GS1 Japan

The Global Language of Business

GS1 Japan Handbook

2016-2017

Message from the President

The global economy has continued to show instability due to the risk averse momentum leading to lower U.S. interest rates, and uncertainty is rising further with the results of Britain's referendum in June. Despite those circumstances, adoption of GS1 standards has grown steadily and more than 11,000 companies newly registered for a GS1 Company Prefix (GCP) in the previous fiscal year in Japan. I would like to take this opportunity to express my sincere gratitude to the GS1 community members for their cooperation and support.

The previous fiscal year was the first year in which GS1 Japan reorganized its structure according to industries and began operations under the new system. Thanks to the organizational change, we have been able to provide more tailored solutions and assistance to our member companies. In addition, we established the GS1 Japan Partners, the membership program consisting mainly of solution providers, and have been working to strengthen cooperation with solution providers who serve as important partners in developing and implementing concrete solutions. Furthermore, we began accepting online applications to register for a GS1 Company Prefix. By making application process of GCP easier and shortening the time to assign a GCP to each applicant, we have been able to improve accessibility for our users, while at the same time improving efficiency for administrative procedures within GS1 Japan.

As for initiatives for the industry in GS1's traditional areas of Retail & Consumer Packaged Goods (CPG), we have been proactively working to respond to the increase in the Internet and omni-channelling transactions, and to expand the use of Ryutu BMS (the new domestic industry standard EDI). In addition, we are working to improve efficiency in the food packaging industry as well as the supply chain between raw material manufacturers and processed food manufacturers, in which the use of the GS1 standards was lacking, and have published the guidelines to promote the use of the GS1 Standards in those areas. In healthcare, we are actively encouraging the use of the GS1 standards not only among medical device/drug manufacturers and their wholesalers, but also in hospitals to ensure medical safety and patient safety, improve distribution, and implement traceability. Furthermore, the Ministry of Health, Labour and Welfare's guideline on barcode labelling for medicine is to be partly amended this year to require barcode marking of expiration date and lot number on packaging, and this will lay the groundwork for ensuring greater traceability. In Transport & Logistics area, efforts have been made to promote the management of cage trolleys and foldable containers using EPC/RFID, while a verification experiment was conducted to improve the visibility of the cross-border supply chain for Japanese sake using GS1 Standards.

In moving forward, GS1 Japan will continue to intensify its contributions to promote the streamlining and improvement of operations using the GS1 system. Finally, I extend my best wishes for the continued success of GS1 member companies, GS1 MOs, and GS1 Global Office, and look forward to providing greater consumer satisfaction through implementation of GS1 Standards.

Hirokazu Hayashi
President
GS1 Japan

GS1 Japan Handbook 2016 - 2017
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1. Sector

1.1 Retail & CPG

1.1.1 Publication of a New EAN Symbol Marking Manual

GS1 Japan prepared and published the "JAN Symbol Marking Manual" in March 2015. (*1)

Fig. 1.1.1-1 JAN Symbol Marking Manual

Background on Writing the Manual

EAN symbols have been used for nearly 35 years in Japan, and have become one of the supply chain infrastructures.

Recently GS1 Japan has been notified of an increase in the number of EAN symbols that are difficult to read because of poor symbol printing quality. This is due to a surge in the number of products marked with EAN symbols and the diversification of the shapes and materials used for packaging.

Now, more than 10,000 companies (mostly SMEs) in Japan apply for a new GS1 Company Prefix every year. Most of the new users do not have knowledge on how to make a quality EAN symbol. Therefore, to maintain the efficiency of operations using barcodes, a growing number of users must be educated that they need to mark their products with appropriate symbol according to the standards.

Given this situation, GS1 Japan decided to prepare an EAN symbol marking manual to encourage the brand owners to understand the importance of an EAN symbol's quality, its basic features, cautionary notes on printing the symbols, and advice on how to locate the symbols appropriately. A working group of experts from equipment or services providers for printing, marking, scanning and verifying barcodes was established to prepare the manual, in order to ensure that the manual reflected real examples of the symbols in the market.

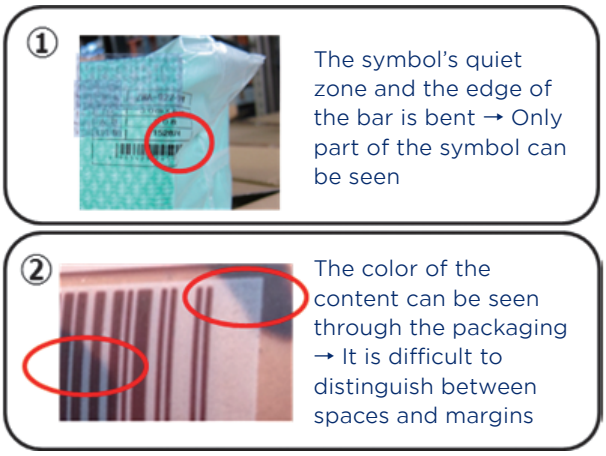
Outline of the Manual

1) Review of the Basics

The manual first reviewed the basics of the symbol and emphasized that the following points should be noted:

1. Importance of securing quiet zones (margins)
2. Clear bars and spaces
3. Securing a bar width and height that comply with the standards
4. Ensuring a sufficient contrast of the bars and spaces

Fig. 1.1.1-2 Examples of symbols that are difficult to read



Currently, many small EAN symbols are used in Japan. Also, many combinations of colors are used to represent the spaces and bars, for marketing and packaging design purposes, and some symbols are of a low quality. The manual explains how these symbols are often difficult to read and discourages their use.

2) Location on the Products: Importance of "How They Are Seen" by the reading device on the Final Product

Next, the manual emphasizes that it is important thatEAN symbol remains to be high quality when the product reaches its final physical form for distribution. The manual shows examples gathered from scanning device manufacturers that they found "difficult or unable to read", along with explanations of what the

*1 In Japan, the local name Japanese Article Number = JAN has been established to promote the widespread use of EAN codes and EAN symbols. Names such as the JAN code (GTIN – 13) and the JAN symbol are commonly known.

problem was for each case, and how to improve the quality of the symbols.

For example, in the case of ①, the EAN symbol is printed on the corner of a bag-shaped package, and the edge of the symbol becomes bent when the product is filled, making it impossible to recognize the bars/spaces and the margins. (Furthermore, in this case, the spaces are not colored, so they can be seen through.) The manual explains the symbol needs to be printed further to the left, and the importance of printing white spaces (and not simply making the spaces transparent).
In the case of ②, the EAN symbol is printed on a plastic container. There is no problem with reading the symbol when the container is empty, but when the container is filled with its content (in this case, ice cream), the color of the content can be seen through the plastic on the outside surface of the container. The color of the ice cream interferres both the bars and the spaces, making the width difficult to read and causing problems that make the scanning time-consuming or impossible. In this case also, the manual encourages the use of whiter margins.

3) The Importance of Reviewing the Quality and "Barcode Inspections"

Furthermore, regarding the quality of EAN symbols, the manual explains the importance of symbol print quality verification not only when the symbols are first printed on the packaging materials, but also when the product is packaged and reaches its final state for distribution. The manual has been well received by brand owners, retailers/wholesalers and device manufacturers/ printing companies. GS1 Japan plans to update the content of the manual as needed, and to offer further manuals that reflect the times.

1.1.2 Introducing Ryutsu BMS in Seiyu GK

1. Seiyu's Transition of its Communication Protocol

Seiyu GK, a subsidiary of the U.S.-based Walmart Stores, Inc., has 345 stores in Japan (*as of January 1, 2016). Seiyu has been working to update its EDI system since 2011, and has proceeded with a transition from the JCA Protocol (see 2.5) to the new domestic industry standard EDI, "Ryutsu Business Message Standards (Ryutsu BMS)". By the 2014 fiscal year, Seiyu had established connections with 593 vendors through Ryutsu BMS, and in June 2015 it abandoned its JCA Protocol environment, finishing the transition of its communication protocol.

2. Reasons for Introducing Ryutsu BMS

Ms Hiromi Hirabayashi, Executive Officer and SVP of Seiyu, said, "It was important for Seiyu to make the ordering process for our products more efficient. Considering the efficiency of the transaction process, as well as the limitations of the JCA Protocol's format due to the fixed length and communication methods, the transition to Ryutsu BMS was necessary."

3. Transition Process of the System

Seiyu held briefing sessions on the introduction of Ryutsu BMS from February 2010 onward at its headquarter and vendors' offices. The transition proceeded according to product categories, starting with non-fresh products such as processed foods and household goods. The company began by introducing the system as a pilot program to a few companies, including some small vendors. After that, the system was expanded to all vendors in the Kanto area, and was ultimately extended nationwide.

4. Handling of Fresh Products

Orders for fresh products used to be placed mostly by phone or by fax. Seiyu's core system sent faxes automatically, but this was not an efficient way of communicating because the information sharing in this system was cut off at that point. The adoption of a Web-EDI for ordering these products has significantly enhanced the company's operational efficiency.

5. Support for the Transitioning Vendors

To ensure a smooth transition to Ryutsu BMS, Seiyu did not set or enforce a timeframe on its vendors, but instead customized the schedule for each vendor individually, while considering their specific needs (such as their budget). Even if only one vendor sticks to the old system, Seiyu will also have to keep the old process in place. Therefore, in order to improve efficiency both in the operations and the processing, a full transition to the new system was necessary. In particular, when the Great East Japan earthquake occurred unexpectedly, it was expected that some vendors might face difficulties with the transition, but the process went more smoothly than had been anticipated.

6. Effects of Introducing Ryutsu BMS

For Seiyu, the biggest effect of introducing Ryutsu BMS was the speeding up in the ordering process. Under the JCA Protocol, data communications would take around two hours when the number of items was large; but the time was shortened considerably after the transition to Ryutsu BMS. Furthermore, since the vendors no longer need to customise the system for each retailer, maintenance became easier for them. This is because unlike the JCA Protocol, the format for Ryutsu BMS is standardized.

7. Outlook for the Future

Ms Hirabayashi, said "The transaction process has become more efficient with the introduction of Ryutsu

Fig. 1.1.2-1 Ms Hiromi Hirabayashi, Executive Officer and SVP of Seiyu

Fig. 1.1.2-2 Number of Seiyu Vendors that have Transitioned to Ryutsu BMS

Fiscal Year	Non-fresh	Fresh	Total
FY 2012	195	5	200
FY 2013	253	34	287
FY 2014	84	22	106
Total	**532**	**61**	**593**

Note: Number of companies excluding the Web-EDI fresh product vendors

Fig. 1.1.2-3 Seiyu's Data Exchange Communication Protocol

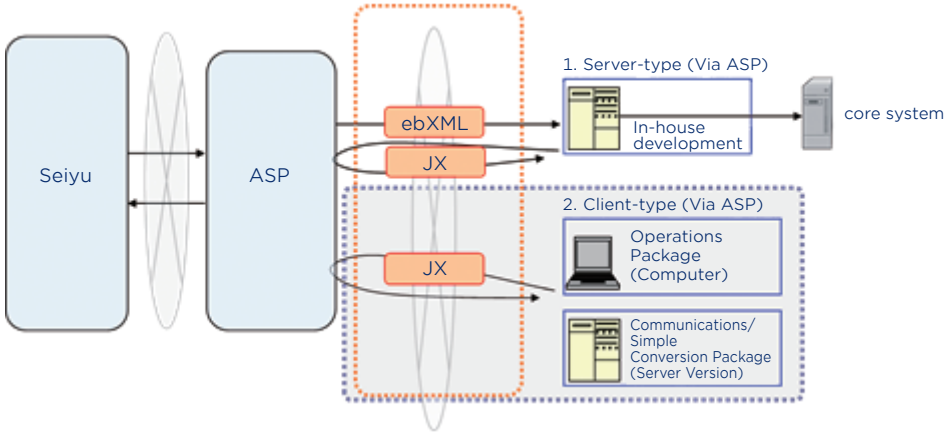


Fig. 1.1.2-4 Seiyu Niiza Store

BMS. Since the old system is still operating in some distribution centers, our goal going forward will be to consolidate the system that is used by Walmart globally," .

"We would also like to improve the quality of our distribution management. For example, we are thinking about raising the level of our cold chain management. To achieve this, we need to improve not only our information systems but also the related business processes."

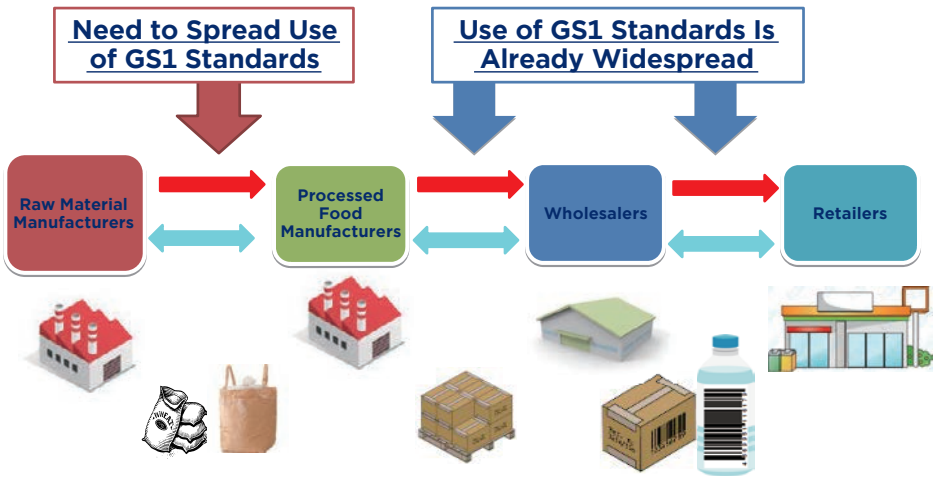
1.1.3 Publication of Source Marking Guideline for Raw Materials

1) Background on Writing the Guidelines

GS1 Standards are widely used in the supply chain between processed food manufacturers, wholesalers and retailers in Japan, and most traded products sold to consumers are marked EAN/UPC or/and ITF symbol encoded GTIN that is broadly used for receiving and shipping operations, merchandise control and traceability, etc. These GTINs are also used for standard EDI and product databases. On the other hand, the use of GS1 standards has not spread among raw material manufacturers and processed food manufacturers in the upstream of the supply chain, and many traded raw materials do not even have identification numbers nor barcodes. Therefore, visual observation or manual management is common.

