
Commodity	673,700	714,237	759,793	807,882	855,876
Recreation and Miscellaneous	417,922	453,135	492,503	532,678	575,471
Durable Goods	230,718	262,309	281,236	311,321	337,560
Apparel, Personal items & Sporting goods	222,660	245,395	270,240	301,951	331,360
Other	3,315	3,262	3,230	3,172	3,147
Active item Total	2,757,951	2,969,346	2,969,346	3,422,222	3,648,326
Inactive Data	3,104,154	3,104,154	3,104,154	3,104,154	3,104,154
Grand Total	**5,862,105**	**6,073,500**	**6,282,645**	**6,526,376**	**6,752,480**
Increase in number of items (year-on-year)	202,778	211,395	209,145	243,731	226,104
Rate of increase (year-on-year)	103.58%	103.61%	103.44%	103.88%	103.46%

solve this problem, several companies operating online shopping malls use GTIN for product information control.
Data collection applications for panel research use the product information of JICFS/IFDB as the fundamental data which assists each user (consumer) to input merchandise information that the user purchased into the application. One typical usage example is as follows; A user scans a barcode on a product they purchased with their smartphone camera. Then, the app automatically shows the user the product name and product category if the product data is registered in JICFS/IFDB and collects the merchandise information at the same time.

The product information in JICFS/IFDB includes JICFS - classification codes (Fig. 2.1-3) that indicate product categories. These codes are used as search keys for extracting the necessary product groups, and as aggregate keys for grouping similar products for data analysis.

Fig. 2.1-3 JICFS Classification Code System <Example: 110109: Salt>

Food	Processed Food	Seasonings	Table Salt
(Large Category)	(Middle Category)	(Small Category)	(Fine Category)
1	1	01	09

The JICFS - classification is revised as necessary.
In March 2014, minor changes were made for OTC (Over the Counter) drugs. Revision of the JICFS - classification for confectionary is also being discussed now, together with confectionary industry associations.

2.2 GEPIR

GEPIR (Global Electronic Party Information Registry) is a unique, internet-based service that gives access to basic contact information about GS1 Company Prefix licensees. Since 2003, GS1 Japan provides the GEPIR service in Japanese on the GS1 Japan website.

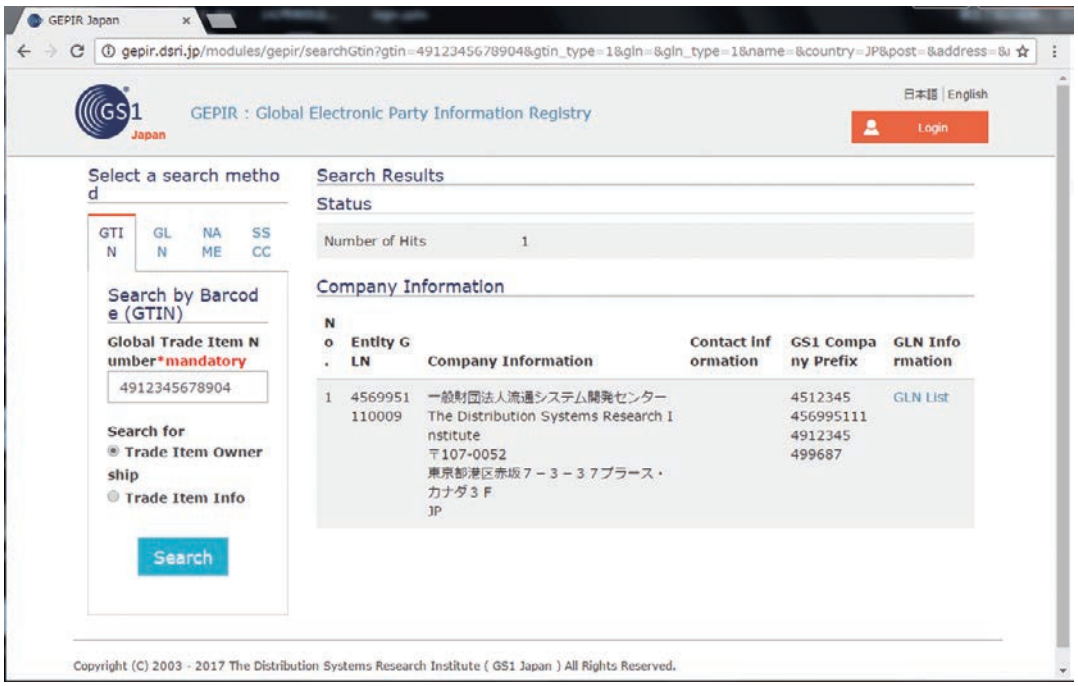
In 2007, a GLN location search function was added to the GEPIR by GS1 Japan, followed by GTIN information display services in 2013. In March 2017, the upgrade to GEPIR version 4.0 was completed.
GEPIR version 4.0 is able to search basic GS1 Member Companies' information by company name, GTIN, GLN, SSCC and other GS1 identification Keys.

Currently, GEPIR is used by many companies, with more than 2 million accessing the service annually.

2.3 GPC Translation and OECD product recall portal

Global Product Classification (GPC) is a product classification developed and managed by GS1. GPC is a

Fig. 2.2-1 GS1 search results of company information



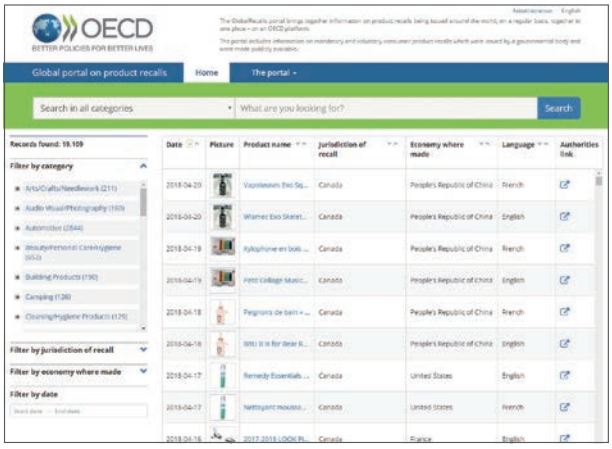
required attribute when registering product information into data pools of Global Data Synchronization Network (GDSN). As of December 2017, the development of 38 broad categories including Food/Beverage/Tobacco, Kitchen Merchandise, Beauty/Personal Care/Hygiene, and Pet Care/Food have been completed and released on the GS1 website (http://www.gs1.org/gpc).

Multilingual access has been progressing, with translations into 19 languages, including Japanese, which are available for viewing on the GS1 website. Recently, there has been a move to use GPC for other purposes than GDSN. The OECD- managed recall portal website has adopted GPC for its product categorization. The aim of this portal site is to facilitate efficient sharing of international product safety information in multiple languages, as a response to current trends in global trading. The portal site started operation in October 2012 in English and French with the participation of U.S., Australia, Canada, and EU countries. Japan also began participating in January 2015, providing product-recall information of Japanese products, as well as adding a link to the Japanese-language version on the top page of the site.

In response to that move, GS1 Japan translated all 38 segments of the December 2017 version of GPC into Japanese.

We expect the use of GPC to expand in the future as more OECD-member nations start providing recall information on this portal site.

Fig. 2.3-1 The GlobalRecalls portal showing Japanese products subject to recall.



Source : http://globalrecalls.oecd.org/

2.4 Ryutsu BMS (Business Message Standards)

The use of EDI in the retail sector in Japan started with the Electric Ordering System (EOS) using the JCA Protocol (*1), a standard data communication protocol drawn up in 1980 by the Japan Chain Stores Association (JCA). In the 1990s and thereafter, EDI also came to be adopted for business processes other than ordering. Furthermore, in the 2000s, based on Efficient Consumer Response (ECR) and Quick Response (QR) procedures, Ryutsu (*2) Business Message Standards (known as Ryutsu BMS) were established for the purpose of achieving improved information sharing between retailers and suppliers.

2.4.1 Development of Ryutsu BMS

The JCA Protocol drawn up in 1980 became widespread as an EOS for retail businesses.
In 1990s, the business procedures covered by EDI expanded from the EOS to the shipping and receiving of goods, invoicing and payments. However, from the late 1990s to the early 2000s, the following problems with the system were identified:

- Low speed
- Inability to deal with Kanji characters and images
- The necessary communication equipment was discontinued
- Difficulty in adding new data fields due to a fixed-length data format
- Message formats that differed from retailer to retailer

Concerned about this situation, Japan's two supermarket organizations agreed to cooperate and started to develop a next-generation EDI in June 2005. With the support of METI (Ministry of Economy, Trade and Industry), Ryutsu BMS were created as the new EDI standard in April 2007. Ryutsu BMS is now being increasingly adopted throughout the Japanese retail industry.

2.4.2 Outline of Ryutsu BMS

Ryutsu BMS defines the following:

Communication infrastructure
There are three standard communication protocols for exchanging Ryutsu BMS messages;

- Server-to-Server Protocols: ebMS and AS2

*1 JCA Protocol
This is the standard communications protocol for electronic ordering, established in 1980 by the Japan Chain Stores Association (JCA). The communication circuits available for the protocol are public circuits (2,400 bps) and DDX circuits (9,600 bps), and it cannot transmit Kanji and images. DDX circuits are packet-type communication services that use telephone circuits.
*2 Ryutsu
Ryutsu is the Japanese equivalent of a supply and demand chain, which typically consists of three groups; Manufacturers, Wholesalers and Retailers.

• Client-to-Server Protocol: JX Protocol (*3)
In addition, guidelines for secure internet communications are prepared, and the use of certificate authority that meet the guidelines is recommended.

Standard Messages
There are 2 types of messages:
• Basic messages
Intended for use at supermarkets, drugstores, etc., the 27 basic messages were published based on the Order to Cash business model. In 2010, retailers and the apparel industry worked together to develop a system of peer-to-peer product information data messages.
• Department store messages
Japanese department stores have unique transaction models, which are different from those of other retailers. For example, they register a merchandise purchase when the merchandise has been actually sold; and also they need to manage the pre-ordering of seasonal gifts for the Japanese custom of giving gifts twice a year (in the summer and at the year's end). Therefore, the department stores use 27 unique messages in their transactions.

2.4.3 Efforts to promote Ryutsu BMS

GS1 Japan, together with the Supply Chain Standards Management & Promotion Council (see 3.2), has taken various efforts to encourage the wider use of Ryutsu BMS.