However, in recent years, there have been cases in which some processed food manufacturers request raw material manufactures to mark barcode on the raw materials they receive for efficient receiving and shipping operations, inventory management and

Fig. 1.1.3-1 State of GS1 Standards Use in Japan



traceability development. Since GS1 Standards have not been widely used, and raw material manufacturers receive various requests from processed food manufacturers to mark barcodes in different 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 information items/formats) according to clients even for the same raw materials. There were concerns that if more processed food manufacturers demand different barcodes on the products shipped to them, the burden on raw material manufacturers dealing with the situation would grow, or the burden would be so great that the manufacturers would not be able to respond.

Given the circumstances, GS1 Japan summarized on the current situation and challenges of the upstream supply chain and developed this guideline with contributions from raw material manufacturers, processed food manufacturers, solution providers and experts.

2) Outline of the Guideline

The guideline establishes principles to identify raw materials traded among raw material manufacturers and processed food manufacturers, and describes how they should be marked in barcodes including technical details and points to be noted. The Guideline is developed to achieve the following:

a) Widespread identification of raw materials using GTIN and AIs
b) Increased source marking on raw materials by raw material manufacturers
c) Shift from manual management to management by a system (systematization) using barcodes

3) Benefits of the Guideline

The benefits of using the guideline are mainly as follows:

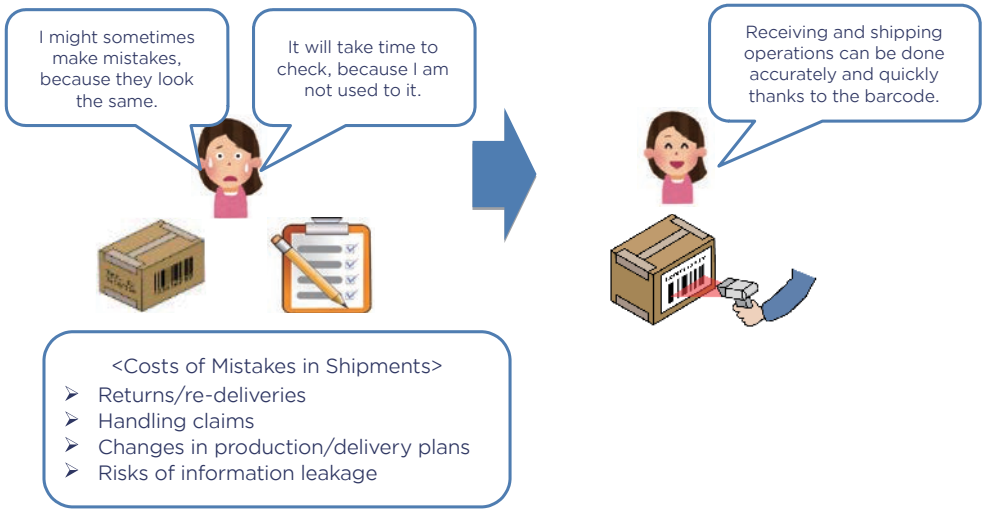
a) Increase in the rate at which raw material manufacturers marking barcodes (source marking) on raw materials

The guideline has described standard data format on barcode for raw materials. This makes it possible for

Fig. 1.1.3-2 standard data format (Application Identifiers) on barcodes

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

Fig. 1.1.3-3 Shift to Receiving and Shipping Operations Using Barcodes



raw material/material manufacturers to "eliminate the need to change codes or to show different items for different clients," enabling them to "deliver products under a standard format." If more raw materials are source marked as described in the guidelines, processed food manufacturers can leverage these standard barcodes for more efficient operations and/or keeping records.

b) Highly precise receiving and shipping operations

By standardizing data format (Application Identifiers) on barcodes for raw materials, the percentage of source marking by raw material manufacturers is expected to increase. By using barcodes in receiving and shipping operations, work done through visual observation can be transitioned to work using barcodes.

A barcode enables information to be scanned quickly and accurately by a machine and processed by a computer, and is expected to have the following effects:

- Prevent mistakes in receiving and shipping, due to mistakes in checking through visual observation or misunderstandings
- Eliminate inconsistencies in working hours/quality depending on workers
- Reduce the trouble of checking products and reduce the burden on workers
- Save time and reduce labor costs through systematization

c) Less work/improved accuracy for inputting data

To ensure traceability, there is a need to record/save information on when (arrival dates), from/to where (places), what (product names) and how many (numbers) raw materials were received/shipped. This recording/saving process can be done by hand, but by automatically retrieving data from barcodes into the system, the recording/saving can be done more quickly with more accuracy.

d) Speedy handling of inquiries

When there is an inquiry from a consumer or if an emergency occurs, there is a need to refer to the receiving and shipping records of the raw materials. The

Fig. 1.1.3-4 Shift to Data Input Using Barcodes

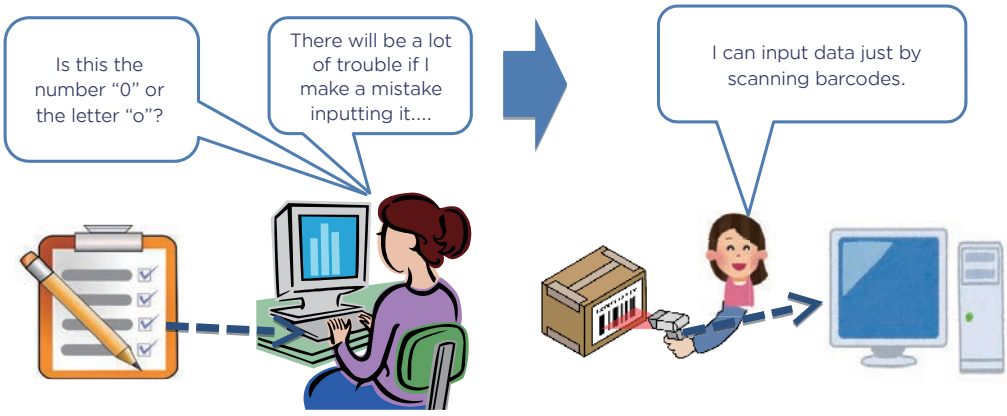


Fig. 1.1.3-5 Transferring Receiving and Shipping Records to a Database

records can be saved on paper, but when data from barcodes are transferred to a database to be saved and managed, it can be handled quickly while maintaining trust.

GS1 Japan, while working to spread the use of the guidelines, also plans to promote the use of standard EDI and product databases in cooperation with the industry, aiming to further streamline the supply chain among raw material manufacturers and processed food manufacturers.

1.2 Healthcare

1.2.1 Department of Anesthesiology at Nagoya City University Hospital:

Preventing the Erroneous Administration of Drug During Anesthesia using the GS1 DataBar

The Department of Anesthesiology at Nagoya City University Hospital has developed a system to prevent the erroneous administration of drug during anesthesia that: 1) reads the barcode (GS1 DataBar) marked on a drug (ampule or vial); 2) creates a syringe label that is categorized by color, according to the drug efficacy; and 3) uses two-dimensional barcodes printed on the syringe label for safety check and for automatic recording. The system was introduced in November 2014.

Outline of Nagoya City University Hospital

The hospital, established in 1931, is a medical institution located in the Nagoya metropolitan area. As of 2014, the hospital has 808 beds, an average of 1,785 outpatients per day, an average of 677 inpatients per day and performs 7,393 surgeries per year (with an average of about 20 per day).

Fig. 1.2.1-1 Nagoya City University Hospital

Drugs Used During Anesthesia and the Issues Involved

Anesthesia is indispensable when conducting surgeries. An anesthesiologist uses various drugs (such as vasopressors, hypotensive agents and muscle relaxants) to stabilize a patient's condition, while maintaining the depth of the anesthesia by adjusting the doses of anesthetic. Most of these drugs are adjusted to have an immediate effect, and can therefore be extremely dangerous in the case of an incorrect administration of the drug. The erroneous administration of drug during anesthesia is a major issue around the world, but decisive steps to prevent such errors have not yet been established.

According to a survey by the Japanese Society of Anesthesiologists, the erroneous administration of drug during anesthesia was reported about 0.04 percent (39.2 in 100,000 cases). The most common reason for an error was the mixing-up of drugs or of syringes loaded with drug. This is because the package designs

and names of the drugs are often similar, and the shapes and labels of the prepared syringes can look almost the same. The difficulty of reading handwritten labels is also an issue.

GS1 DataBar Marked on Drugs

In 2006, preventing the erroneous administration of drug, the Ministry of Health, Labour and Welfare issued "Implementation Guideline for Barcode Labeling of Prescription Drugs" (issued on September 15, 2006, and partially revised on June 29, 2012) to industry groups. Following this guideline, all injections since 2008 have been labeled with GS1 DataBar Limited or GS1 DataBar Stacked, in principle. Additionaly, when a lot number and an expirataion date are need to be marked into the barcode, in such cases as specific biological products, a composit symbol is used (see Fig1.2.1-2).

Fig. 1.2.1-2 GS1 DataBar Limited and its Composite Symbol

GS1 DataBar Limited

GS1 DataBar Limited Composite Symbol

The Composite Symbol shows (17) Expiration Date and (10) Lot Number in addition to (01) GTIN

What is the Syringe Label with Color Code?

To prevent the erroneous administration of drug, the ISO and anesthesia societies from around the world have standardized syringe labels that use common design including such as notaion of drugs and color codes to categorize the drug efficacy, and recommend their use. In March 2015, the Japanese Society of Anesthesiologists made a similar proposal.
The code is expected to reduce the number of incidents of the erroneous administration of medicine by making the labels easier to be recongnised. In the proposal from the Japanese Society of Anesthesiologists, the drugs are sorted into 13 categories depending on the drug efficacy, using nine background colors that appear with or without stripes. For example, muscle relaxants are given a red syringe label, while the relaxant reversal agents are given a red syringe label with white stripes (see Fig1.2.1-3).

Fig. 1.2.1-3 Color Code

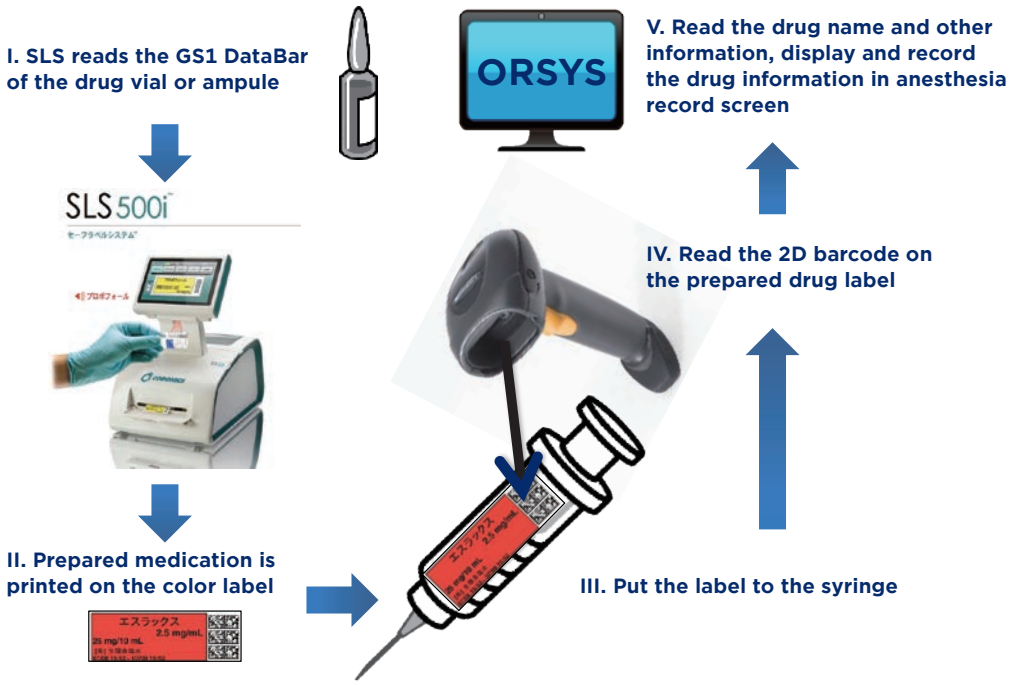
Drug classification	Color sample	Color name and pattern
Induction agents		Yellow
Benzopdiazepines		Orange
Benzopdiazepine antagonists		Orange with diagonal stripes
Muscle relaxants		Red
Relaxant reversal agents		Red with diagonal stripes
Opioids		Light blue
Opioid antagonists		Light blue with diagonal stripes
Vasopressors		Purple
Hypotensive agents		Purple with diagonal stripes
Local anaesthetics		Grey
Anticholinergic agents		Green
Anti-emetics		Salmon
Miscellaneous drugs		White

(Source) Japanese Society of Anesthesiologists "Measures to Prevent Perioperative Medication Errors and Erroneous Administration of Medicine –Proposal For Syringe Labels on Medicine"

For the Safer Use of Drugs

About 300 types of drugs are available in the operation rooms of Nagoya City University Hospital, and average 10 - 20 types of drugs are used in one operation..
The Department of Anesthesiology of the hospital has developed the NOS-SA (Nagoya City University Operation Room Safety-Smart Assistance) system, which combines a color-coded syringe label-printing device with a barcode reader called the Safe Label System (SLS500i™) (Codonics Limited KK.) and an automatic anesthesia recording system called ORSYS-TETRATM (Philips Electronics Japan, Ltd.) that records a patient's condition during the anesthesia, such as the blood pressure and heart rate as well as the drugs that arebeing used. The hospital began using this system in all of its operation rooms in November 2014.
The flow of preparing a syringe at a operation room is shown in Fig1.2.1-4. First, the GS1 DataBar on the drug to be used (the ampule or vial) is held up to the Safe Label System (SLS500i), where it is scanned and confirmed visually and audibly (Fig1.2.1-4 I). While a color coded syringe label is being printed, the drug is loaded into a syringe, and the printed syringe label ,on which Data Matrixs are also printed, is then placed onto the syringe (Fig1.2.1-4 II and III).
Before administration of the drug to a patient, the Data Matrix is sccaned with a barcode reader connected to ORSYS-TETRA. (Fig1.2.1-4 IV) At this time, the name of the drug is displayed on the screen with the syinge label color and information about the drug is presented as a

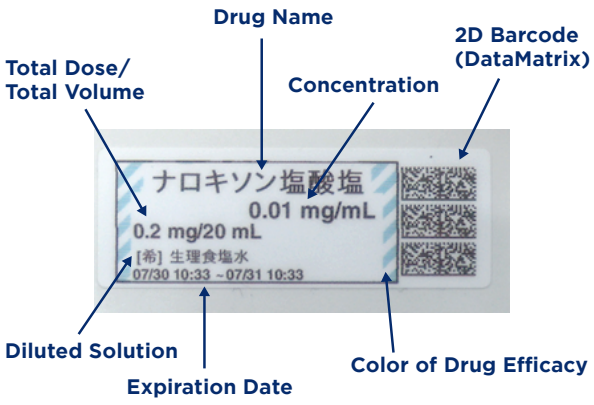
Fig. 1.2.1-4 Flow of NOS-SA



voice (Fig1.2.2-4 V). Because the information is presented audibly, more than two people can confirm the information and the drug can be administered more reliably. The information about the scanned drug is also transferred to an automatic anesthesia recording system.