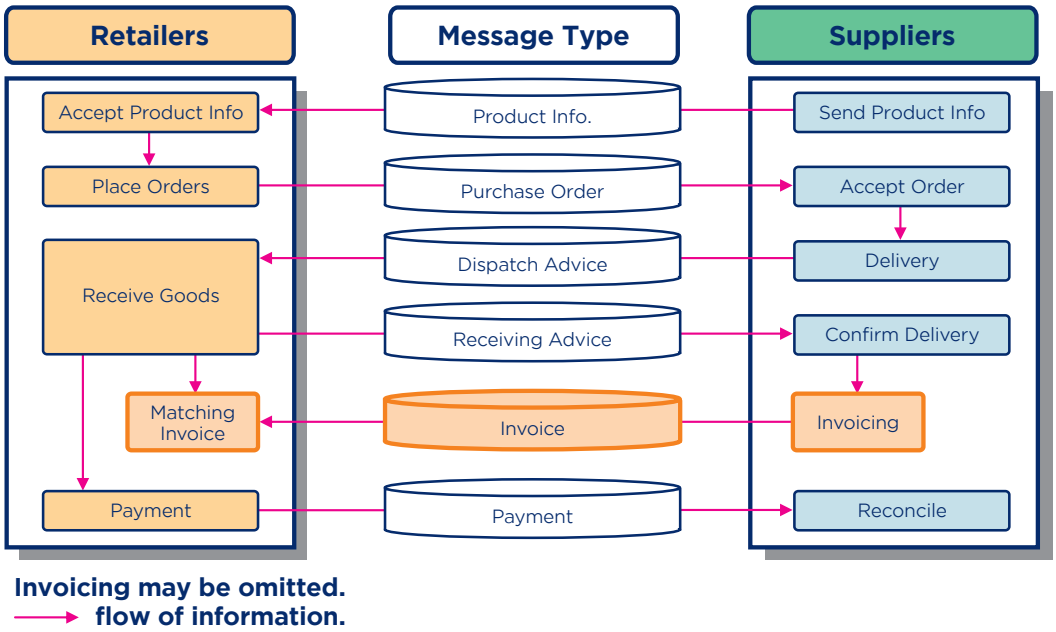
• Trainings and seminars:
GS1 Japan has offered a wide range of training courses ranging from introductory to advanced implementation courses. Some of these courses have been provided as e-learning. We also hold seminars to introduce the best practices to Ryutsu BMS users and solution providers.

• Promotional materials:
Flyers, brochures and videos have been made available to anyone interested in Ryutsu BMS. We also have an Ryutsu BMS dedicated website, which is kept up-to-date.

2.4.4 Users' commitment to Ryutsu BMS

According to a survey conducted by GS1 Japan, 198 retailers and 227 wholesalers or manufacturers have already adopted or intend to adopt Ryutsu BMS. The details of this survey are described in Fig. 2.2.4-1.

Fig. 2.4.2-1 Typical Turnaround Business Processes and Ryutsu BMS Messages between Retailers and Suppliers



*3 JX Protocol
This is the communications protocol for transmitting messages from a client terminal to a corresponding server on a TCP/IP network. Using the international SOAP-RPC standard, the protocol realizes functions that are equivalent to those of the J Protocol. The JX Protocol has become a standard communications protocol for exchanging EDI messages between clients and servers in Ryutsu BMS.

Fig. 2.4.4-1 Number of Companies with their Names Made Public (As of Apr, 2018)

Retailers

Classification	Implemented	Planning to Implement	Subtotal
1. Supermarket	134	14	148
2. Department Store	9	2	11
3. Drug Store	25	0	25
4. Home Improvement Store	4	0	4
5. Co-operative Federation	4	0	4
6. Storage-type Membership Store	1	0	1
7. Voluntary Chain Headquarters	1	0	1
8. Discount Store	4	0	4
Total	**182**	**16**	**198**

Wholesalers/Manufacturers

Classification	Implemented	Planning to Implement	Subtotal
1. Food/Beverage Wholesaler	57	0	57
2. Confectionary Wholesaler	21	4	25
3. Daily Goods/Cosmetics Wholesaler/Manufacturer	27	0	27
4. Medical Goods Wholesaler/Manufacturer	6	2	8
5. Apparel/Shoes/Sports Goods Wholesaler/Manufacturer	29	8	37
6. Food Manufacturer	31	2	33
7. Household Goods Wholesaler/Manufacturer	10	1	11
8. Packaging Materials/Secondary Materials Wholesaler/Manufacturer	15	7	22
9. Toys/Hobby Goods Wholesaler/Manufacturer	3	0	3
10. Home Electric Appliances Wholesaler/Manufacturer	2	0	2
11. Other Wholesaler/Manufacturer	2	0	2
Total	**203**	**24**	**227**

2.5 Mobile app: GS1 Japan Scan

GS1 Japan Scan: Background of the Development and its Purpose

In Japan the use of the GS1 standards has been spreading to various industries including healthcare and food raw material sector. In these industries detailed product information including expiration date, batch/lot numbers along with GTIN, is encoded in barcodes. This benefits consumers' safe use of the product, and enables secure traceability, etc.

Using barcode symbols following the GS1 standards are essential to share various information correctly among trading partners. In the market, however, there still are barcode symbols that do not meet GS1 standards, as well as software and devices that do not correctly detect/process the GS1 standard. This is because not only a lack of understanding of GS1 standards, but also a shortage of the tools with which barcode symbols can be checked easily. Therefore GS1 Japan introduced a new smartphone application called "GS1 Japan Scan" that allows users to carry out a simple check of their products' barcode on the go if it meets the GS1 Standards' requirements. The application has been developed to promote the usage of the GS1 standards and prevent issues related to misunderstanding of GS1 standards.

Expected Usage and Advantages of GS1 Japan Scan

1) Allow person in charge of designing or printing of barcode labels easily check created barcodes.
2) Allow person in charge of receiving goods promptly identify the cause of the problem that occurred during barcode scanning (e.g. an incorrectly encoded barcode symbol, a fault of a barcode reader or in the software of the receiving control system).(*1)
3) Easily demonstrate the advantages of using the GS1 system.

*1 Its function is limited to the checking of data items, the print quality of bar codes is not assured. The printing quality needs to be checked by a barcode verifier.

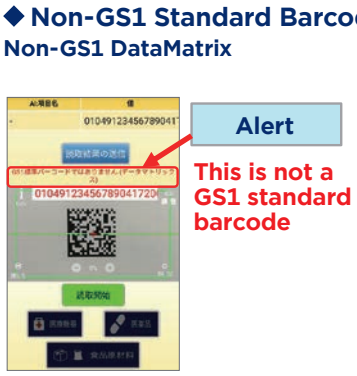
Basic function of GS1 Japan Scan

1) Scan a barcode symbol.
2) Confirm whether the symbol is GS1 standard barcode.
   For example:
   EAN/UPC symbol?
   GS1 DataMatrix or non-GS1 DataMatrix?
3) Display data items with their application identifiers.
   For example:
   (01) → GTIN (Global Trade Item Number)
   (17) → Expiration date
   (10) → Batch or Lot number
4) Check if the barcode conforms to the industry rules, for example, medical devices, pharmaceuticals, food raw materials.

How to use GS1 Japan Scan

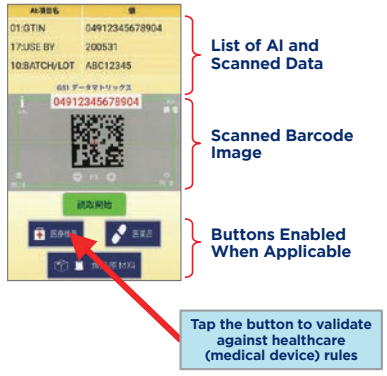
Figure 2.5.1-1 through Figure 2.5.1-4 illustrates how GS1 Japan Scan works.
Figure 2.5.1-1 is a screenshot of capturing and decoding a barcode symbol. If the barcode is not a GS1 barcode, the application prompts with an alert.

Fig. 2.5-1 Results Example



If the barcode is a GS1 barcode, the application shows sets of AI and data items and barcode image. Also the check-by-industry buttons will be enabled.

Fig. 2.5-2 Displaying scanned data items

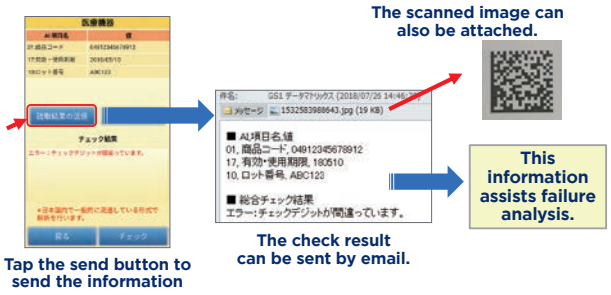


Tapping these buttons, users can check if the barcode conforms to the industry rules. At the moment 3 buttons (medical device, pharmaceuticals and food raw materials) are available. Following screenshot (Figure 2.5.1-3) suggests that necessary information for medical device are encoded that “All good” is displayed, meaning that there are no issues with this GS1 DataMatrix symbol.

Fig. 2.5-3 Check Result: example of Medical Device

This application has a very useful function to share information, which assists the analysis of scanned data (see figure 2.5.1-4). Users can email information such as AI, data items, image of a barcode, data verification report , which help them with analyzing failures.

Fig. 2.5-4 Information Transmission Function



Conclusion

GS1 Japan will continue to improve the application by gathering users’ feedback. We are committed to expanding the usage of this application to promote the proper understanding of GS1 standards, and the widespread use of barcode symbols that conform to GS1 standards.

2.6 Multilingual product information service

As the secretary of The Collaborative Council of Manufacturers, Wholesalers, and Retailers (*1), GS1 Japan has been working on a project to create a multilingual product information service for foreign visitors to Japan.

Background and objectives

The number of foreign visitors to Japan reached 24 million in 2016 and the Japanese government set a target to increase to 40 million by 2020. However, there are a growing number of foreign visitors who feel dissatisfied or anxious when they shop in Japan since many products have information only in Japanese.
To address this situation, in FY2016 the council started a project to establish a system to offer foreign visitors accurate product information, which is provided by the brand owners in various languages such as English, simplified and traditional Chinese, and Korean through a smartphone application. Upon seeing the results of this project, GS1 Japan launched its multilingual product information service in 2018.