An actual example of a printed syringe label is shown in Fig1.2.1-5. The syringe label is colored according to the color code of the drug efficacy, and Data Matrixs that contains information about the drug, are printed on the right.

Fig. 1.2.1-5 Example of Printed Syringe Label



Improvement in Safety and the Spread of the GS1 DataBar Usage

The NOS-SA works together with an automatic anesthesia recording system, which saves anesthetist from the trouble of manually entering the information.. On top of preventing the erroneous administration of drug, the big advantage of this system is that it reduces the burden on doctors and nurses.

The NOS-SA, which incorporate the Safe Label System, is one of the most advanced system for patient safety during surgeries. And the effectiveness of the system is assured by the fact that all drugs in Japan are marked with a GS1 Databar at the point of production.

Several hospitals have already used GS1 DataBar for confirmation of the drugs at the dispensaries. Furthermore, several leading hospitals, including Nagoya City University Hospital profiled here, are working on the next step in which GS1 DataBar could be also used at the time of administering drug to a patient. Going forward, more medical institutions are expected to work on the effective use of GS1 DataBar in order to improve patient safety.

1.2.2 GS1 DataMatrix Direct Marking Guideline for Surgical Steel Instruments

The Japan Association of Medical Devices Industries (JAMDI), a member of GS1 Healthcare Japan, released the “Technical Guideline on Direct Marking for Two-Dimensional Symbol on Steel Instruments (ver.1.2)” in July 2015. This guideline shows the recommended methods for manufacturers to mark their products, as

well as helps medical institutions to mark the instruments inside hospitals (in-hospital marking). The guideline was introduced at the GS1 Global Healthcare Conference in Budapest in October 2015.

Background

A lot of surgical steel instruments are arranged and used in an operation. Preparation of correct instruments and complete sterilization of them are essential to patient safety. Direct marking, which enables the identification of each instrument, is expected to contribute to improve reliability for these processes. Furthermore, direct marking enables traceability of each instrument and the traceability will enhance both patient safety and cost efficiency, by preventing instruments remaining in a patient body after an operation,and reduction of unnecessary instruments etc.

The necessity of direct marking for medical devices including steel instruments are described in the UDI (Unique Device Identification) guidance of IMDRF (International Medical Device Regulation Forum) and the U.S. FDA (Food and Drug Administration) UDI rule.

Fig. 1.2.2-1 GS1 DataMatrix directly marked on steel instruments

Outline of the Guideline

This guideline was written for the direct marking method on surgical steel instruments such as forceps, knives, scissors, complying with the rules of GS1 standards and in the consideration of long-term repetitive uses of marked instruments.

The guideline consists of the following sections.

1) Introduction
2) Conditions necessary for direct marking of two-dimensional symbols on steel instruments
3) Material suitable for marking and marking methods
4) Surface finishing and marking qualification for steel
5) Various marking and their adequacy
6) Marking quality
7) Attentions for marking technique
8) Manufacturing responsibility and user responsibility associated with marking
9) Companies that provides cooperation to prepare this guideline and their devices

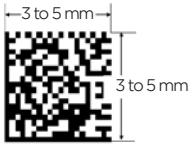
Key Points of the Guideline

There are 18 of direct marking methods described in ISO/IEC TR24720 (Information technology - Automatic identification and data capture techniques - Guidelines for direct part marking (DPM)). Of these methods, the laser method and the dot peen method were selected for the guideline, because of their durability.

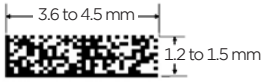
Some examples of the technical recommendation are as follows.

1) Marking a 3 to 5 mm square for GS1 DataMatrix of 18 x 18 cells. In this case, the minimum cell size becomes a 0.166 mm square.
2) Marking with n-by-n dots per one cell, because a precise marking technique has been established.
3) Marking with a depths of approximately 10 μm on a flat surface.
4) Rectangular symbol is suitable for thin rod-shaped instruments.
5) Marking a symbol on two surfaces, usually on the both sides of an instrument.

Fig. 1.2.2-2 Square and rectangular symbols of GS1 DataMatrix



a) When 3 mm or more square of marking area is assured.



b) When 3 mm square of marking area cannot be assured due to its shape

Utilization at Hospitals

Surgical steel instruments marked according to the guideline have already been used in several medical institutes. At present, it is usual that steel instruments are marked by each hospital (in-hospital marking). Therefore, the hospitals use their own GS1 Company Prefix to identify the instruments with GIAI (Global Individual Asset Identifier) for example at NTT Medical Center Tokyo and University of Fukui Hospital. They use the dot peen method.

Direct marking on steel instruments are expected to increase as a result of expansion of UDI regulation all over the world. This guideline will support manufacturers corresponding to these regulations.

The guideline in English is on JAMDI web site. http://www.jamdi.org/business/index_en.html

Fig. 1.2.2-3 Mr. Murata, the chairman of JAMDI DPM committee, introducing the guideline at GS1 Global Healthcare Conference in Budapest

1.3 T & L

1.3.1 The Co-op Tohoku Case of Introducing the EPC/RFID

CO-OP TOHOKU SUNNET Consumers' Co-operative Federation (Co-op Tohoku) is a group of organizations that is made up of nine co-operatives in six prefectures in the Tohoku region, with the Miyagi COOP at its center. The group is headquartered in Sendai, and the total membership of its affiliated co-operatives is about 1.65 million.

Co-op Tohoku began operating a new integrated distribution center for dry foods in September 2015. Four facilities that had previously been operating separately were consolidated for the purpose of streamlining the distribution functions of Co-op Tohoku as a whole, and new systems were put in place to resolve several issues. The new systems include the management of the transport equipment system using GRAI (Global Returnable Asset Identifier).

Measures to Counter Losses and Thefts of Transport Equipment

Previously, Co-op Tohoku's distribution bases were divided into four: a Food distribution center (for food), a Household goods distribution center (general goods, clothing), a Sunnet Joint purchase Distribution center (group purchases) and the Tohoku branch of the Japanese Consumers' Co-operative Union (Co-op PB). In addition, the distribution of goods for home delivery and for stores was operated separately. The new distribution center was constructed to increase the efficiency while lowering the costs. They decided to introduce an EPC/RFID system in order to reduce the loss of foldable containers, cage trolleys and roll cage, and improve the distribution management system.

The problem with the foldable containers and cage trolleys was that many were being lost or stolen. In the worst year to date, over 10 percent were either lost or stolen in a year. The shortages of the transport equipment lowered the operational efficiency in the distribution center, required repeated rental costs, and incurred additional delivery costs in order to share equipment between stores, specifically serious during busy periods.

They decided to manage each individual asset rather than just looking at the total amount of assets and installed EPC/RFID systems to identify the place where the equipment was lost.

450,000 Pieces of Transport Equipment Targeted

The introduction of the management system using the EPC/RFID aimed to:

1. Improve the operational efficiency – save on the time needed for managing the transport equipment
2. Improve the management accuracy – understand the exactly appropriate quantity and durability of the transport equipment with a better visibility of their use
3. Improve the value of the customer service – communicate the Co-op's latest efforts to its members

Compared with barcodes, RFID tags can be read even from a few meters away, when surface is dirty, or through a cover as long as the cover is not metal. Moreover, multiple RFID tags can be read at once. By taking advantage of these points, the total workload can be reduced.

The transport equipment involved in the system included: 400,000 foldable containers for group purchases, 37,000 foldable containers for stores, 3,000 cage trolleys for group purchases, and 7,400 roll cages for stores.

There were points to consider when choosing EPC/RFID tags for their transport equipment.

1) For budgetary and cost reasons, the company wanted to use the same types of tag for all transported equipment.
2) The foldable containers are washed under high pressure when returned, so the tags need to be waterproof.
3) On-metal tags are generally used for the cage trolleys, but these are expensive.

They overcame each issue and lowered the initial cost as much as possible by choosing waterproof tags. By using a low-cost label, these could be applied to a large number of foldable containers. For cage trolleys, they decided to attach the tags on the destination board which is made of a non-metallic material.

Reasons for Using GRAI

Co-Op Tohoku made a forward-looking decision to use GRAI in order to uniquely identify their transport assets because they wanted to make their system compliant to open supply chain standards. Although the new system is now only used for closed and in-house distribution, Co-op Tohoku expects that the new center will be used for joint distributions with other co-operatives and that it will handle transport equipment managed by other companies.

Automatic Scanning When Leaving the Distribution Center

Under the current management system for the transport equipment by using the EPC/RFID, the tags are scanned when the equipment enters and leaves the distribution center.

The process of taking the equipment out of the distribution center became more efficient by using an "automatic stacking device gate for the foldable containers used for stores".

This stacking device gate automatically scans the roll cages and the foldable containers that will be transported and links them to the information about the delivery locations. It automatically and accurately scans the order of the roll cages that will be transported one by one. A tablet placed on the side of the gate then immediately shows the number of pieces of equipment that have been scanned. When the gate cannot scan a piece of equipment, a warning light and alarm will be set off.
The gate was made to be resistant to wear, and with consideration to the direction of the radio waves. Consideration was also applied to the way in which the antenna would be set up and how the gate scans the equipment, to improve the accuracy of the scanning.

Improving Trust between the Distribution Center and the Stores

Although there is no comparative data for the newly launched center, there have been “non-visible improvements in the distribution efficiency” and there have been no more losses of equipment as a result. Particularly significant is the fact that the mutual mistrust between the center and the stores has been resolved by this strengthening of the management.
In the future, analyzing EPD/RFID data is planned. This will help to determine the appropriate quantity of the transport equipment, and resolve any delays in shipments due to transport equipment shortages during busy periods, as well as mistakes caused by the use of substitute equipment.
As stated earlier, the center began its operations in September 2015 and was in full operation by May 2016.

Towards Further Improvements in Efficiency

Among many cooperatives, Co-op Tohoku is one of the most proactive in pursuit of advanced measures to improve distribution efficiency. They are considering

Fig. 1.3.1-1 Co-op Tohoku's Sunnet Federation Dry Integrated Distribution Center

Fig. 1.3.1-2 Flow of the Transport Equipment

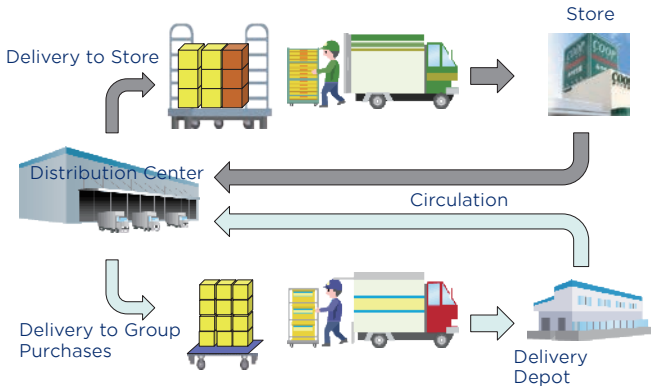
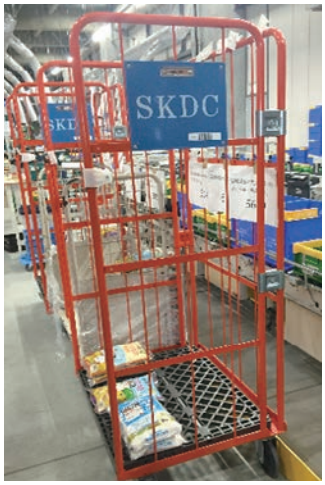


Fig. 1.3.1-3 Cage Trolley with an EPC/RFID tag on the destination board



By using the same tag as that for foldable containers instead of on-metal tags, the costs were reduced.

Fig. 1.3.1-4 Scanning foldable containers

Returned foldable containers are scanned using a hand scanner.

implementing other tools in their system.
One measure, which was not implemented at this time, is a “group purchase gate”. This is a device that scans 100 foldable containers at once, when they are returned from delivery to group purchases, and controls the range to be scanned by using a moving transfer tag identification software which can recognize the movement of tags. The gate recognizes only the foldable containers that are moving in front of the gate, and can even distinguish foldable containers that are just left nearby and not to be read.
The reason why this measure is not implemented at the present time is the cost. This issue is unavoidable for the spread of RFID. However given the need to reduce the workload of the distribution center staff, and considering that labor shortages may be a concern in the future, the automation of the functions at the distribution center is both likely and desirable.
“If there is a base, it is easier to proceed to the next step.” Therefore, these challenges will continue to be pursued in the future.