Service overview

With this service, when foreign visitors scan the EAN/UPC symbol on a product using their smartphones, its product information (including GTIN) will be displayed on the screen in one of multiple languages according to the language configuration of the phone. GS1 Japan is in charge of managing the multilingual product information data pool (DP) and the smartphone application called Mulpi (Multi-language product information).
The user experience of the multilingual product information service is as follows.

1) When a user scans the barcode on a product using a smartphone, its basic product information including GTIN, product name (*2), image, and category name will be shown on the screen in a selected language. If there is a product website prepared by the brand owners, Mulpi automatically displays the webpage.
2) As a communication infrastructure for accurate product information provided by each brand owners, the multilingual product information DP will be working with other applications provided by related service providers. GS1 Japan plans to provide support to participating companies to create multilingual product information web pages in cooperation with translation agencies.

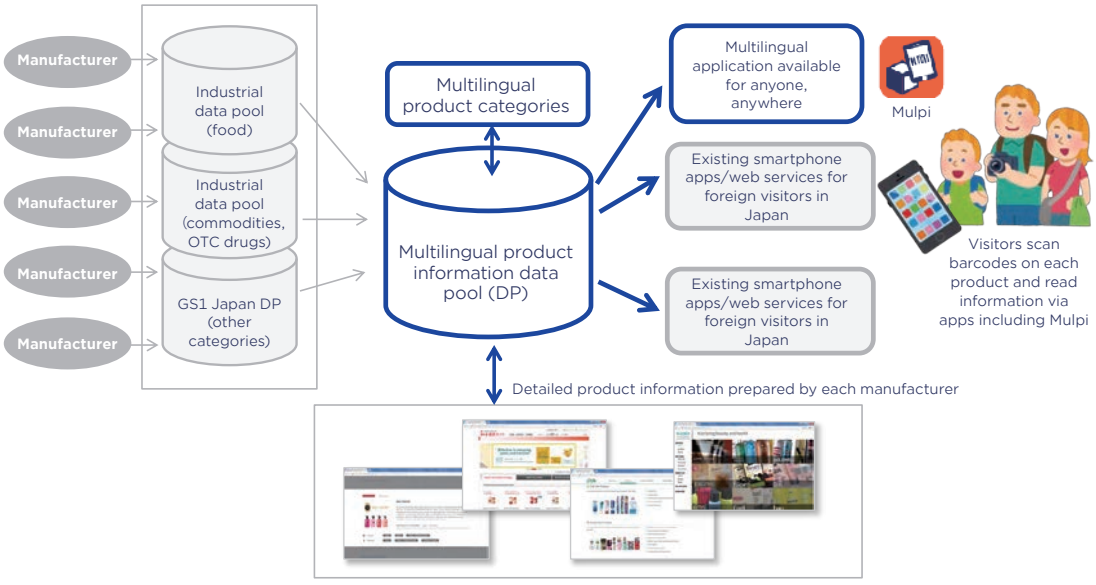
Expected results

Expected results of this service are:

◇Brand owners will:

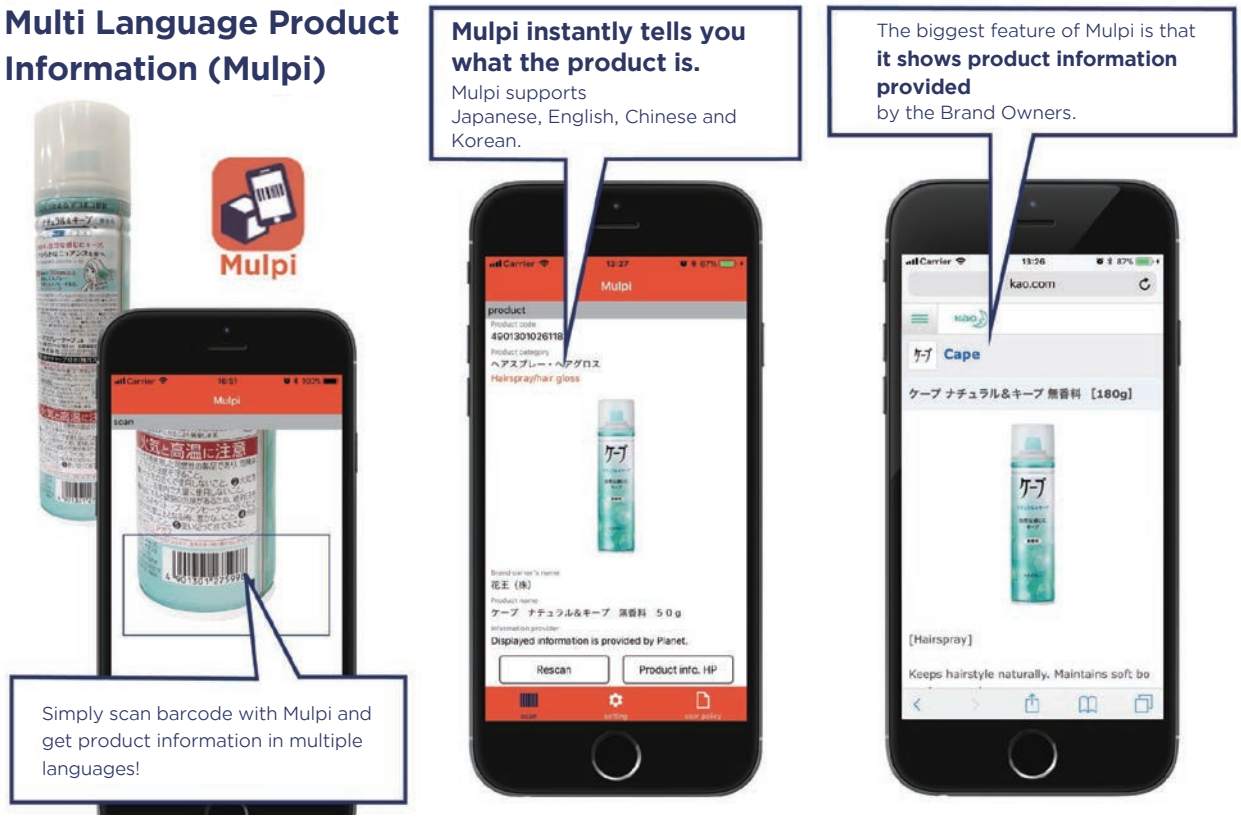
＊attract more visitors with increasing accessibility to product information pages on their website.

Fig. 2.6-1 Overview of the multilingual product information service



*1 The council was established in collaboration with manufacturers, wholesalers, and retailers of consumer goods, aiming to promote significant innovation and improvement of the supply chain management and to enhance the industry's competitiveness for contribution to better people's lives. As of December 2016, 22 manufacturers, 9 wholesalers and 22 retailers have joined this council.
*2 Product Names are in Japanese.

Fig. 2.6-2 The multilingual product information service



＊provide accurate product information at lower cost.
＊be able to promote sales of their products through the service.
＊be able to present information such as the correct way of ingestion, intake, and usage through the service.
＊no longer need to respond to individual customers' multilingualization demand.
＊be able to gather the access logs (reference) to their detailed product information to use them for their marketing activity.

◇Retailers will:

＊be able to support the shopping experiences of foreign visitors at a very low cost by using the shared infrastructure of the service.
＊be able to promote instore sales to foreign visitors.
＊no longer need to individually set up and manage systems for multilingualization of product information of instore items.

◇Foreign visitors to Japan will be able to:

＊have a better understanding of Japanese products at shops, which will make it easier for them to purchase what they are interested in.
＊easily obtain accurate product information provided by the brand owners in their preferred languages through the applications working with the service.
＊check the information outside Japan.

Future plan

As a part of the effort to assist the shopping experience of foreign tourists visiting Japan during the 2020 Tokyo Olympics and Paralympics, GS1 Japan plans to increase the number of products registered on the service and accelerate wider use of the application.

3. Community Engagement and Standard Implement

3.1 GS1 Japan Partners

In April 2015, GS1 Japan launched the program "GS1 Japan Partners", mainly for solution providers. This program aims to share information on the latest trends and cases of systematization, while promoting the systematization of information and efficiency in the overall distribution industry with use of GS1 standards. The number of members in fiscal year 2017/18 is 120, including many of the major solution providers in Japan. (Fig. 3.1-1)

Fig. 3.1-1 Membership Structure (as of March 2018)

Sales	Number of Members
Less than 1 billion yen	50
1 billion – 10 billion yen	29
10 billion – 1 trillion yen	38
1 trillion yen and above	3
Total	**120**

Fig. 3.1-2 Events in Fiscal Year 2017/18

July 2017	EPC/RFID Seminar	• Trend and usage examples in apparel and retail industries • Basics of EPC/RFID and its latest examples • Tagged-Item Performance Protocol (TIPP) • Traceability, sustainability, corporate social responsibility (CSR) and other topics
July 2017	1st Regular Seminar	Global trend of EPC/RFID: GS1 Connect and RFID Journal Live! Supply chain in apparel industry: Test report of usage of RFID in the field of logistics Use of information technology in supply chains based on RFID
Nov. 2017	2nd Regular Seminar	Recognition of things and visualization of their traffic using GS1 standards Proper deployment of traceability in actual operation at hospitals and the role of GS1 Expectation on spread of the technologies required in using the bar codes that conform to GS1 standards
Nov. 2017	Site visit	EPC/RFID in gas industry
Jan. 2018	3rd Regular Seminar	Striving for optimization of supply chains Current status of automation in the field of logistics and other topics
Mar. 2018	4th Regular Seminar	EDI Development for Financial Sector: effective use for streamlining operations of payment and settlement and enhancing productivity in companies Handling of reduced tax rates in EDI and other topics

3.2 Supply Chain Standards Management & Promotion Council

Supply Chain Standards Management & Promotion Council was founded in April 2009 by various industry groups and businesses to help promote efficient supply chain information system in Japan's retail sector.
The activities of the council include maintaining and promoting Ryutsu BMS (see2.4), which was initially developed with the support of the Ministry of Economy, Trade and Industry. At present, GS1 Japan acts as the secretariat of the council.
The Council held its inaugural General Assembly in Tokyo in April 2009. The council consists of trade associations of manufacturers, distributors and retailers in the consumer goods industry as full members. As of January 2018, the council has 49 full member organizations. In 2017, the council is being operated with the following structure:

Organizational structure

(1) General Assembly
Once a year the Council holds a general assembly at which it approves the results of activities of the previous year as well as the new agenda for the next year. The officers of the council are also appointed at the general assembly for two-year terms.

(2) Executive Committee
The role of the executive committee includes making important decisions on the council's management, such as admitting new members, establishing and abolishing working groups, and appointing working group members. In 2017, the committee is composed of representatives from 15 full member organizations.

(3) Working Groups
The Council has three working groups as follows (See Fig. 3.2-1).

1) Message Maintenance Working Group
   This group maintains and manages Ryutsu BMS messages and various guidelines. The work is done in response to requests from full members for changes or additions to the established standards. The group examines such requests, decides on the steps to be taken, revises the relevant guidelines and publishes new standards. In 2012, the group set the standard for product images (image size, resolution, filenames etc.) for online supermarket and published a guideline.

2) Technical Specification Working Group
   This group maintains and manages the guidelines for network technology and information processing technology used for exchanging the standard messages of Ryutsu BMS via communications circuits.

3) Promotion Working Group
   This group examines and implements steps to encourage wider adoption of Ryutsu BMS among SMEs. The group also monitors “off the standard usage” of Ryutsu BMS.

Activities for promotion and increasing adoption

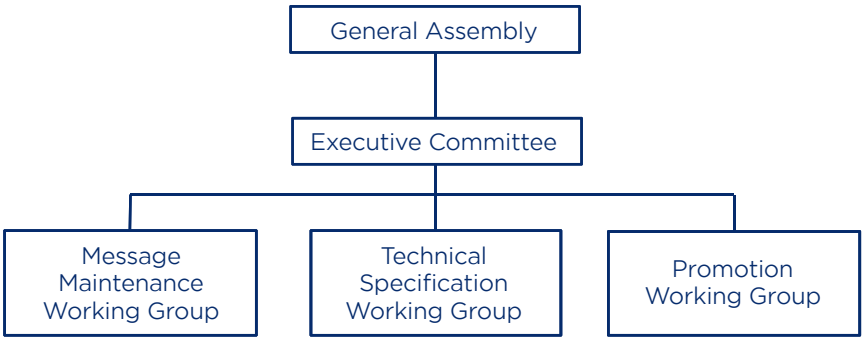
GS1 Japan and the council take various efforts to encourage wider use of the Ryutsu BMS. For details see 2.4.

Registration of Ryutsu BMS trademark

GS1 Japan has registered Ryutsu BMS logo to be used for products and services that comply with Ryutsu BMS specifications. As of March 2018, there are 116 products accredited and permitted to use the logo.

Fig. 3.2-2 Ryutsu BMS logo

Fig. 3.2-1 Organizational Structure of the Council



3.3 GS1 Healthcare Japan

GS1 Healthcare Japan is a voluntary group that is made up of domestic medical institutions, pharmaceutical and medical devices manufacturers, wholesalers and solution providers. The group works with GS1 Healthcare, the Ministry of Health, Labour and Welfare and other organizations to promote standardization in order to ensure patient safety, secure traceability, and enhance the efficiency of distribution and medical management in supply chain.

As of January 2018, GS1 Healthcare Japan consists of 106 members.

Activities

Within GS1 Healthcare Japan, members are actively engaged in the following three groups; the International Standards and Regulations Study Work Group, the Medical Solutions Study Work Group and the Planning and Public Relations Group.

Activity of Each Work Group

International Standards and Regulations Study Work Group

- Research on the trends in international regulations and standardization

Medical Solutions Study Work Group

- Promotion of measures to improve safety and the supply chain efficiency in the medical industry

Planning and Public Relations Group

- Promotion of GS1 standards to medical institutions.

Topics in 2017/18

In the fiscal year 2017/18, GS1 Healthcare Japan actively promoted the use of GS1 standards in medical institutions.
In the conference for operating technology held in Tokyo, GS1 Healthcare Japan opened a booth and introduced GS1 Standards to medical staffs. More than 100 people came by the booth in 2 days and they became interested in GS1 barcodes. GS1 Healthcare Japan participated in other medical conferences to give presentations about the value of GS1 standards.

In March 2018, an open seminar was held following last year. Medical professionals who used GS1 barcodes on medical devices and drugs gave lectures on their cases and the benefits they derived. More than 250 people attended the seminar including medical staffs, medical device/drug manufacturers, and wholesalers. According to the results of the questionnaire survey on the seminar, every lecture was informative to implement GS1 barcodes in medical institutions and most of the attendees were satisfied with the seminar.

Fig. 3.3-1 GS1 Healthcare Japan Booth

Fig. 3.3-2 Open Seminar

3.4 ICT-Oriented Wholesale Industry

In 1985, GS1 Japan set up a study group aimed at promoting the computerization of the wholesale industry, with GS1 Japan as the secretariat of the group. In Japan's supply chain system, wholesalers play a major role, as most manufactured products are delivered to retailers through wholesalers.

The study group is operated primarily by wholesalers dealing in Fast Moving Consumer Goods (FMCG) in different industries (foods, pharmaceutical products, etc.), and the membership is currently about 48 companies.
The group is further divided into several sub-working groups, according to themes related to the members' interests, and each sub-working group holds monthly meetings. Other activities of the study group include an Annual Forum, which is the biggest event, and a "future solution study tour".

With its mission of "Initiatives toward total optimization

of Japanese distribution",
the study group worked on the following 5 topics in FY2017.

- Promotion of the Ryutsu business message standards (BMS): improvement in recognizing the 2020 problem (*1)
- Response to reduced tax rate system
- Cost reduction by improvement of distribution centers
- New information technologies utilization for "sales expansion"
- Addressing labor shortages with new information technologies

Fig. 3.4-1 ICT-Oriented Wholesale Annual Forum

3.5 The Collaborative Council of Manufacturers, Wholesalers, and Retailers

The Collaborative Council of Manufacturers, Wholesalers, and Retailers was formally established in May 2011 for the purpose of improving the nation's industrial competitiveness, and of contributing to an affluent standard of living for the nation's citizens, through extensive innovations and improvements in supply chain management. The Council's Vision states the objectives of the activities of this collaboration by the retail supply chain stakeholders. Member companies can participate in the Council based on their endorsement and support of the Vision by their executive management, and an agreement to act while upholding the Vision.

GS1 Japan, and the Distribution Economics Institute of Japan, jointly serve as the Secretariat of the Council. Under the auspices of both Institutes, 15 founding member companies have participated in the Council, and have continued to hold preparatory meetings since May 2010. They have discussed the adoption of the Vision and how to manage the full-scale activities of the Council with the active support of the Ministry of Economy, Trade and Industry (METI). They have also established working groups and continued discussions on three specific themes: "Reducing Returns"; "Optimizing Deliveries"; and "Promoting the Introduction of a new EDI standard known as Ryutsu BMS". In May 2011, the founding companies announced the formal establishment of the Council in the "Collaborative Forum of Manufacturers, Wholesalers, and Retailers".

In FY2017, The council is committed to further discussions of the theme of "Optimization of Logistics", organizing its past deliverables, and sorting out common challenges to be shared among manufacturers, wholesalers, and retailers. Meanwhile, through the Product Information Multiple Languages project, which has been promoted since FY2015, the data pool and the application for mobile devices were developed for practical use based on the knowledge obtained through the past demonstration experiments. They have been released in March 2018. (For further information, refer to 1.5.1)

The Council reported its output at the "General Meeting" and The Collaborative Council of Manufacturers, Wholesalers, and Retailers now has a four-tier structure consisting of a general meeting, strategic meeting, steering committee, and working groups.

"The Forum of the Collaborative Council of Manufacturers, Wholesalers, and Retailers" will be held in July 2017. The executive management of each company has confirmed the responsibility for their activities, and will lead specific on-site improvements and innovations within the company.

Fig.3.5-1 General Meeting and Forum of The Collaborative Council of Manufacturers, Wholesalers, and Retailers

*1 It is planned to shift Japan's telecommunication lines from analog lines to an IP network in 2021. Companies using analog lines need to be prepared for the shift by 2020.

3.6 Information Systems in Food, Beverage, and Alcohol Industry

This is a voluntary study group of liquor and processed food businesses established in 1983 with the aim of studying the most appropriate information systems for use between food producers and wholesalers. It is important for members to cooperate with wholesalers, as they are positioned between retailers and product manufacturers.
The study group has about 60 corporate members that are representative of Japan's processed foods, marine products, and liquors businesses. GS1 Japan serves as the group's secretariat.

The study group conducts joint studies on new issues concerning standardization of B2B data exchanges among companies in the supply chain. It holds regular meetings four times a year where best practices are introduced. It also organizes seminars on the latest topics by invited outside lecturers and study tours to pioneering businesses. The group also serves as a place for gathering and summarizing the opinions of those in the industry.

Fig. 3.6-1 Regular meetings

3.7 User support

For better understandings of GS1 standards, GS1 Japan offers users both various classroom style courses and distance e-learning courses. Followings are offered as scheduled courses:

- Introduction to Barcodes
- Introduction to EPC/RFID
- Introduction and Implementation of Ryutsu BMS
- Introduction to Barcode for Prescription Drugs and Medical Devices

3.7.1 Introduction to Barcodes

This scheduled program offers basic knowledge on GS1 barcodes accelerating GTIN usage and application. Classroom locations are Tokyo and Osaka and participants, mostly new members who want to learn about barcodes from the basic and to know how to display barcode to products, are expected to obtain general knowledge of barcodes. "On-site training" is also available accordingly upon applicant's request at specified place and time.
In addition to the classroom courses above, e-learning program was introduced in 2016 enabling learners free from location and time constrain.

Fig. 3.7.1-1 Classroom of "Introduction to Barcodes"

3.7.2 Introduction to EPC/RFID

This program targets EPC/RFID beginners in order them to obtain deeper understandings of the approach of its utilizations. Classroom locations are Tokyo and

Fig. 3.7-1 GS1 Japan Seminar Statistics in 2017

Courses	# Courses	# Attendees
Introduction to Barcodes	24	729
Introduction to EPC/RFID	5	190
Introduction and Implementation of Ryutsu BMS	10	238
Introduction to Barcode for Prescription Drugs and Medical Devices	6	150

Osaka, and participants are expected to learn about those characteristics of RFID, successful implementation case examples of EPC/RFID systems, GS1 EPC/RFID standards, and other related information. After the lecture sessions, a demonstration is carried out simulating shipping and receiving item check, conducting RFID batch reading. Participants can also get hands-on experience of the simulation.
E-learning is also available with the title of "Guide to EPCIS System Construction," which is helpful for EPCIS system construction.