1.3.2 Visibility Verification Experiment in the Japanese Sake Supply Chain

GS1 Japan, along with a number of system vendors and academic institutions, carried out a verification experiment to ensure the distribution channels for Japanese sake are visible and to enhance anti-counterfeit measures, quality control and information sharing with local consumers. In the verification experiment, Japanese sake from Shata Shuzo Co., Ltd. (“Tengumai” brand) and Masuda Shuzo Co. Ltd. (“Masuizumi” brand) were exported from Japan to Bangkok, Thailand. The distribution data from each distribution base between the two countries was then collected for EPCIS on the cloud system. On July 10, 2015, a Japanese sake-tasting party was held as a debriefing session for the verification experiment at a hotel restaurant in Bangkok.

Why is Visibility Necessary?

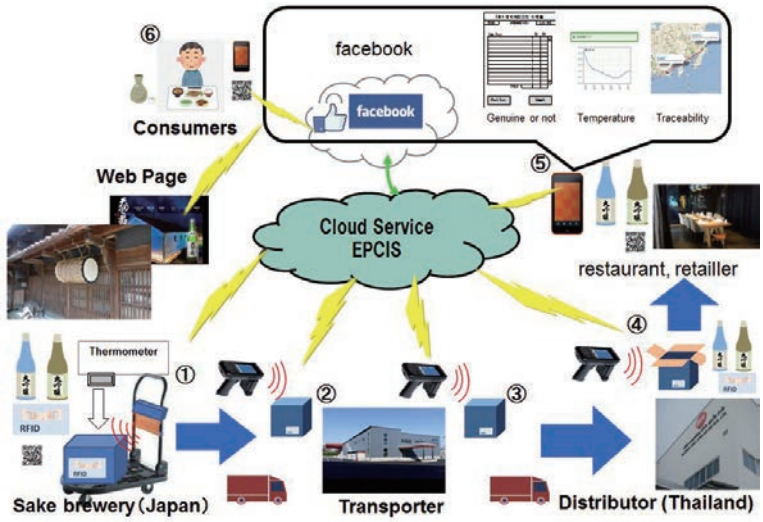
Information guaranteeing the security and safety of the products will contribute to an increase in the product’s value. It has become necessary to gather information about the production stage, the distribution channels and the distribution processes (for example, the temperature), and to develop simple and appropriate quality control measures for any level of consumers, distributors and producers based on this information. In addition, the spread of counterfeit products is becoming a major issue in international trade. Products of an inferior quality are being sold on the market as if they were real, which can damage the image of Japan’s brands and threaten the security and safety of the food. Holography technology has been developed to prove the authenticity of certain products, but such holography is also now being counterfeited, which creates a vicious circle. Given this situation, a new type of technology is needed to monitor whether a product has passed through each distribution point correctly, and the visibility of the distribution process from the producer to the distribution channel and to the retailer is an important key to developing the appropriate anti-counterfeit measures.

Verification Experiment

In this verification experiment, an EPC/RFID tag attached to each product was scanned when the product arrived at a specific location in the supply chain. Information showing that the product had arrived at each specific location was then documented on the computer server. Through this process, counterfeit products with uncertain distribution channels, or those that did not go through the specific locations in the supply chain, can be detected.

Fig. 1.3.2-1 Scenes from the debriefing session in Bangkok, Thailand

Fig. 1.3.2-2 Diagram of verification Experiment



1. Sake Brewery
An EPC/RFID tag was also used to seal the product, in order to enable the traceability of that product from its shipment stage, and to make it clear if the content was switched with a counterfeit product. At the same time, the product was packaged in an outer case with a temperature measurement device (a temperature logger) enclosed with the product. When the product was shipped, the electronic tag on the outer case and the Japanese sake in the individual packing box was linked with a voucher number, while the scanning location (GLN) and the date and time of the shipment were sent to the computer server (cloud).

2. Transporter (Warehousing)
At the storage facility near Narita International Airport, all of the products sent from the sake breweries were inspected at the time of storage by scanning the electronic tag attached to the outer case, while the scanning location and the date and time of the shipment were sent to the computer server. In the verification experiment, some outer cases and individual packing boxes were opened for testing purposes, and some Japanese sake bottles were also opened and tested.

3. Distributor (Delivery from the Warehouse)
After the flight for the shipment of the sake to Thailand was fixed and the Air Waybill number was confirmed, the products were shipped from the storage facility located near Narita International Airport. At this time, the scanning location and the date and time of the shipment were sent to the computer server using an electronic tag reader. Since this was a verification experiment, the shipment was made by air to save on the overall transportation time.

4. Agent (Distributor)
The Thai agent (distributor) received the Japanese sake at the airport and then stored the products in its own storage facility. At this time, the temperature data along with the scanning location and the date and time of the shipment were scanned and sent to the computer server.

5. Restaurant, Retailer
Since there is a QR code, along with the electronic tag, on the label of the Japanese sake, it is possible to access a website that shows the information about the distribution process by scanning the QR code with a smartphone or a tablet. The website is also linked to Facebook, making it possible to access information about the Japanese sake and send feedback to the sake breweries.

6. Consumer
Consumers are also able to access various kinds of information about the Japanese sake by using the QR code, and to enjoy drinking the sake in restaurants.

1.4 New Industry

1.4.1 Case study: Improving Product Safety with the GS1 QR Code

GS1Japan has been propelling GS1 standards introduction and implementation locally in Japan. GS1 QR Code is one of the GS1 Standards we promote in recent years. 2-D symbols such as QR Codes are well known to and used worldwide especially in mobile

because of higher data capacity and smaller size. GS1 QR Code is one of the choices of the GS1 Standard 2-D symbols. However, it is still not deployed in Japan, the birthplace of QR Code.

We have engaged industry people seeking the way to implement GS1 QR code in Japan and found that local knifeware manufacturers in Sanjo City (*1). The manufactures are looking for solutions to easily identify products and lead customers to the necessary information. They are proud of the qualities of their products but having difficulty to deliver sufficient product information to the customers. They also wanted retail store associates to have access to good product information so that they can be confident in front of customers to sell appropriate knifeware to the customers.
GS1Japan is involving the manufacturers and stake holders (i.e. Sanjyo City Office, the Chamber of Commerce and Industry of Sanjo and the Industry Body in Sanjo) and proposed them to utilize GS1 QR Code as a way to access the information they want to offer. In parallel, we contacted document creating organization (*2) that is capable of creating product manuals in multi-languages. Also, for reading and processing GS1 QR code encoding GTIN of the product and URL, we involved application program creator (*3) who is a daughter organization of JTDNA.
JTDNA created professional manual in multiple language and TDN created an application program (mobile App) named "scodt.", that is capable of reading GS1 QR Code. The App is designed for both Android and Apple iPhone which can be download at scodt site for free [http://www.scodt.jp/].

As a result, customers and store associates are able to reach various kinds of information about the product; detailed product information, appropriate usage and maintenance procedures, and recall information where there is any. In addition, they are also expecting sales expansion with this new system.

To date, more than 20 types of products are carrying GS1 QR Code with GTIN and URL. This is the first but big successful kick start for use to implement GS1 QR Code for mobile application.
There are many other organizations contacting us hearing of this simple, quick and successful system which helps brand owners to communicate better with customer throughout the product lifecycle in a user friendly way.

We will continue to promote the use of GS1 standards in mobile for the industries to deliver both brand owners and customers more values.

Fig. 1.4.1-1 Distributed Leaflets

*1 Sanjyo city is located some 300 km (190 mile) north from Tokyo facing to Japan Sea, where famous traditional festivals and tasty foods can be enjoyed.
*2 The Japan Technical Designers Association (JTDNA) [http://jtdna.or.jp/]
*3 TDN International Ltd. [http://tdn-japan.com/]

2. Service & Solution

2.1 Start of Online Applications

GS1 Japan began accepting online applications to register GS1 Company Prefixes on October 1, 2015. As a result, the number of new users has increased and the administrative work has become more efficient.
Until that time, the only way to apply for a GS1 Company Prefix was by submitting a paper form for registration application. The previous procedure of applying for a GS1 Company Prefix was as follows:
1. Obtain (buy) a registration application form.
2. Pay the registration application fee by a bank transfer.
3. Fill in and submit the registration application form.

There were several problems with the previous application process for the GS1 Company Prefixes.
First, the procedure was complex for the applicant. The registration application form was attached to the GS1 Company Prefix manual, and to obtain the form, the applicant needed to purchase the manual. The applicant also needed to pay for the manual, on top of paying for the registration application fee, which doubled the financial burden.
There was also a burden on the receiving side (GS1 Japan). The information written on the application form needed to be converted into data and sent to the management system, but the information could not be properly converted into data if the handwriting was difficult to read or if any information was missing. Therefore, the content of the application forms needed to be checked, which required a considerable amount of work.
Another problem was that exchanges of the registration application form and the registration notification letter were conducted through mail, requiring considerable time for the GS1 Company Prefix to be sent to the applicant.

The flow of the online applications is as follows:

The introduction of online applications has automated the systematic checking of almost all possible items, which has successfully eliminated the need for employees to read handwritten information, resulting in a considerably reduced burden for the receiving side. Also, the applicant no longer needs to obtain or mail in the registration application form, and it takes less time to be notified of the GS1 Company Prefix after applying.
This reduced burden and improved convenience for the applicants has helped to increase the number of registration applications. The year-on-year change in

Fig. 2.1-1 Registration application form used in the past

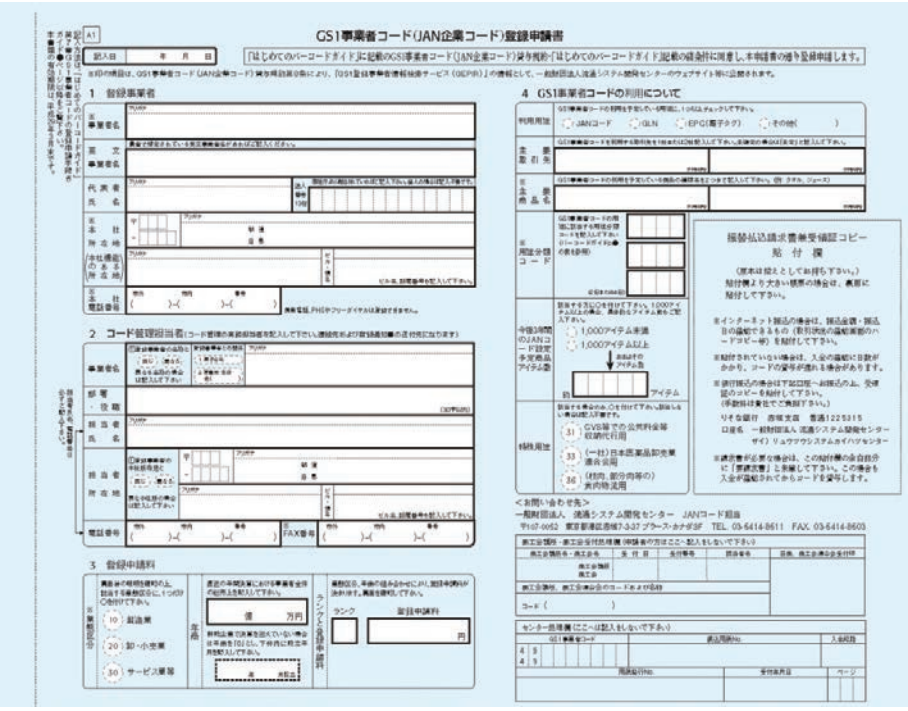
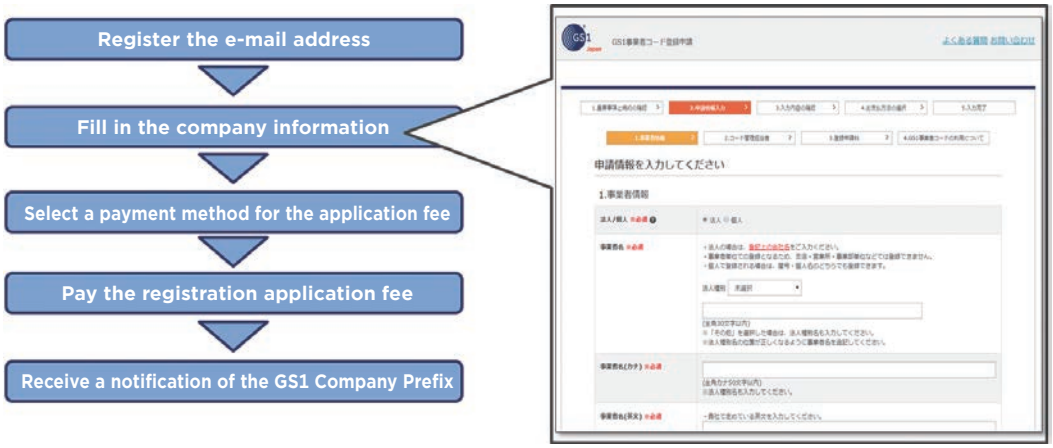


Fig. 2.1-2 Flow of the online application



the number of registration applications was 105 percent before the introduction of the online applications; but after the online applications, the year-on-year change rose to 122 percent. The number of applications now exceeds 1,000 per month. In March 2016, the percentage of online applications, out of all applications for GS1 Company Prefixes, was about 80 percent. Applications using the former registration application form will continue to be available for those applicants who have difficulties using a computer, and for those who need to register with a paper form for the convenience of their company procedures, but the percentage of online applications is expected to rise further in the future.

2.2 JICFS/IFDB (JAN Item Code File Service/Integrated Flexible DataBase)

Since 1988, GS1 Japan has been operating the JICFS/IFDB database of product catalogues and has been collecting and maintaining basic product data, e.g., GTIN, product names, product categories, weights, and amounts. This database is used for two purposes: POS product masters at retailers and EOS masters between wholesalers and retailers. The JICFS/IFDB database is recently being used for a variety of other purposes, including online shopping portals and for marketing research. Companies operating online shopping portals use GTIN for product information control since stores in their portals manage product information using their own codes and product names. These portal firms also use JICFS/IFDB to unify the management of their product information because the same products have often been registered under different names and categories.

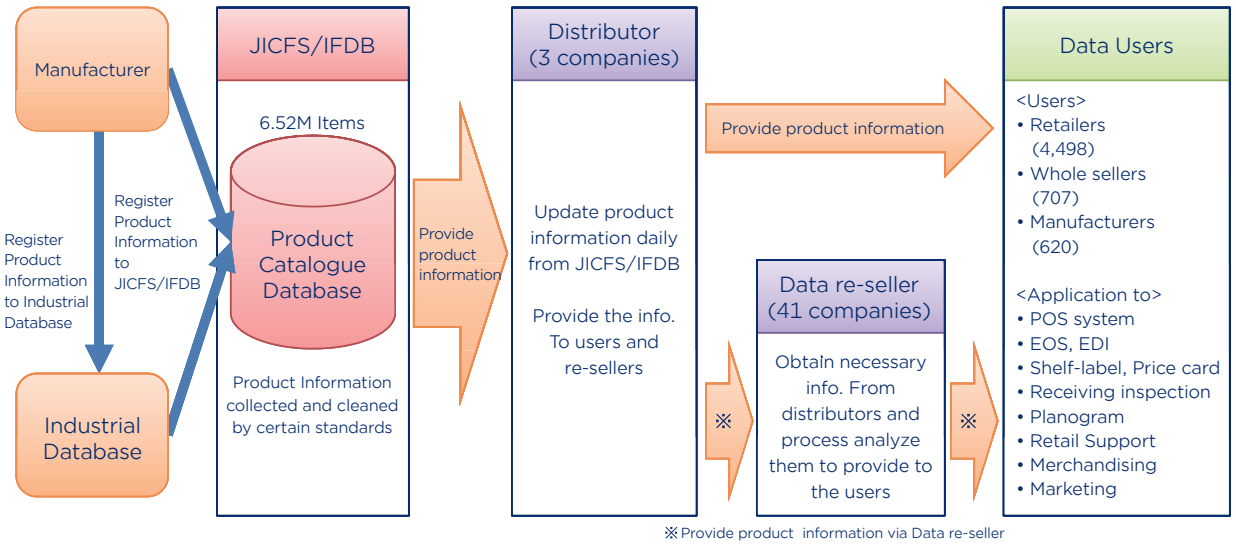
The use of the JICFS/IFDB has been promoted not only in the distribution industry, where the database is already in wide use, but also in the area of social welfare. For instance, this database has been used for voice guidance experiments in which vision-impaired consumers themselves can scan a product's barcode and have their personal computer or other device speak the name of the product.

Product data is collected and arranged according to JICFS/IFDB standards and is then offered at cost to retailers, wholesalers and other users via distributors (Fig. 2.2-1). As of March 2016, product information data registered in the JICFS/IFDB covered over 6 million products from 30,000 manufacturers. About 5,800 companies, of which 77% are retailers and 12% are wholesalers, currently use the database. By using product information managed by the JICFS/IFDB, user companies can perform the communications, inquiries and registration tasks related to product data promptly, precisely and at a low cost. As such, the product information is being widely utilized by small and medium businesses.

The product information in JICFS/IFDB includes JICFS classification codes that indicate product categories. These codes are used as search keys for extracting the necessary product groups, and as aggregate keys for aggregating similar products for data totaling, processing, and analysis.

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

Fig. 2.2-1 JICFS/IFDB system flow



※Provide product information via Data re-seller

	2012	2013	2014	2015	2016
Food	1,123,796	1,209,636	1,291,008	1,371,489	1,465,218
Commodity	628,054	673,700	714,237	759,793	807,882
Recreation and Miscellaneous	382,640	417,922	453,135	492,503	532,678
Durable Goods	211,385	230,718	262,309	281,236	311,321
Apparel, Personal items & Sporting goods	204,713	222,660	245,395	270,240	301,951
Other	4,585	3,315	3,262	3,230	3,172
Active item Total	2,555,173	2,757,951	2,969,346	2,969,346	3,422,222
Inactive Data	3,104,154	3,104,154	3,104,154	3,104,154	3,104,154
Grand Total	**5,659,327**	**5,862,105**	**6,073,500**	**6,282,645**	**6,526,376**
Increase in number of items (year-on-year)	205,569	202,778	211,395	209,145	243,731
Rate of increase (year-on-year)	103.77%	103.58%	103.61%	103.44%	103.88%

2.3 GEPIR

GEPIR, the company database for those who have registered and acquired GS1 Company Prefix, in Japanese language has been accessible since 2003 at GS1 Japan website.
Starting from 2007, the detailed location data for each GLN have been added to it and accessible as well.

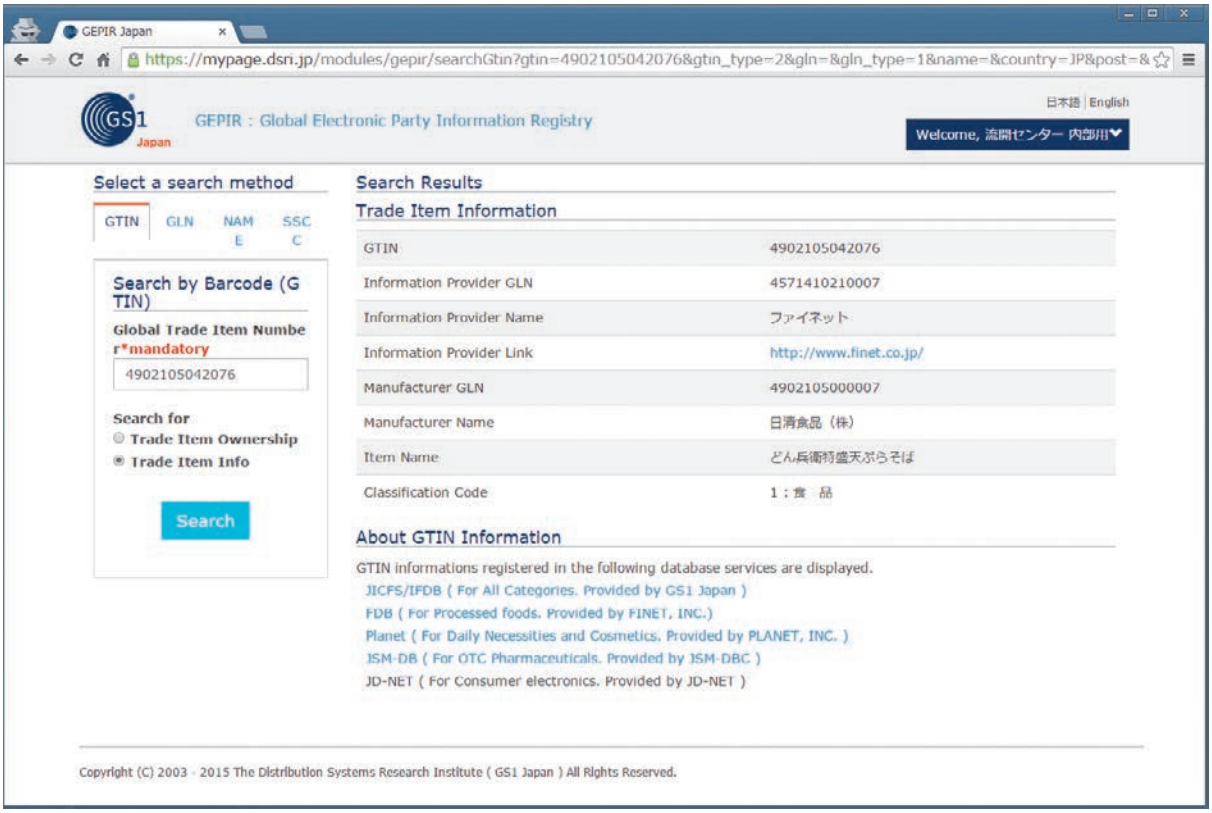
In January 2014, a service was added that allows users to access basic product information through GEPIR. This information is registered in JICFS/IFDB (see 3.1), the product catalogue maintained by GS1 Japan. The main product types in the database include alcoholic beverages, processed foods, commodities, cosmetics, OTC drugs, and home appliances. The following information is available on GEPIR .

- GTIN
- Information Provider GLN
- Information Provider Name
- Information Provider Link
- Manufacturer GLN
- Manufacturer Name
- Item Name
- Classification Code

The search results are as shown in Fig. 2.3-1.

In FY2014, we began the development work for the system replacement. We have shifted to the new service in July 2015.

Fig. 2.3-1 Product Information search result

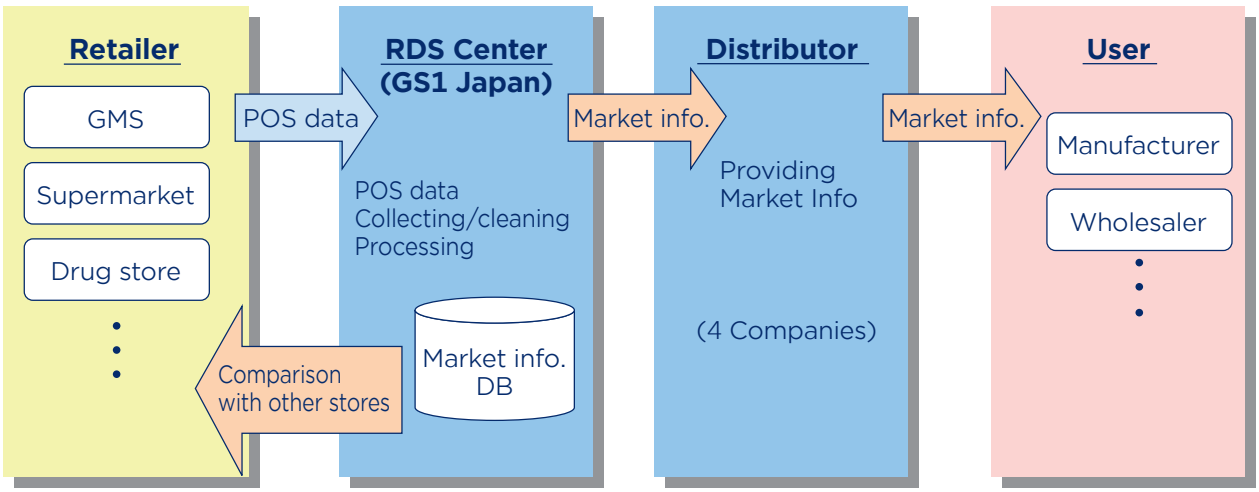


2.4 RDS (Ryutsu POS Database Service)

Outline of the RDS

The RDS (Ryutsu POS Database Service (*1)) is a database service operated by GS1 Japan for the purpose of improving the efficiency in distribution as a whole, with the effective use of POS data and the revitalization of retail businesses (Fig. 2.4-1). The system developments and operational experimentation of RDS began in 1985, before the POS system became widely used, with the purpose of researching and developing a market research service using POS data. The RDS compiles a POS database by organizing the POS data collected from the retailers across the country that handle mainly food and daily goods. This POS database is offered to manufacturers, wholesalers, etc.,

Fig. 2.4-1 RDS system



through the distributors.
The RDS is widely used for marketing purposes by the manufacturers, for retail support by the wholesalers, and for merchandising purposes by the retail businesses. In addition, it is used for studies of big data and analyses of consumer prices by universities and research institutions.
The “sales information for the region”, which can serve as an effective indicator for a retailer to conduct comparisons with others in the region, is offered to all retail businesses that provide the RDS with POS data.

1. Collecting and Organizing POS Data with the RDS

Retailers taking part in the RDS include general supermarkets, grocery stores, convenience stores, drug stores, etc., with a particularly high participation of grocery stores. As of the end of January 2016, about 90 retailers (370 stores) took part in the RDS, and about 6 million lines of POS data were collected per week.
The RDS conducts operational checks on the data (manually and by automated programs) to improve the accuracy of the collected POS data. The data is checked for mistakes in the date, significant changes in the Data volume from the day before, and large fluctuations in the sales amount or the unit selling price. In addition, to ensure that the latest product information is used to analyze POS data, The RDS has started to check whether or not research is needed on the product information, by judging (from the interval between POS data) if the JAN code is not used for other products.
RDS receives product information from the JICFS (JAN Item Code File Service) (see 2.2), which is a product database operated by GS1 Japan.

2. RDS Usage

Classification	Method of Usage
At manufacturers	To recognize trends in the sales of new products; for marketing purposes, such as analyzing the market share of competitors’ products To support wholesalers and retailers with information
At wholesalers	For support such as the selection of goods, and the shelving allocation for retailers To recognize the best-selling products by region and business category
At retailers	To recognize the best-selling items To design stores, and to organize shelves that respond to the consumers’ needs
At universities and research institutions	To analyze consumer prices and consumer trends To study big data

3. Service for Retailers Participating in the RDS

The RDS provides its participating retailers with a “sales performance in the region” feature, which is a collection of POS data gathered by the RDS and categorized by region. The POS data analysis service, “comparing and inspecting stores” (developed by the RDS), is used when offering the “sales performance in the region” to the retailers (Fig. 2.4-2).
The POS data analysis service was developed by the RDS based on feedback from the retailers and focused on ease-of-use for the store managers and buyers who actually use the data. The data in the POS data analysis service is presented in both Excel and CSV formats, making the data easier to work with when performing other analyses.

Fig. 2.4-2 Example of the Online POS Data Analysis Service

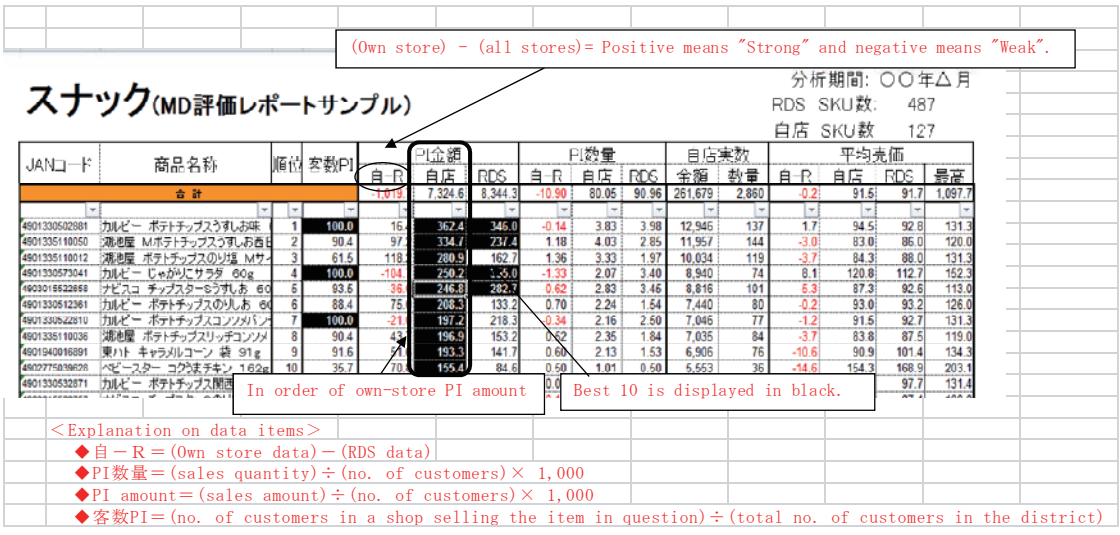


Fig. 2.4-3 Sales floor after the improvement

Retailers participating in the RDS can use the data from the POS data analysis service to share information within the company using SNS, and to compare the data with their own performance. By comparing POS data from their own stores with data from the POS data analysis service, the retailers are able to identify problems in areas such as their selection of goods and price settings, which can be difficult to identify with just their own POS data.