3.7.3 Introduction and Implementation of Ryutsu BMS

The program "Introduction of Ryutsu BMS" is to explain EDI from basics through to Ryutsu BMS outline, consequence of implementation and more.

This program is intended for persons related to CPG supply chain, especially toward to persons assigned newly to information system department, or considering Ryutsu BMS introduction. In addition, it is also useful for solution providers or consultants to support user companies.

Main classroom locations are Tokyo and Osaka, and its e-learning version was launched in May 2017.
Next step program is also prepared as e-learning explaining key points how effectively introduce Ryutsu BMS complying with the standard specifications under the title of "Ryutsu BMS Implementation Course."

3.7.4 Introduction to Barcode for Prescription Drugs and Medical Devices

This program provides practical knowledges about the guidelines released by the Ministry of Health, Labour and Welfare (MHLW), which specifies barcode marking rules for prescription drugs and medical devices. This program is designed for the people who are working at drug or medical device manufacturers, wholesalers, medical service providers and related solution providers, and the classroom is scheduled regularly in both Tokyo and Osaka.

3.7.5 Junior Intern

Another but not least unique activity from GS1 Japan is the "Junior Intern" for middle and high school students. Throughout the several hours of lectures and trainings, the future GS1 users learn about barcodes and GS1 standards.
This program is supported by "Specified Non-profit Corporation - School Support Center" as one of their school support activities.

Fig. 3.7.5-1 Students learning and experiencing scanning barcodes/RFIDs

3.8 Publications

GS1 Japan has been delivering information regarding case studies utilizing GS1 standards to retailers, wholesalers, products manufacturers, and Solution

Fig. 3.8-1 Guide to Barcodes for Beginners

Fig. 3.8-2 BarcodeGuideline for UDI

Fig. 3.8-3 Revised Version of GTIN Allocation Guidelines

Fig. 3.8-4 Source Marking Guideline for Raw Materials

Providers. The information are published, and most of materials are also available on our website in order to promote GS1 standards . Followings are the examples of our current printed publications:

Addition to the above, we also issue two periodical publications that, in each issue, deliver information on the latest trends in distribution information systematizations, such as the GS1 Standards systems, barcodes, EDI, SCM, GS1 EPC/RFID and databases, as well as trends of industry standardizations, policies, and international standardizations.
Moreover, GS1 Japan creates educational videos including “Basics of JAN Code: JAN Code, Product Code for Assembled Packages,” “GS1-128 Barcode GS1 DataBar: Barcodes Containing Various Information,” “GS1 EPC/RFID Standards,” “Simple Scan for healthcare” and “Ryutsu BMS, the Foundations of Growth.”
Besides the above videos, we also created many other informative educational videos which are mostly used during classroom programs. All the videos are available either on our website or DVDs.

3.9 Event

GS1 Japan organizes and sponsors various events. Major events are explained here below.

3.9.1 GS1 Japan Annual Seminar

The FY 2017 annual meeting to exchange information was held on December 7th at Meiji Kinenkan, with nearly 300 participants from various organizations and firms. At the beginning of the meeting, Tsuneo Okubo, the chairman of Retail Science co., Ltd. and the former president of Seijo Ishii co., Ltd., gave a special presentation. He stated that the retail business is, through the AI revolution, becoming a customer-centered marketing business, a leader of the omni-channelized distribution structure, and a value creator.

And he added that stores are being turned into hubs for creating and providing value, adding that the position of the retail business as a human-centered industry will not be changed.

3.9.2 GS1 B2C (Mobile) Seminar

This seminar shares trends of GS1 standardization activities and excellent use cases of leading domestic and foreign companies, and is targeted to mobile marketing professionals in manufacturing and retail, and to system planners and developers of mobile devices including software services. The theme of GS1 B2C (Mobile) Seminar 2018 was “Omni-channel environment business innovation utilizing GS1 Standards - GS1 Standards implementation trends for brick and click,” and number of participants was counted to about 100.

Fig. 3.9.2-1 GS1 B2C (Mobile) Seminar

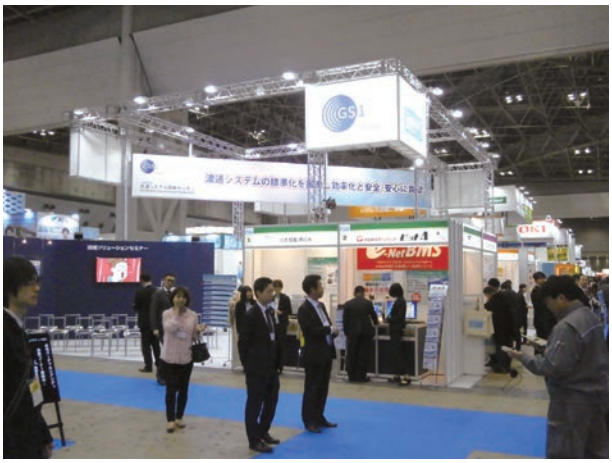
3.9.3 EPC/RFID FORUM

GS1 Japan and the Auto-ID Laboratory Japan (Keio University) have jointly hosted this periodic forum, aiming to promote widespread use of EPC/RFID systems and to encourage the appropriate usage of it.

In July 2017, the 13th forum titled “Efforts for Spreading the Use of Individual Product Tags (EPC/RFID):

Fig. 3.9.3-1 Panel discussion (left) Mr. Markus Müller (right)

Fig. 3.9.4-1 Booth of GS1 Japan (left), GS1-hosted seminar (right)



Activities of METI and Convenience Stores, and Overseas Trends" was held with a record high attendance of some 350 participants. In this forum representatives of METI, convenience stores, and suppliers, gave a presentation regarding the METI-led RFID project in convenience stores, each from their own different perspective. Also, a panel discussion was conducted at the end of the forum. GS1 invited Mr. Markus Müller as a guest speaker, he gave a lecture regarding the current situation of RFID usage overseas, and described examples in the apparel and general merchandise businesses.

3.9.4 RETAILTECH JAPAN 2018

GS1 Japan provided a special collaboration with "RETAILTECH JAPAN," a major exhibition which is held in March every year. RETAILTECH JAPAN, hosted by the Nikkei, is an exposition of distributional information systems, where 200 or more exhibitors attracted some 130,000 attendees, targeting distributers, retailers, and food service providers.
GS1 Japan, with cooperation from the Ryutsu (Distribution) Business Message Standards (BMS) council, set up a booth in this exposition and worked actively to promote the Ryutsu BMS and GS1 standards. During the exposition period GS1 hosted a prepared seminar to report the latest trends of distribution systems using GS1 standards, and gathered more than 200 participants this time.

3.10 GS1 Asia Pacific Regional Forum 2017 in Tokyo

The GS1 Asia Pacific Regional Forum is an annual conference held in take turns, gathering all GS1 Member Organizations (MOs) from the Asia Pacific region. Its main objective is discussing issues regarding ongoing regional projects and local issues, and exchanging information. In 2017, GS1 Japan hosted a three-day forum, which was held at Hotel InterContinental Tokyo Bay from October 24th to 26th. Over 70 GS1 colleagues from 18 MOs and GS1 Global Office (GO) participated in this event.
Five companies (most are GS1 Japan Partners) sponsored the event.

Fig. 3.10-1 GS1 Asia Pacific Regional Forum 2017 in Tokyo

At the Pre CEO Forum, an election took place for two regional representative MOs of the GS1 Management Board for the next term and GS1 Australia and Japan were elected.
The main topics of the forum were:

1. Key Initiative Update from AP MOs (Fig.3.10-3)
2. GS1's contribution to the effort to improve efficiency of international logistics led by the Asia-Pacific Economic Cooperation (APEC)
3. Sharing and discussion of GS1's focused challenges

During the forum, training sessions were conducted in parallel: GS1 Global Product Data Solutions Training, GS1 Standards Development Certification Programme, GS1 Standards in Hospitals, and Marketing Workshop.

Fig. 3.10-2 Program

October 24th	October 25th	October 26th	October 27th	
Free	CEO Forum	CEO Forum/Training	Optional Sightseeing Tour Kamakura	Optional Technology Visit Haneda Chronogate
Registration	Coffee Break	Coffee Break		
	CEO Forum/Training	CEO Forum/Training		
Lunch	Lunch	Lunch		
Pre CEO Forum/Training	CEO Forum/Training	CEO Forum/Training		Free
Coffee Break	Coffee Break	Coffee Break		
Pre CEO Forum/Training	CEO Forum/Training	CEO Forum		
Networking Dinner	Welcome Dinner	Farewell Dinner		

Fig. 3.10-3 MO Updates

GS1 Around Healthcare	
GS1 Singapore	Overview of GS1 Healthcare Sector Engagement
GS1 Malaysia	National Healthcare Track and Trace Initiative
GS1 Korea	UDI, Recent Progress and Future Challenges
GS1 Indonesia	Indonesian FDA's Plan to Use 2D Barcode
Traceability/Recall	
GS1 New Zealand	"Pulling It Back" - Product Recall Service in NZ
GS1 Japan	Going Upstream of Food Supply Chain
Consumer Experience	
GS1 Hong Kong, China	Visibility and Authenticity Build Consumer Trust
GS1 India	Enabling Regulatory Compliance through Smart Consumer App
GS1 Chinese Taipei	Taiwan User Case on Omni-Channel Retailing
Key Initiatives Update	
GS1 Australia	Strategies for Growing Membership
GS1 China	Traceability, Data Service, Logistics, Technical Industry, Healthcare
GS1 Thailand	Healthcare, SmartBar, Collaboration with Other Organizations
GS1 Vietnam	Statistics and Key Activities

Takuya Shiraishi, then Senior Vice President of Lawson, Inc., and Jun Murai, Professor of Faculty of Environment and Information Studies at Keio University Auto-ID Lab. Japan were invited as guest speakers. Below are summaries of their presentations.

Using RFID Technology for Smart Stores

Takuya Shiraishi

Up to now, Lawson, Inc., which is operating 13,000 convenience stores across Japan and 1,500 stores overseas, has adopted to past social shifts by flexibly changing its products and services. But the current shifts in Japan—labor shortages due to the declining birthrate and personnel cost increase—require a new approach: improving productivity through innovation. Given the above situation, Lawson established the Open Innovation Center in May 2017, where it has made investments in new technologies, working with various technology partners to develop new technologies and services.