4. Case of a Retailer Participating in the RDS

The RDS organized a workshop on the use of POS data, which many small- and medium-sized retailers considered to be difficult. Members of the workshop include the retailers participating in the RDS, their clients (wholesalers, manufacturers), system vendors and consultants.

The workshop analyzed POS data from the retailers participating in the RDS by using the POS data analysis service. It then inspected the retailers' methods, processes and challenges for using POS data to select their goods and promote sales. Through a continuous analysis of POS data, these companies can: 1) recognize a problem; 2) come up with countermeasures and implement them; 3) assess the effect of the countermeasures that were implemented; and 4) search for further improvements. In this way, many retailers are able to achieve improvements on their sales floor (Fig. 2.4-3).

2.5 History and Current Status of EDI in Japan

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.

2.5.1 Development of Ryutsu BMS

The JCA Protocol drawn up in 1980 became widespread as an EOS for retail businesses.

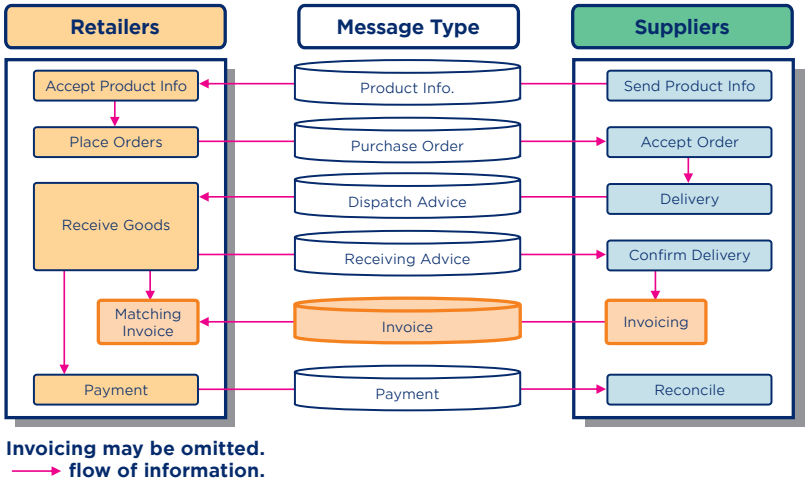
In 1990s, the business procedures covered by EDI expanded from the EOS to the shipping and receiving of goods, invoicing and payments. However, from the late 1990s to the early 2000s, the following problems with the system were identified:

- 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

*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.

Fig. 2.5.2-1 Typical Turnaround Business Processes and Ryutsu BMS Messages between Retailers and Suppliers



・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), the Ryutsu BMS were created as the new EDI standard in April 2007. The Ryutsu BMS is now being increasingly adopted throughout the Japanese retail industry.

2.5.2 Outline of the Ryutsu BMS

The Ryutsu BMS define the following:

Communication infrastructure

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

・Server-to-Server Protocols: ebMS and AS2

・Client-to-Server Protocol: JX Protocol (*3)

In addition, guidelines for secure internet communications were prepared, and the use of three certificate authorities that met the guidelines were 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.

2.5.3 Efforts to promote the Ryutsu BMS

GS1 Japan, together with the Ryutsu BMS Council (see 3.2), have taken various efforts to encourage the wider use of the 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 the Ryutsu BMS users and solution providers.

・Promotional materials:

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

2.5.4 Users' commitment to the Ryutsu BMS

According to a survey conducted by GS1 Japan, 182 retailers and 226 wholesalers or manufacturers have

*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 the Ryutsu BMS.

already adopted or intend to adopt the Ryutsu BMS. The details of this survey are described in Fig 2.5.4-1.

2.5.5 Connecting the retail industry with the banking industry using the Ryutsu BMS

GS1 Japan is now working on the standardization of the EDI infrastructure which will go beyond the retail sector. Thanks to the diffusion of an XML-based Ryutsu BMS, more and more exchanges of trade transaction information between retailers and suppliers have been automatically processed in Japan. However, between companies and banks, EDI standards that use fixed-length message and public phone lines are still common. The message format allows for only 20 characters of information regarding the payment. Therefore, no more than a reference code and the total payment amount can be entered. Linking payment details for information regarding the payment and the trade transaction information is also difficult. As a result, when the payments were received from buyers, the suppliers were often unsure about which trade transaction the payment was for, and whether the items balanced or not. These cases make the bank reconciliation and accounting work inefficient. Under such circumstances, the banking industry has been considering utilizing a financial EDI with the internet for a long time. The 6th Generation Zengin System*, which came into operation in November of 2011, makes it possible to send and receive information in an XML format

Fig. 2.5.4-1 Number of Companies with their Names Made Public (As of Jan. 4, 2016)

Retailers

Classification	Implemented	Planning to Implement	Subtotal
1. Supermarket	123	12	135
2. Department Store	9	2	11
3. Drug Store	24	0	24
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	2	0	2
Total	**168**	**14**	**182**

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	30	2	32
7. Household Goods Wholesaler/Manufacturer	10	1	11
8. Packaging Materials/Secondary Materials Wholesaler/Manufacturer	15	7	22
9. Toys/Hobby Goods Wholesalee/Manufacturer	3	0	3
10. Home Electric Appliances Wholesaler/Manufacturer	2	0	2
11. Other Wholesaler/Manufacturer	2	0	2
Total	**202**	**24**	**226**

* Zengin System: Inter-bank network system that allow individuals or companies to request transfers with financial institutions.

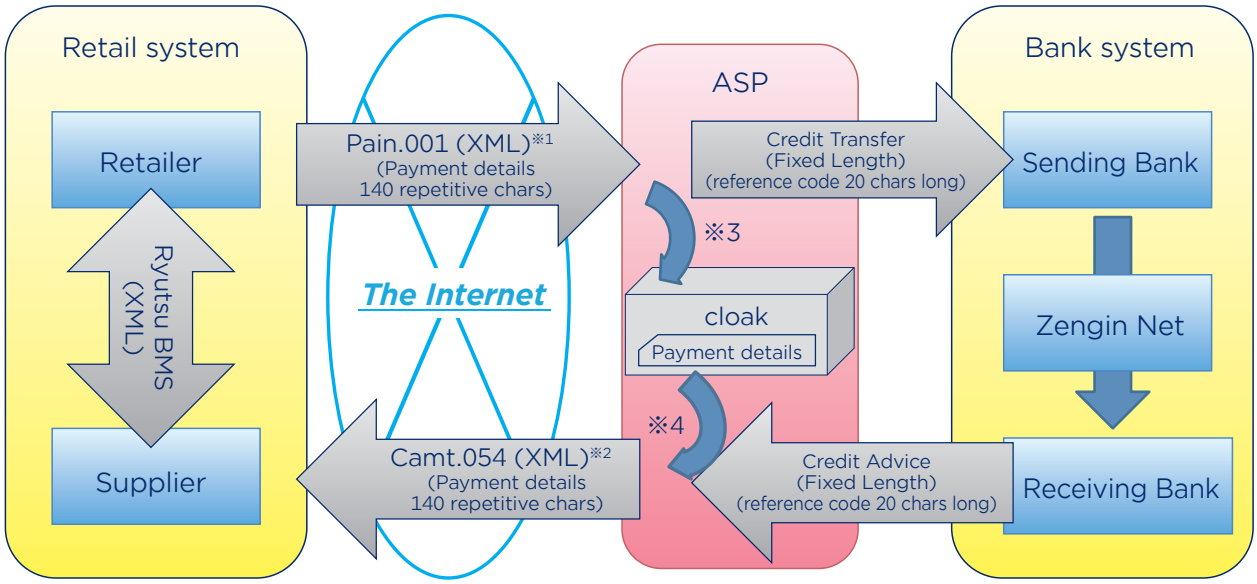
(ISO20022). This system significantly increases the amount of payment information available in messages from 20 characters (allowing for a reference code) to 140 repetitive characters (allowing for full payment details). As this example shows, an environment that will enable mutual data utilization with industries is starting to be established.

GS1 Japan, in cooperation with the banking industry, conducted a pilot in fiscal year 2014/15 to connect the transaction information that was exchanged with the Ryutsu BMS and the settlement information exchanged by companies and banks. In the banking industry, the environment to implement the ISO20022 was not sufficiently prepared, so the information was shared using a cloaking function (shown in Fig 2.5.5-1) that would receive the payment information. Specifically, the following items were studied and confirmed:

1. Rules on the items to be set for the payment information
2. Possibility of the information transfer, according to the system shown in Fig 2.5.5-1

With this pilo, the cooperation between the distribution industry and the banking industry was strengthened, and the distribution industry was able to raise the efficiency of its accounting operations and improve their accuracy, through techniques such as a simplified reconciliation of the account receivables.
Given the results of these efforts, the banking industry is now planning to build a similar system that will begin operations in the fiscal year 2018.

Fig. 2.5.5-1 Using "cloak" to communicate trade information between retailers and suppliers using ISO20022 messages



※1 ISO20022 pain.001 (Credit Transfer)
※2 ISO20022 camt.054 (Credit / Debit Notification)
※3 Cloak stores details of the payment (140 chars repetitive) and pass 20 char long reference code to bank system.
※4 Upon receiving reference code, cloak pass details of the payment (140 chars repetitive) to retail system.

3. Community Engagement and Standard Implement

3.1 GS1 Japan Partners

In April 2015, GS1 Japan launched the programme "GS1 Japan Partners", mainly for solution providers. This programme 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 2015/16 is 99, including many of the major solution providers representing Japan. (Fig 3.1-1)

3.1.1 Activities of the GS1 Japan Partners

Under the GS1 Japan Partners membership system, GS1 Japan annually hosts four regular seminars and one site visit. It also holds non-regular seminars. The seminars, in which key persons in the distribution industry are invited to take part as speakers, and experts give lectures on topics that are seen as having a big impact on the distribution industry, have enjoyed a good reputation.

In addition, as part of GS1 Japan's efforts to share information, it has distributed reports on its regular seminars and publications from GS1 Japan, such as "Ryu-Kai Center News", "Distribution and Systems" and "Trends in Distribution Information Systematizations" (see 3.8). Furthermore, as part of its efforts to support the sales of member companies, GS1 Japan has introduced these companies and their products on its website and allows the companies to display their

Fig. 3.1-1 Membership Structure (as of March 2016)

Sales	Number of Members
Less than 1 billion yen	33
1 billion – 10 billion yen	28
10 billion – 1 trillion yen	32
1 trillion yen and above	6
Total	**99**

Fig. 3.1-2 Events in Fiscal Year 2015/16

	Event Name	Main Topics/Lectures
2015/7	Founding Commemoration Seminar	About GS1 Standards, etc.
2015/7	GTIN source marking Seminar	Marking on light packages of food About revisions to a marking manual
2015/8	1st Regular Seminar	Increasing brand strength using GTIN, etc.
2015/9	EPC/RFID Seminar	EPC/RFID implementation, etc.
2015/10	2nd Regular Seminar	EDI
2015/11	3rd Regular Seminar	Special feature on trends in GS1 Standards
2016/1	Site Visit	EPC/RFID in apparel companies
2016/3	4th Regular Seminar	T&L

Fig. 3.1-3 Founding Commemoration Seminar

Fig. 3.1-4 FY2015/16 Site Visit

products at the GS1 Japan's booth at Retail Tech, the largest trade fair for distribution systems in Japan, at a discounted price.

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 the Ryutsu BMS (see2.5.3), 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 2016, the council has 49 full member organizations. In 2015, 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 2015, 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 the 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 the Ryutsu BMS via communications circuits.
3) Promotion Working Group
   This group examines and implements steps to encourage wider adoption of the 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 2.5.3.

Registration of the Ryutsu BMS trademark
GS1 Japan has registered the Ryutsu BMS logo to be used for products and services that comply with the Ryutsu BMS specifications. As of January 2016, there are 118 products accredited and permitted to use the logo.

Fig. 3.2-1 Organizational Structure of the Council

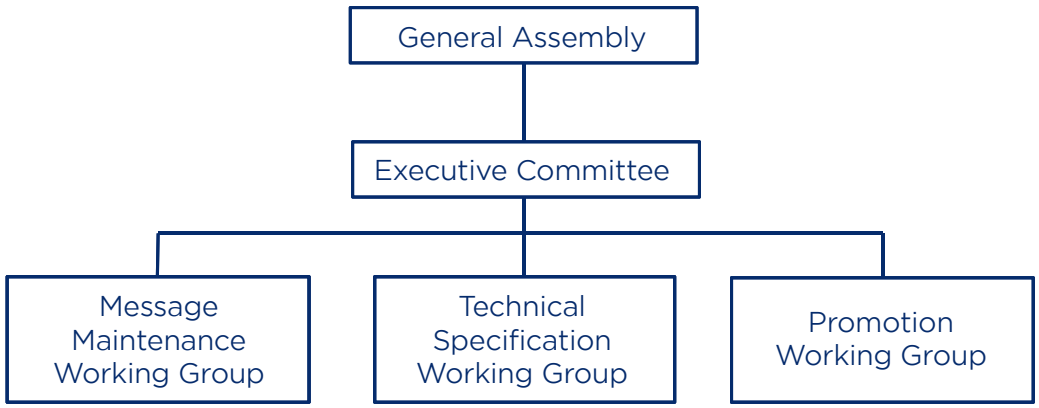


Fig. 3.2-2 Ryutsu BMS logo

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 system vendors. The group works with GS1 Healthcare, the Ministry of Health, Labour and Welfare and other institutions to promote standardization in order to ensure patient safety, secure traceability, and enhance the efficiency of distribution and medical administration within the medical industry.
As of January 2016, GS1 Healthcare Japan consists of 98 members.