In April 2017, the Ministry of Economy, Trade and Industry (METI) and five major convenience store chains in Japan (Seven-Eleven Japan Co., Ltd., FamilyMart Co., Ltd., Lawson, Inc., Ministop Co., Ltd., and JR East Retail Net Co., Ltd.) jointly declared introduction of RFID tags for all products for item-level tracking by 2025. The number of those products is estimated to be 100 billion per year.

Lawson conducted a series of studies and research into RFID in 2016, and ran a pilot in a convenience store in February 2017. Its main objectives are to shorten checkout time and improve efficiency of employee operations. When customers place the basket into the robotic checkout system, the bottom panel of the

basket opens automatically, placing all items into a plastic bag, while the system simultaneously scans the items' RFID tags to show the total amount on the display.
In the initial phase of the pilot, there were concerns that the system could not read the RFID tags of frozen or watery food. But RFID tags were able to be attached to any product, and the reading accuracy obtained a high score of 98%. This experiment attracted so much attention, being covered by almost all mass media outlets in Japan and introduced to overseas countries by some foreign media outlets.
The RFID Open Platform initiative is the pillar of Lawson's strategy to improve efficiency and productivity of the entire supply chain by utilizing technology. This initiative aims to share the transaction data of trillions of items in the cloud and utilize them on the entire supply chain.
To realize the RFID Open Platform initiative, usage of GS1 Identification Keys as well as standard for information-sharing is essential. Accordingly, adopting EPC Information Services (EPCIS) is under consideration.

Internet of Things: Next Generation

Jun Murai

Internet of Things (IoT) is a concept that all devices become connectable to the internet, creating huge amounts of data, and allowing people to access the data.
In recent years, the number of internet users is dramatically rising all over the world. While it was only 361 million, or 6% of the world population, in 2000, it has now reached 3.8 billion, or 51.7% of the population. Meanwhile, the United Nations set a target in "*17 Sustainable Development Goals*" to "significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020." (*1)
The first infrastructure required to realize an environment in which everyone in the world can access the internet is through new devices like smartphones. Such innovative devices have become the driving force of IoT.
Moreover, service platforms are also essential. Establishing a service platform enables users to easily access the data on the internet, and what is more, anyone can provide those services effortlessly.
In the IoT world, not only do objects move, but data does as well. Movement of objects may have borders between countries, but data movement has none. So interactive and limitless accessibility to any data is crucial. In other words, data standardization is essential for its utilization. In this regard, GS1 plays an important role.
As one of the promising IoT technologies, 3D printers have attracted much attention. This technology has been rapidly developed in recent years and various research institutions are conducting experiments and surveys. It is thought that society and daily lives will be largely altered once 3D printers become more accessible as daily tools. With this shift, handling of intellectual property rights, the Product Liability Act, and personal information will need to be discussed in detail in the future.
As the internet becomes more popular, it will become more important to consider how to use IoT for the public interest.

Handing Over to the Next Host of GS1 Macau, China

The GS1 Asia Pacific Regional Forum 2018 will be held in Macau in September 2018. In the Closing Session, a plate engraved with successive host MOs was handed over from Hiromu Ueno, then CEO of GS1 Japan to Jack Chang, Executive Director of GS1 Macau, China.

Fig. 3.10-4 Handing Over to the Next Host of GS1 Macau, China

*1 http://www.un.org/sustainabledevelopment/infrastructure-industrialization/

4. Corporate Information

4.1 Overview

GS1 Japan was founded in 1972 mainly through the efforts of the then Ministry of International Trade and Industry (present Ministry of Economy, Trade and Industry or METI) as the Distribution System Research Institute (DSRI), a non-profit organization for promoting the introduction of distribution systems and rationalizing and increasing the efficiency of supply chains. At first, the institute conducted studies on the standardization of national product codes for apparel and grocery. Following the move towards standardized symbols as well as product codes in the U.S. and Europe, the institute started working to build a system for standardized product codes and symbols in Japan. Then in 1978, it applied for participation in EAN Association and was admitted as the first member except European countries.

In the second half of the 1970s, GS1 Japan paved a way to adopt EAN system in Japan, starting with the introduction of EAN symbols into the Japanese Industrial Standards (JIS). Source marking was tested with cooperation from Kikkoman Corporation (a soy sauce manufacturer), Coca-Cola Japan, Kai Corporation (a cutlery manufacturer), while retailers began to conduct storefront experiments with POS system.

In the 1980s, Jusco Co., Ltd. (present AEON Co., Ltd.), Co-op supermarket stores and other retailers conducted pilots on the POS system. GS1 Japan held many seminars on EAN system and POS system throughout Japan and encouraged stakeholders to adopt source marking.

The important milestone for the widespread use of source marking was the fact that, in 1982, Seven-Eleven Japan, a convenience store chain, adopted POS system at all of its stores (which totaled 1,650 at that time, but are about 12,800 at present). Another factor contributing to the diffusion of POS system was the introduction of consumption tax in 1989. GS1 Japan created study groups for several industries in the 1980s and worked together with these industries to study how to improve their business process using computer systems. These industries included processed foods, sporting goods, consumer electronics, and books and magazines. A study group of wholesalers was also established by organizing representatives from different industries. These study groups soon came to cooperate in the adoption of EAN standards.

In addition, it is worth noting that GS1 Japan started the service for collecting and providing POS data and began to operate the Japan Item Code File Service (JICFS), the product catalogue, as early as in the mid-1980s.

During the 1990s, GS1 Japan studied product codes, EDI messages and other subjects in cooperation with the apparel industry under METI-funded study of quick response (QR) system. Retailers used to assign their proprietary code to apparel products. Our joint study with the apparel industry led to the diffusion of EAN source marking on apparel products. It was also a landmark event when the GS1-128 was introduced for the labeling of crates containing various products delivered to department stores. The Japanese EDI messages, JEDICOS, based on the EANCOM was also completed around that time.

In the 2000s a new business model was established in Japan in which convenience stores acted as agencies for receiving public utility payments from customers. As the tool for realizing this service, the GS1-128 was adopted on the bills for the public utility charges. And the meat industry also decided to adopt the GS1- 128 for its standard labels for traceability. The second half of 2000s was characterized by the fact that the GTIN began to be used for the online music service, an intangible product, and that Internet and mail order companies started to adopt the GTIN for their product management purposes. During the 2003-2009 period, GS1 Japan founded EPCglobal Japan and worked to solve the problems of introducing RFIDs tags into various industries (e.g., apparel, footwear, books, consumer electronics, and international distribution) by supporting METI's RFID pilot programs and thus established the basis for the diffusion of RFID.

In 2009, GS1 Healthcare Japan was established as a voluntary group for promoting GS1 Standards in healthcare sector. This move can be regarded as the outcome of our pioneering activities after the late 1990s, including our publication of guidelines for the use of the GS1 System for medical devices in cooperation with the healthcare industry. In the area of EDI, GS1 Japan created an XMLformat EDI standard (Ryutsu BMS) for supporting domestic business practices and has worked to spread the standard together with 49 trade organizations. There have been new developments in several recent years. As public interest in food safety has increased, GS1 Japan started a joint study with Japanese supermarkets and supply

chain stakeholders on the use of GS1 DataBar including pilot testing of the symbol with discounted price or sell-by-hour information at retail stores.
In 2015, GS1 Japan launched the program “GS1 Japan Partners”, aiming to share information and best practices among solution providers.

In 2017, GS1 Japan hosted GS1 Asia Pacific Regional Forum in Tokyo where more than 80 people attended from GS1 GO and 18 AP MOs.

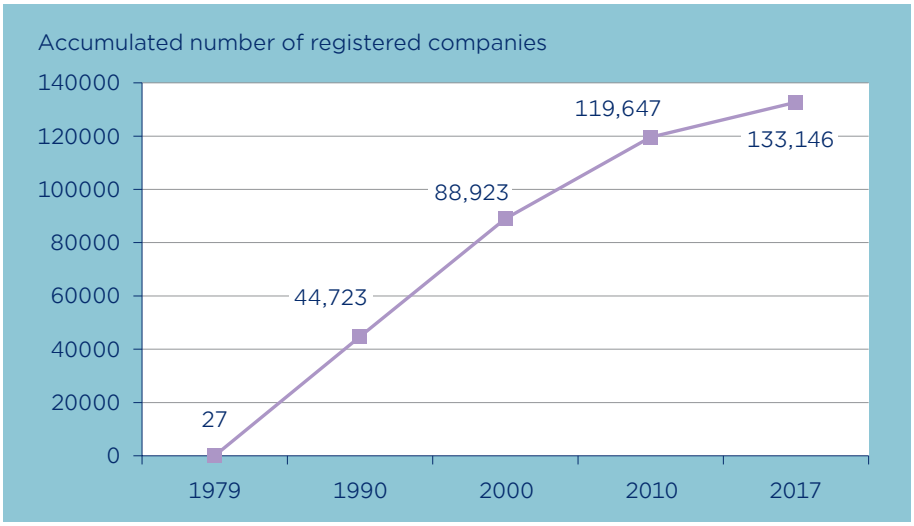
4.2 GS1 JAPAN

We joined GS1 in 1978 and obtained the GS1 prefix “490 - 499”. We subsequently applied for an additional prefix in 1992, obtaining the prefix “450 - 459”.
Initially, GS1 Japan was allocating 7-digit GS1 Company Prefixes, but since January 2001, we have started to allocate 9-digit GS1 Company Prefixes, given the rise in the number of registered companies and a recommendation from GS1.
Currently, in principle, GS1 Japan allocates 9-digit GS1 Company Prefixes to new applicants. However, for companies with 50,000 or more product items, GS1 Japan allocates 7-digit GS1 Company Prefixes.
When a company continues to use the GS1 Company Prefix, it needs to renew the registration every 3 years.
In the fiscal 2017, we had 11,399 new registrations.
As of the end of March 2018, the number of registrations for GS1 Company Prefixes reached 133,146.

Recently, sole proprietorships are leading the number of registrations, accounting for around 37% of the new registrations in the first half of fiscal 2017. That number compares to about 21% seven years ago, recording a significant increase. Another trend to highlight is the increase in applications to sell products on online shopping sites.

The top product categories for newly registered companies during the first half of fiscal 2017 were: 1) processed food (18%); 2) clothing (12%); 3) daily goods and sanitary health products (8%); 4) cosmetics (6%); and 5) household products (5%). Compared to past figures, it is notable that “clothing”, which is traded actively through online shopping sites, marked a large increase. It was also notable that many companies listed online-shopping business operators, such as Amazon, as their main clients.
The other trend to highlight is the increase in registrations by producers of agricultural products, marine processed foods, and other local specialties aiming to expand their sales channels.
By source-marking their products, producers can distribute products through new sales channels such as Roadside Stations and outlets of agricultural products.
GS1 Japan offers seminars on a regular basis to promote the correct understanding of the GS1 standard, in addition to onsite seminars held across the nation when there is a request. Recently, the number of onsite seminars requested by the producers of agricultural products, marine processed food, and local specialties have increased, supporting the trend seen in the registration data.
We expect the registration for GS1 Company Prefixes will continue to increase, given the expansion of online sales channels as well as the spread of source-marking in areas such as clothing and professional goods, where the source-marking ratio used to be low.

Fig. 4.2-1 GS1 Company Prefix allocation



4.3 Chronology

1972	DSRI (Distribution Systems Research Institute) established.
1973	Supply chain information network models developed.
	“Distribution and Systems Review” launched
1974	Uniform trade codes studied for each business category.
1975	Capacity building courses on Distribution systems started for both managers and system engineers
1977	Study Group for Supply Chain Information Systems established.
	GS1 Japan established (Previous name: DCC Japan).
	Allocation of common supplier codes started.
1978	Joined EAN International.
	EAN/UPC Symbol became Japanese Industry Standard
	Allocation of GS1 Company Prefix started.
1979	First POS pilot conducted at a supermarket in Tokyo.
1980	Japanese communication protocol for retail industry established.
	POS pilots conducted at AEON, Nada Coop.
1981	POS pilot conducted at a voluntary chain (SME).
1982	“DCC Japan Newsletter” published.
	7-11 Japan (convenience store) introduced POS.
1983	Low-interest financing for POS introduction provided to small and medium retailers by government.
1984	Study Group for Information System in Food, Beverage, and Alcohol Industry established.
	Study Group for ICT-Oriented Wholesale Industry established.
1985	Ryutsu POS Database Service (RDS) Project started.
	JICFS (Jan Item Code File Service) Project started.
1986	Ito-Yokado (GMS) introduced POS.
	Sporting Goods Information System Study Group established.
1987	Barcoding in magazine Industry started.
	ITF symbol become Japan Industrial Standard.
	Utility bills collection service system using multiple EAN-13 symbols established.
1988	Standard EOS system using GTIN-13 established.
	EAN International General Assembly held in Tokyo.
	UPC Company Prefix application service started.
1989	Consumption tax introduced.
	Research and pilots of POS for small retailers located in shopping street
1990	Barcoding in Book Industry.
1991	Multi-functional cards for regional shopping streets developed.
	Daiei (GMS) adopts EAN codes for all products.
1993	Heiwado (supermarket in Western Japan) adopts ITF.

1994	SCM (Shipping Carton Marking) /ASN (Advance Shipping Notice) with GS1-128 used for SCM label system guideline published.
1995	In addition to GS1 Prefix “49”, allocation of GS1 Company Prefix starting with “45” started.
1996	Study for computerization of trade for perishables started.
1996	Open Business Network (OBN) system developed.
	Code-128 symbol become Japanese Industrial Standard.
1997	CRP (continuous replenishment program) tested at Heiwado.
	Japanese version of EANCOM established.
1999	Study and Pilot for Supply Chain Promotion for Efficient and Effective Distribution System Allocation of GLN started
2001	9-digit GS1 Company Prefix introduced.
2002	EAN International’s Asia Pacific Regional Meeting held in Tokyo.
2003	GEPIR operation started.
	EPCglobal subscription started.
	Japanese Industry Standard for GS1 Application Identifier established.
2004	RFID tags for ladies’ shoes used at Mitsukoshi Department Store.
2005	Guidelines for Barcoding Pharmaceuticals with GS1 standard published.
	Promotion of GTIN started
2006	GTIN adopted for online sales of music products.
	EPCglobal Board of Governors Meeting held in Tokyo.
2007	Ryutsu BMS (Japanese XML-EDI Message Standards) published.
	GS1 Mobile Conference held in Tokyo
	GS1 DataBar Study Group launched.
2008	GS1 Healthcare conference held in Tokyo.
	Internet shopping company utilizes JICFS/IFDB.
2009	Supply Chain Standard Management & Promotion Council established.
	GS1 Healthcare Japan established.
2010	Pilot for utilization of GS1 Data Bar in supermarkets
	Mobile Day Seminar held in Tokyo
2011	Mobile Day event held in Tokyo
2012	GS1 Advisory Council Meeting held in Tokyo
2013	GS1 Japan celebrates GS1 40th anniversary
	GS1 B2C mobile and omni channel Seminar held in Tokyo
2014	GS1 Healthcare Japan UDI and medicinal drug traceability Seminar held in Tokyo
2015	GS1 Japan Partners was established
2017	Published Source Marking Guideline for Raw Materials
	Hosted GS1 Asia Pacific Regional Forum in Tokyo

5. Reference

5.1 Statistics on Japanese Retail Industry

Table 5.1-1 Number of Stores, Number of Employees, and Annual Sales by Type of Stores (As of 2014)

	Number of Stores	Composition Ratio (%)	Number of Employees	Composition Ratio (%)	Sales (¥Million)	Composition Ratio (%)
Department Stores	195	0.0	66,683	1.1	4,922,646	4.0
General Supermarkets	1,413	0.2	265,956	4.6	6,013,777	4.9
Specialty Supermarkets (Apparel)	8,594	1.1	130,006	2.2	2,189,240	1.8
Specialty Supermarkets (Grocery)	14,768	1.9	748,815	12.9	15,375,413	12.6
Specialty supermarkets (Home furnishing)	8,712	1.1	213,088	3.7	4,803,833	3.9
Convenience Stores	35,096	4.5	537,618	9.3	6,480,475	5.3
Drugstores	14,554	1.9	187,442	3.2	4,300,305	3.5
Other Supermarkets	45,154	5.8	331,445	5.7	4,537,507	3.7
Specialty Stores (Apparel)	95,754	12.4	364,941	6.3	5,728,829	4.7
Specialty Stores (Grocery)	151,950	19.6	677,392	11.7	7,390,328	6.0
Specialty Stores (Home furnishing)	373,227	48.1	2,020,596	34.8	49,338,306	40.4
Large Specialty Stores (Electronics)	2,382	0.3	81,489	1.4	4,458,503	3.6
Other Retail Stores	1,049	0.1	5,088	0.1	203,237	0.2
Non-Store Retails	22,348	2.9	180,366	3.1	6,434,326	5.3
Total (Scope of Calculation by Type of Stores)	775,196	100	5,810,925	100	122,176,725	100

(*1) “Employees” refers to “workers/temporary employees that are loaned/dispatched to other locations” taken out of “temporary employees” and “workers that are loaned/dispatched from other locations” added to “workers”. “Workers” are the total of “private business owners”, “unpaid family workers”, “paid officers”, and “full-time employees” and do not include temporary employees.

The source : Census of Commerce in 2014 Report by Type of Store (Retail Trade)
Ministry of Economy, Trade and Industry of Japan

Table 5.1-2 Top 20 Wholesale Companies in Japan (As of 2016)

2016	2015	Company Name	Location of Head Office	Annual sales (¥Million)	Annual Growth (%)	Business Line
1	1	Medipal Holdings Corporation	Tokyo	3,063,900	1.2	Drugs
2	2	Alfresa Holdings	Tokyo	2,551,801	-1.0	Drugs
3	3	Mitsubishi Shokuhin	Tokyo	2,411,474	1.2	Grocery
4	4	Suzuken	Aichi	2,126,993	-4.5	Drugs
5	5	Nippon Access	Tokyo	2,015,494	6.1	Grocery
6	6	Kokubu	Tokyo	1,817,876	11.0	Grocery
7	7	Toho Holdings	Tokyo	1,231,046	-5.9	Drugs
8	8	Kato Sangyo	Hyogo	953,153	2.9	Grocery
9	9	Mitsui Foods	Tokyo	799,000	0.8	Grocery
10	10	Arata	Tokyo	704,610	4.1	Sundry Goods/Medical Supplies
11	-	TOMOSHIA HOLDINGS	Tokyo	683,892	-	Grocery
12	11	Itochu Shokuhin	Osaka	631,002	-3.4	Grocery
13	12	Nihon Shuppan Hanbai	Tokyo	624,422	-2.4	Books/Audio/Video/Music Instruments
14	13	Vital KSK Holdings	Tokyo	581,079	-6.4	Drugs
15	14	Nihon Shurui Hanbai	Tokyo	551,431	1.5	Grocery
16	15	Tohan	Tokyo	475,907	-2.6	Books/Audio/Video/Music Instruments
17	16	Forest Holdings	Oita	450,055	-2.8	Drugs
18	17	YAMAE HISANO	Fukuoka	379,573	2.9	Grocery
19	18	Starzen	Tokyo	313,943	3.5	Grocery
20	19	CHORI	Osaka	270,908	-7.1	Textile

The source : The Nikkei Marketing Journal

Table 5.1-3 Top 20 Retail Companies in Japan (As of 2016)

2016	2015	Company Name	Type of Business	Annual Sales (¥Million)	Growth (%)
1	1	Aeon	Holding Co.	8,210,145	0.4
2	2	Seven & I Holdings	Holding Co.	5,835,689	-3.5
-		Aeon Retail	Supermarket	2,185,300	0.4
3	3	Fast Retailing	Holding Co.	1,786,473	6.2
4	4	Yamada Denki	Specialty Store	1,563,056	-3.1
-		Ito-Yokado	Supermarket	1,255,017	-2.7
5	5	Isetan Mitsukoshi Holdings	Holding Co.	1,253,457	-2.6
6	7	Amazon Japan*	Online Retailer	1,174,713	17.5
7	6	J. Front Retailing	Holding Co.	1,108,512	-4.7
8	8	Takashimaya	Department Store	923,601	-0.6
9	9	H2O Retailing	Holding Co.	901,221	-1.6
10	27	FamilyMart UNY Holdings	Holding Co.	843,815	98.8
-		Seven-Eleven Japan	Convenience Store	833,743	5.1
-		UNIQLO	Specialty Store	799,817	2.5
11	10	Bic Camera	Specialty Store	779,081	-2.0
-		Sogo・Seibu	Department Store	760,692	-5.3
12	12	Don Quijote Holdings	Holding Co.	759,592	11.1
-		UNY	Supermarket	742,032	-2.1
13	14	Izumi	Supermarket	702,120	5.0
-		United Super Markets Holdings	Holding Co.	684,806	3.2
14	11	EDION	Specialty Store	674,426	-2.6
-		Mitsukoshi Isetan	Department Store	660,147	-2.8
15	15	K's Holdings	Specialty Store	658,150	2.2
16	13	Yodobashi Camera	Specialty Store	658,042	-3.2
17	-	Life Corporation	Supermarket	652,974	-
-		Daimaru Matsuzakaya Department Stores	Department Store	646,990	-4.5
18	16	Lawson	Convenience Store	631,288	8.2
-		WELCIA Holdings	Holding Co.	623,163	17.9
19	17	SHIMAMURA	Specialty Store	566,510	3.6
-		WELCIA YAKKYOKU	Specialty Store	546,111	26.3
20	18	Matsumotokiyoshi Holdings	Specialty Store	535,133	-0.2

A company with a hyphen (-) in the rank column is a consolidated subsidiary whose parent company is included in the top 500 list.
(*) The annual sales of Amazon Japan is calculated at the annual average exchange rate.