Activities

Within GS1 Healthcare Japan, the International Standards and Regulations Study Work Group and the Medical Solutions Study Work Group mainly conduct research on the trends in international regulations and standardization, while aggressively promoting measures to improve safety and the supply chain efficiency in the medical industry, both domestically and internationally.
Activities of GS1 Healthcare Japan

- 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
- Hosting observation/investigation tours

Observation/Investigation tours for the operation systems of medical institutions, distribution centers, etc.

Topics in 2015/16

In the fiscal year 2015/16, GS1 Healthcare Japan tried several challenges toward healthcare providers to promote GS1 standards usage in hospitals, in addition to the regular meeting and the activities such as making manuals and pamphlets, and hosting observation tours..
In November 2015, the group co-hosted a workshop titled “Using Codes on Objects and Locations – Taking Advantage of GS1 Barcodes in the Medical Field” with the Japan Association of Medical Informatics at the 14th Annual Conference of the Japan Association for Medical Informatics. In March 2016, it held an open seminar titled “Current Status and Issues Concerning the Identification and Traceability of Medicines for Medical Use – the Use of the GS1 DataBar and Its Outlook”. Also, as part of its efforts to communicate internationally, the group presented the “Technical Guideline on Direct Marking for a Two-Dimensional Symbol on Steel Instruments” written by the Japan Association of Medical Device Industries (JAMDI) at the

Fig. 3.3-1 Governing structure of GS1 Healthcare Japan

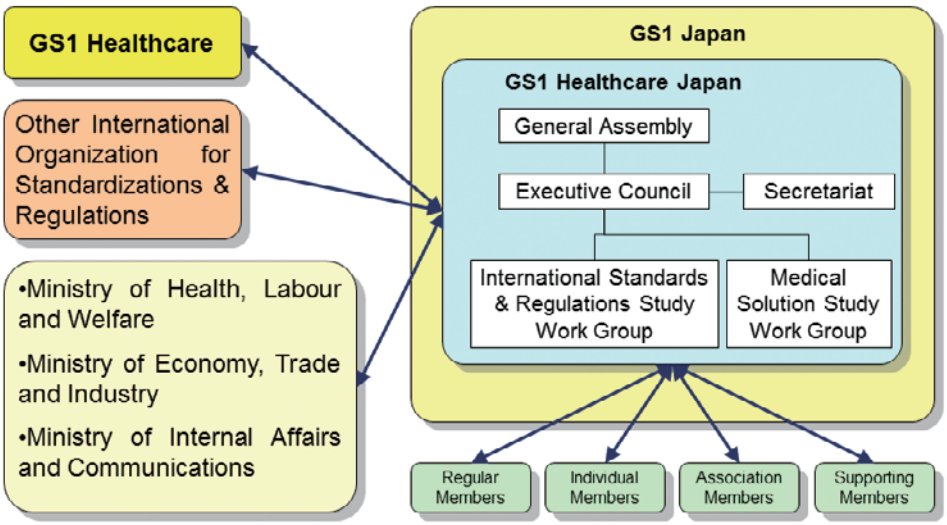


Fig. 3.3-2 The 14th Annual Conference of Japan Association for Medical Informatics

Fig. 3.3-3 Open Seminar

GS1 Healthcare Global Conference in Budapest.

3.4 ICT-Oriented Wholesale Industry

In 1985, we 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 FMCG in different industries (foods, pharmaceutical products, etc.), and the membership is currently about 40 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 "enhancing the wholesale function as a social infrastructure through collaborative efforts", the study group worked on the following 6 topics in FY2015.

- Promoting the wide-spread use of Ryutsu BMS: promoting usage on the occasion of the PSTN migration
- Using smart devices: changes in the sales style, as substitutions for PCs
- Outlook for information system departments, their future role and human resources development
- Maintaining and increasing accuracy and improving efficiency in warehousing operations
- Countermeasures for labor shortages and rising distribution costs moving toward 2020
- Countermeasures for the reduced tax rate in the consumption tax policy

Fig. 3.4-1 ICT-Oriented Wholesale Industry 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 FY 2015, 3 working groups addressed the following topics:

The first working group is the Processed Food Working Group.
This working group aims to promote continuous implementation result reports on returned product reality investigations, follow-up result reports on returned product reduction implementation plans in various companies, the extension of expiration dates/ markings of the month and year, progress reports on the delivery due revisions, reports on transportation optimization examples, etc.

The second working group is Daily Commodity Working Group.
This working group aims to promote continuous implementation result reports on returned product reality investigations in which OTC pharmaceutical products are added to the conventional daily commodities, follow-up result reports on returned product reduction implementation plans in various companies, summary result reports on the various initiative examples of returned product reductions, reports on examples of transportation optimization, etc.

The third working group is the Product Information Multiple Languages Working Group.
This working group is studying ways in which product information can be offered, and how a common infrastructure can be built and managed with cooperation among the manufacturers, wholesalers and retailers, for the purpose of providing product information in multiple languages to further increase the shopping demands from foreign visitors to Japan.

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 2016. 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

3.6 Information Systems in Food, Beverage, and Alcohol Industry

This study group is a voluntary 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. Therefore, the study group has a system for continuous consultation with the Japan Processed Foods Wholesalers Association, a national organization of processed food wholesalers. 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

Fig. 3.6-1 Regular meetings

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.

3.7 User Support

GS1 Japan hosts several courses and seminars for businesses that use the GS1 Standards.
The courses and seminars that are held on a regular basis are as follows:

- Barcode Introductory Course
- EPC/RFID Introductory Course
- Ryutsu BMS Introductory Course
- Medicine/Medical Equipment Barcode Management Seminar

The “Barcode Introductory Course” is a basic course that aims to promote the widespread use of the GTIN. The course offers an opportunity for learning about barcodes to companies that have newly acquired a GS1 Company Prefix and who wish to “use barcodes and study the basics” or “to learn how to display the barcodes on products”. The course is held regularly in Tokyo and Osaka. GS1 Japan also offers “visiting lectures” when they are requested at a designated place, date and time.

The “EPC/RFID Introductory Course” is a course designed mainly for beginners, and aims to deepen their understanding of the use of EPC/RFID to improve operational efficiency. The course, which is held mainly in Tokyo and Osaka, explains the characteristics of electronic tags, and offers cases of the introduction of electronic tag systems as examples, as well as explanations about the GS1 Standards. The course also includes demonstrations of scanning multiple barcodes at once, as in the case of receiving shipments and shipping inspections, while providing opportunities for the participants to experience scanning with the electronic tags.

The “Ryutsu BMS Introductory Course” is a course that explains the basics of the Ryutsu EDI, how to use Ryutsu BMS and the effects of implementing this system. The course is mainly designed for the people who will be responsible for the distribution systems in the future, as well as those who are working in the field or at the system departments of user companies considering introducing Ryutsu BMS, and SI companies and consultants who support the user companies. The course is held mainly in Tokyo and Osaka. In addition, a “Ryutsu BMS Implementation Course”, which explains the main points of effectively implementing the Ryutsu BMS while adhering to the standard specifications, is offered as an e-learning course.

The “Medicine/Medical Equipment Barcode Management Seminar”, which began in April 2010 with the establishment of GS1 Healthcare Japan, is targeted at medicine/medical equipment manufacturers, wholesalers, hospital staff and solution providers. The seminar explains the notification from the Ministry of Health, Labour and Welfare that makes the displaying of GS1-128 barcodes mandatory.

Besides the above-mentioned courses and seminars that are held regularly, GS1 Japan also hosts the following events once a year. The main annual events are as follows:

- GS1 Japan Annual Seminar
- EPC/RFID Forum
- Mobile Seminar

Fig. 3.7-1 Barcode Introductory Course

Fig. 3-7-2 Students learn and experience how to scan barcodes

The institute has also welcomed study visits from middle and high school students on several occasions. The "study visits" are part of an educational program that is intermediated by the School Support Center, a specified nonprofit corporation. It is a program in which students can visit public institutions, government offices and private companies in Tokyo, when they come to the city from other regions on school excursions, and can learn about the specific operations of an organization and its role in society. The institute explains the codes to the students and also offers them opportunities to scan the GS1 standard symbols. The responses from the students have been generally positive, including comments such as: "I was able to understand the purpose of the barcodes" and "I felt more familiar with the barcodes".

3.8 Publications

GS1 Japan issues a variety of publications dealing with themes related to GS1 system management and summarizing the SCM-related research in Japan, to this provide information to domestic retailers, wholesalers, manufacturers and IT firms. A selection of the publications currently issued by the institute is shown below.

- Guide to Barcodes for Beginners
- Trends in Distribution Information Systems

Fig. 3.8-1 Guide to Barcodes for Beginners

We also issues two regular publications for the purpose of introducing studies on the latest trends in distribution systematization, such as the GS1 standards system, barcodes, EDI, SCM, EPC/RFID (electronic tags), EPCglobal network systems and databases, as well as the trends in industry standardization, policies and international standardization.

- Bulletin titled "Distribution and Systems" (since 1974), quarterly
- Brochure titled "Ryu-Kai Center News" (since 1982), bimonthly

GS1 Japan has recently produced DVDs that include: "Basics of JAN Code (2015 Edition): JAN Code, Product Code for Assembled Packages"; "GS1-128 Barcode GS1 DataBar: Barcodes Containing Various Information"; "EPCglobal"; and "Ryutsu BMS: Current Status and Outlook". These DVDs are used in courses and seminars, and can also be borrowed free of charge.

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 EDImessages, 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, 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 addition, we have begun a study on the possibility of the service combining mobile communication with the GS1 Standards in cooperation with stakeholders in the mobile industry. DSRI celebrated its 40th anniversary in 2012.

4.2 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 Dayevent 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

4.3 GS1 JAPAN

GS1 Japan joined GS1 in 1978, and acquired the GS1 Prefix “49”. It subsequently applied for an additional prefix in 1992, and acquired the GS1 Prefix “45”.
The institute initially allocated seven-digit company prefixes, but according to the increasing number of member companies and a recommendation from GS1, it began to allocate nine-digit GS1 Company Prefixes to companies in January 2001.
Currently, the nine-digit prefixes are basically allocated to new applicants, but the seven-digit prefixes are still allocated to those companies with 50,000 or more product items.
All of the companies need to take renewal procedures every three years for the continuous use of the GS1 Company Prefixes. As of the end of March, the annual number of newly registered cases was 11,255. Additionally, as of the end of March 2016, a total of 130,246 companies were registered for company prefixes (see Fig. 4.3-1).

In recent years, individual business owners have pushed up the number of new registrations. Individual business owners made up 37 percent of the new registrations in the fiscal year 2015/16. Compared with the 21 percent share of individual business owners five years ago, this represents a significant increase.

The increase in applications to sell products through online shopping sites is also a trend worth noting for new registrations.

The most common product categories for newly registered companies in the 2015/16 fiscal year were: 1) processed foods; 2) clothing; 3) audio visual content (digital distribution, CDs, etc.); 4) daily goods; and 5) confectionary (see Fig. 4.3-2).

Compared with the previously common product categories, “clothing” traded on the Internet showed a significant increase, reflecting the expansion of online shopping. There has also been an increase in applicants who cite Amazon and other online shopping sites as their major clients.
Another trend worth noting is the increase in the applications from manufacturers of agricultural and marine processed goods, and local specialty goods, who are aiming to expand their markets. By applying source-marking to their products, these manufacturers are able to wholesale their products to new markets, such as to roadside stations and direct sales stores for agricultural goods.
GS1 Japan hosts seminars on a regular basis, and also sends staff to give lectures at locations around Japan as necessary for the purpose of promoting the accurate understanding of the GS1 standards. Recently, the