The source : The Nikkei Marketing Journal

Table 5.1-4 Top 10 Convenience Store Chains in Japan (As of 2016)

2016	2015	Name	Location of Head Office	Group	Annual Sales (¥Million)	Number of Stores
1	1	Seven-Eleven	Tokyo	Seven & I Holdings	4,515,605	19,422
2	3	Family Mart	Tokyo	FamilyMart UNY Holdings	3,009,363	17,001
3	2	Lawson	Tokyo	Mitsubishi Corporation	2,455,076	13,111
4	4	Ministop	Chiba	Aeon	340,492	2,263
5	5	Daily Yamazaki	Tokyo	Independent	185,699	1,533
6	6	Seicomart	Hokkaido	Independent	182,755	1,183
7	7	NewDays	Tokyo	East Japan Railway Company	101,474	494
8	8	Three F	Kanagawa	Independent	67,995	438
9	9	Poplar	Hiroshima	Independent	56,927	472
10	10	Save On	Gunma	Beisia	52,601	501

The source : The Nikkei Marketing Journal

Table 5.1-5 Sales by Type of Merchandise in Department Stores
(As of 2017)

Type of Merchandise	Total sales (¥Million)	%
Apparel	1,839,798	30.9%
Accessories	775,792	13.0%
Household Goods	254,555	4.3%
Grocery	1,656,006	27.8%
Restaurant	158,572	2.7%
Sundry Goods	1,080,131	18.1%
Service	61,631	1.0%
Others	126,768	2.1%
(Shopping Gift Cards) *	-154,510	-
Total Sales	5,953,256	100.0%

(*The sales of shopping gift cards are not included in the total sales.)
The source : Japan Department Stores Association

Table 5.1-6 Sales by Type of Merchandise in Chain Stores
(As of 2017)

Type of Merchandise	Total sales (¥Million)	%
Grocery	8,459,949	65.5%
Apparel	1,072,097	8.3%
Sundry Goods	1,019,307	7.9%
Drugs & Cosmetics	369,353	2.9%
Furniture & Home Furnishing	666,983	5.2%
Home Electrical Apparatus	122,508	0.9%
Other living goods	395,568	3.1%
Service	33,850	0.3%
Others	777,912	6.0%
Total Sales	12,917,532	100.0%

The source : Japan Chain Stores Association
(56 member companies and 9,904 stores)

Table 5.1-7 The Growth of E-Commerce Market in Japan (As of 2016)

Type of Merchandise		2015		2016		
		Scale (¥Billion)	EC ratio	Scale (¥Billion)	Growth (%)	EC ratio
Retail	Grocery	13,162	2.03%	14,503	10.2%	2.25%
	Electrical Products	13,103	28.34%	14,278	9.0%	29.93%
	Books, Videos, Music	9,544	21.79%	10,690	12.0%	24.50%
	Drugs & Cosmetics	4,699	4.48%	5,268	12.1%	5.02%
	Furniture, Household Goods	12,120	16.74%	13,500	11.4%	18.66%
	Apparel & Accessories	13,839	9.04%	15,297	10.5%	10.93%
	Automobile, Automobile Parts	1,874	2.51%	2,041	8.9%	2.77%
	Office Supplies, Stationeries	1,707	28.19%	1,894	10.9%	33.61%
	Other	2,348	0.63%	2,572	6.3%	0.75%
	Total (Retail)	**72,398**	**4.75%**	**80,043**	**10.6%**	**5.43%**
Service	Tourism	28,850	-	30,393	5.4%	-
	Restaurants	2,379	-	3,292	38.4%	-
	Tickets	3,750	-	4,468	19.1%	-
	Financial Services	6,192	-	6,113	-1.2%	-
	Beauty & Barbour Services	2,420	-	3,261	34.7%	-
	Other (Healthcare, Insurance, Beauty & Barbour, Residence, Education)	5,423	-	6,005	10.7%	-
	Total (Service)	**49,014**	**-**	**53,532**	**9.2%**	**-**
Digital	Electronic Publishing (E-Books, E-Magazines)	1,771	-	2,151	21.5%	-
	Music Distribution Service	471	-	529	12.4%	-
	Video Distribution Service	650	-	1,153	77.4%	-
	Online Games	12,647	-	13,090	3.5%	-
	Others	796	-	859	8.0%	-
	Total (Digital)	**16,334**	**-**	**17,782**	**8.9%**	**-**
Total		**137,746**	**-**	**151,358**	**9.9%**	**-**

The source : METI (Ministry of Economy, Trade and Industry) "Research on Infrastructure Development in Japan's Information-based Economy Society (E-Commerce Market Survey)"
The EC ratio in this survey refers to the ratio of the e-commerce market scale against the total amount of the overall commercial transactions.

Table 5.1-8 Top 20 E-Commerce (B2C) Players in Japan (As of 2016)

	Company Name (Website)	Annual Sales (¥Million)	Annual Growth (%)	EC ratio	Line of Goods	Account Closing Month
1	Amazon Japan (amazon.co.jp)	1,176,800	17.6	100%	General	Dec
2	Yodobashi Camera (yodobashi.com)	108,000	8.8	100%	Home Electrical Apparatus	Mar
3	Start Today (zozo.jp)	76,393	40.4	100%	Apparel	Mar
4	Senshukai (bellemaison.jp)	73,782	-4.8	69%	General	Dec
5	Rakuten Direct (soukai.com / kenko.com)*	60,000	-	100%	Daily Necessities	Dec
6	Dinos Cecile (dinos.co.jp) ※	58,260	-2.4	54%	General	Mar
7	Joshin Denki (joshinweb.jp)*	55,000	-	100%	Home Electrical Apparatus	Mar
8	Dell (dell.co.jp)*	50,000	-	100%	PC	Jan
9	Japanet Takata (japanet.co.jp)*	49,840	-	28%	Home Electrical Apparatus	Dec
10	Ito-Yokado (www.itoyokado.co.jp)	47,396	7.8	100%	Grocery	Feb
11	UNIQLO (uniqlo.com)	42,167	30.1	100%	Apparel	Aug
12	Kitamura (kitamura.co.jp)	40,478	-3.4	100%	Camera-Related Equipments	Mar
13	ASKUL (lohaco.jp)	39,016	18.8	100%	Daily Necessities	May
14	Jupiter Shop Channel (shopch.jp)*	38,730	-	25%	General	Mar
15	Nissen (nissen.co.jp)*	35,500	-	56%	General	Feb
16	Bic Camera (biccamera.com)	35,000	0.6	100%	Home Electrical Apparatus	Aug
17	MouseComputer (mouse-jp.co.jp)	32,615	13.1	100%	PC	Mar
18	QVC Japan (qvc.jp)*	29,430	-	30%	General	Dec
19	MOA (a-price.co.jp)	28,935	14.6	100%	Home Electrical Apparatus	Jun
20	Seven-Meal Services (omni7.jp)	26,678	15.5	100%	Grocery	Feb

The source : Koubunshuppan

(*: Estimate)
(※: Estimated from order ratio)

Table 5.1-9 Number of Vending Machines and Annual Sales in Japan (As of 2016)

Machine Type		Line of Goods	Number of Machines			Annual Sales (¥Million)		
			2015	2016	y/y	2015	2016	y/y
Vending Machines	Beverages	Soft Drinks	2,188,000	2,133,000	97.5%	1,822,604	1,740,528	95.5%
		Milk	161,000	148,000	91.9%	134,113	120,620	89.9%
		Coffee, Cocoa (Cup)	174,000	169,000	97.1%	143,202	137,904	96.3%
		Alcoholic Drinks	25,700	24,600	95.7%	33,410	30,750	92.0%
		Total (Beverages)	2,548,700	2,474,600	97.1%	2,133,329	2,029,802	95.1%
	Foods	Instant Noodle, Frozen Food, Ice Cream etc.	69,400	69,400	100.0%	54,132	54,132	100.0%
	Total (Beverages and Foods)		2,618,100	2,544,000	97.2%	2,187,461	2,083,934	95.3%
	Cigarette-Vending Machine		212,400	193,300	91.0%	255,603	209,356	81.9%
	Tickets	Boarding Ticket	15,200	14,800	97.4%	1,454,108	1,415,842	97.4%
		Food, Entrance and Other Tickets	32,600	35,400	108.6%	374,719	410,973	109.7%
		Total (Tickets)	47,800	50,200	105.0%	1,828,827	1,826,815	99.9%
	Sundry Goods	Prepaid and Other Cards	721,900	722,300	100.1%	413,600	417,968	101.1%
		Other (Newspapers, Sanitary Goods, Toys etc.)	139,000	138,800	99.9%	53,372	52,762	98.9%
		Total (Sundry Goods)	860,900	861,100	100.0%	466,972	470,730	100.8%
	Total (Vending Machines)		**3,739,200**	**3,648,600**	**97.6%**	**4,738,863**	**4,590,835**	**96.9%**
Service	Money Changer		59,500	61,000	102.5%	-	-	-
	Other (Checkout Machines, Rental Service, etc.)		-	1,231,800	-	-	-	-
	Total (Automated Service Machines)		**1,262,500**	**1,292,800**	**102.4%**	**142,320**	**145,200**	**102.0%**
Total			**5,001,700**	**4,941,400**	**98.8%**	**4,881,183**	**4,736,035**	**97.0%**

GS1 Japan (Reference : Japan Vending Machine Manufacturers Association)

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