Fig. 4.3-1 GS1 Company Prefix allocation

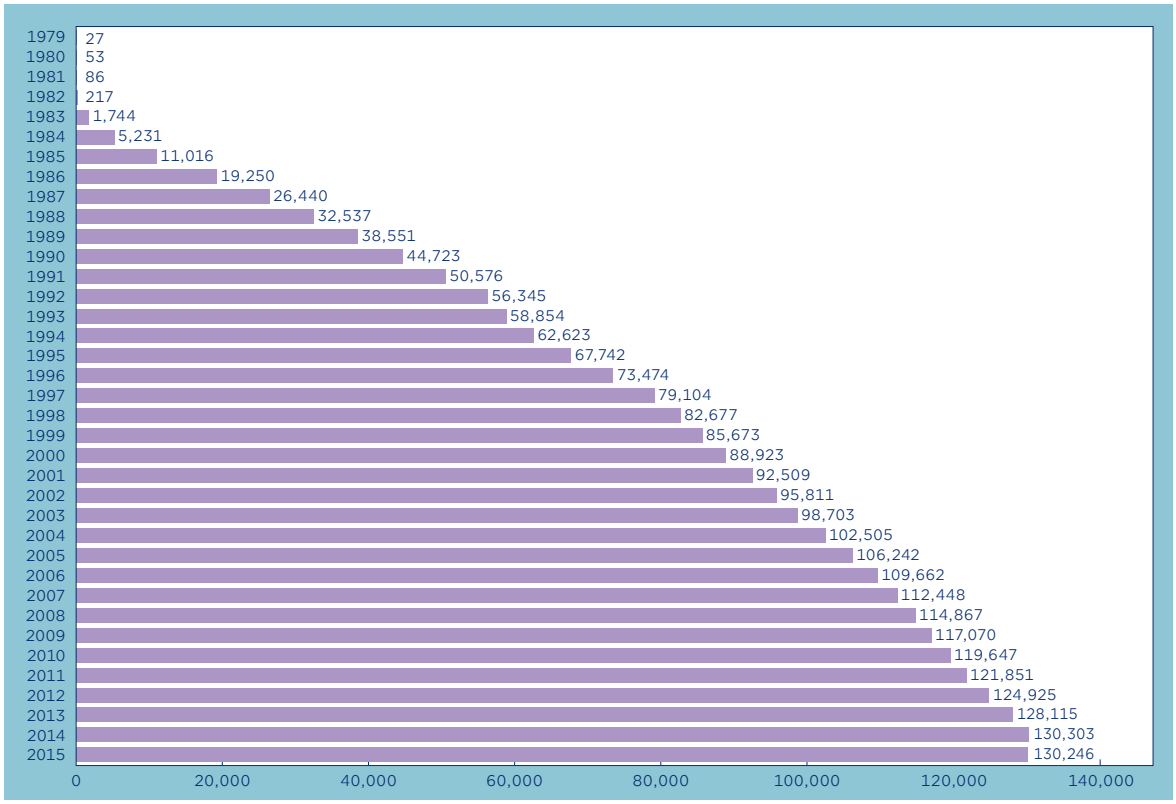
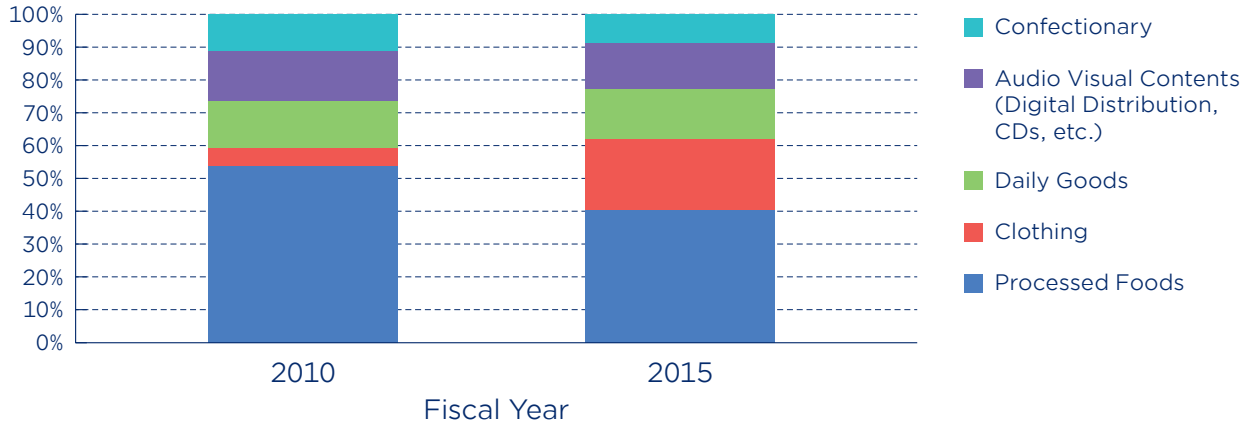


Fig. 4.3-2 Changes in the Product Categories of Newly Registered Companies



number of requests for on-site lectures has been increasing from manufacturers of agricultural and marine processed goods, and local specialty goods, which again indicate the strengthening of this trend. In addition to the expansion of online shopping, the areas with a low rate of source-marking are also expected to begin using source-marking more widely, which will lead to a further increase in the number of registrations for GS1 Company Prefixes.

5. Reference

5.1 Retail Trends Japan 2016

Currently, trends in Japanese retailing related to information systems include omni-channel, reduction in delivery time, diversification of settlement methods and the use of social networking services. Here, among the many trends, we introduce the increase in visitors to Japan and the development of EC (e-commerce) while referring to statistics.

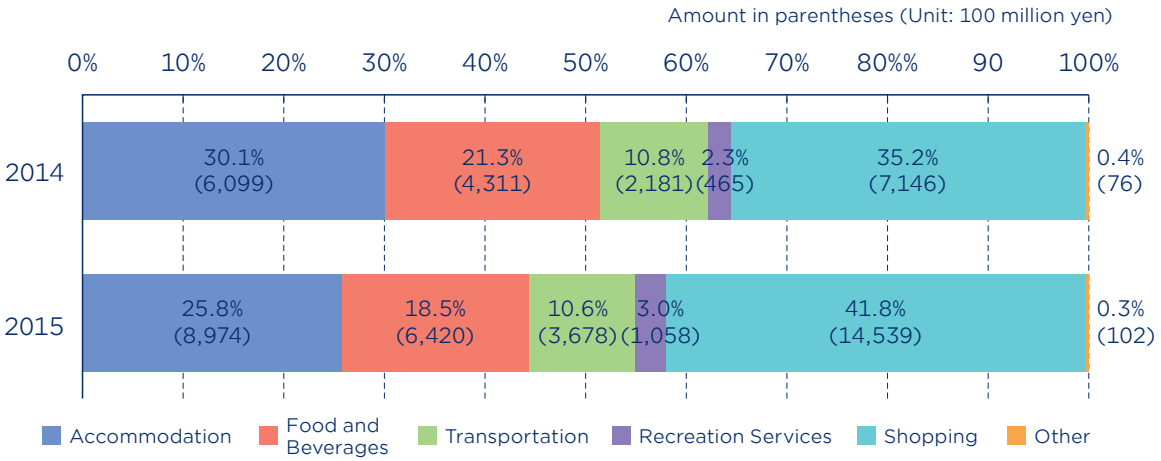
In recent years, visitors to Japan have revitalized consumption in the country. According to the Japan National Tourism Organization, the number of visitors to Japan in the 2015/16 fiscal year rose 45.6 percent to 21.359 million people compared to the previous fiscal year, surpassing 20 million people for the first time since the collection of statistics started. The government had been aiming to increase the number of visitors to Japan to 20 million by 2020, the year Tokyo will host the Olympics, but since the goal was reached ahead of schedule, it was raised considerably to 40 million by 2020 and 60 million by 2030. Tourism consumption by visitors to Japan was up 71.5 percent from the previous year to 3.4771 trillion yen. Of the amount, about 42 percent was spent on shopping, which totaled 1.4539 trillion yen. In a survey of visitors to Japan, "shopping" was one of the biggest purposes of their visits, and they requested more information in multiple languages, quick duty-free processing and a better Wi-Fi environments. GS1 Japan is considering creating a system for providing product information in multiple languages to visitors in Japan, with cooperation from retailers, wholesalers and manufacturers.

There has also been considerable development in EC. According to the E-Commerce Market Survey conducted by the Ministry of Economy, Trade and Industry every year, the size of the EC market for consumers in 2014 rose 14.6 percent to 12.7970 trillion yen compared to the previous fiscal year. Of the total, "sale of goods" was 6.8043 trillion yen (53 percent), "services (travel, etc.)" was 4.4816 trillion yen (35 percent) and "digital contents (online games, electronic books, video Streaming, etc.)" was 1.5111 trillion yen (12 percent). The rate of increase for each category was 13.5 percent for sale of goods, 10.1 percent for services and a notable 37.1 percent for the digital category.

The market size and composition ratio of sale of goods according to product category are shown in the pie chart. The four categories of 1) clothing, fashion accessories, 2) household electrical appliances, audio-visual equipment, personal computers, peripheral equipment, 3) food, beverages, alcohol and 4) general goods, furniture, interior goods make up over 70 percent of the sale of goods in the EC market. The percentage of EC for 3) food, beverages, alcohol rose 20.4 percent in market size compared to the previous year. However, the market size for commercial transactions in this category is extremely large, therefore, the present percentage of EC is small at 1.89 percent and continues to show more room for growth.

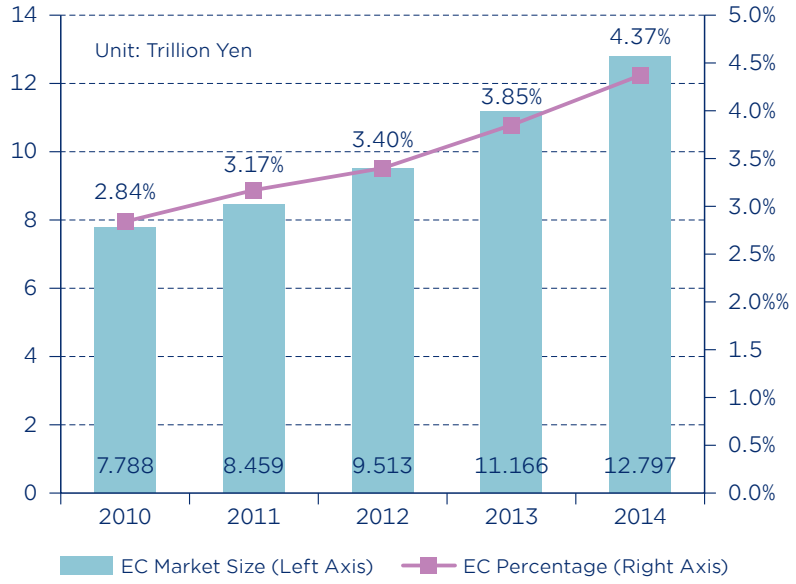
As introduced in "2.1 Start of Online Applications," applications to register for new GS1 Company Prefixes to list products onto online shopping sites are increasing. The top 20 e-commerce companies in Japan are shown in Table 5.2-8.

Fig. 5.1-1 Composition of Tourism Consumption by Category



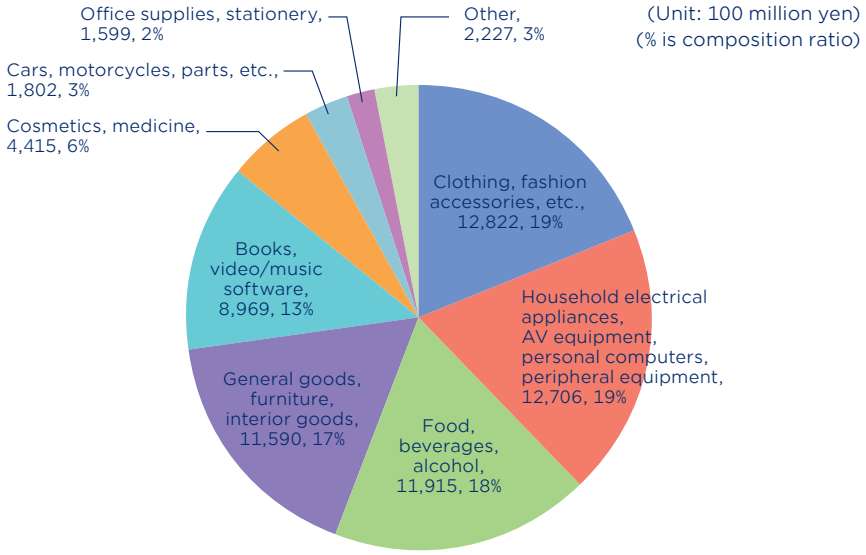
Source: Japan Tourism Agency, *Consumption Trend Survey for Foreigners Visiting Japan 2015*

Fig. 5.1-2 Changes in B2C EC Market Size and Percentage of EC Over Time



Source: Ministry of Economy, Trade and Industry, *E-Commerce Market Survey 2014*

Fig. 5.1-3 Composition Ratio of Sale of Goods by Category



5.2 Statistics on Japanese Retail Industry

Table 5.2-1 Number of stores, number of employees, and annual sales by type of stores (As of 2012)

Type of Stores	Number of Stores	Composition Ratio (%)	Number of Employees	Composition Ratio (%)	Sales\ Million	Composition Ratio (%)
Total number of retail stores	1,033,358					
Total (Scope of calculation by type of stores)	782,862	100	6,055,186	100	110,489,862	100
Department Stores	228	0.0	228,054	3.8	5,487,978	5.0
General Supermarkets	1,122	0.1	237,212	3.9	5,322,537	4.8
Specialty supermarket (Apparel)	7,855	1.0	111,461	1.8	2,078,965	1.9
Specialty supermarket (Grocery)	16,290	2.1	913,882	15.1	16,828,614	15.2
Specialty supermarket (Home furnishing)	10,907	1.4	267,248	4.4	5,181,093	4.7
Convenience Stores	30,598	3.9	486,834	8.0	5,490,078	5.0
Drugstore	14,872	1.9	181,214	3.0	3,803,587	3.4
Other supermarkets	52,409	6.7	371,055	6.1	4,407,643	4.0
Specialty stores (Apparel)	93,594	12.0	359,063	5.9	4,816,909	4.4
Specialty stores (Grocery)	159,807	20.4	642,388	10.6	5,960,474	5.4
Specialty stores (Home furnishing)	369,655	47.2	1,983,435	32.8	40,054,586	36.3
Large specialty store (Electronics)	2,237	0.3	82,838	1.4	5,350,099	4.8
Other retail stores	1,214	0.2	5,364	0.1	77,705	0.1
Non-store retail	22,074	2.8	185,138	3.1	5,629,594	5.1

(*1) "Employees" refer 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.
(*2) Annual sales per employee was calculated based on 8 hours of work by employees such as part-time employees, etc.

Table 5.2-2 Top 20 wholesale companies in Japan (As of 2014)

2014	2013	Company Name	Location of Head Office	Annual sales (¥Million)	Annual Growth (%)	Business Line
1	1	Medipal Holdings Corporation	Tokyo	2,872,905	-2.5	Drugs
2	2	Alfresa Holdings	Tokyo	2,421,162	-3.3	Drugs
3	3	Mitsubishi Shokuhin	Tokyo	2,337,252	-2.1	Grocery
4	4	Suzuken	Aichi	1,969,689	-0.9	Drugs
5	5	Nippon Access	Tokyo	1,784,099	4.1	Grocery
6	6	Kokubu	Tokyo	1,603,433	2.3	Grocery
7	7	Toho Holdings	Tokyo	1,162,148	-2.3	Drugs
8	8	Kato Sangyo	Hyogo	771,514	5.2	Grocery
9	9	Mitsui Foods	Tokyo	753,789	6.6	Grocery
10	10	Nihon Shuppan Hanbai	Tokyo	661,096	-3.1	Books/Audio/Video/Music Instruments
11	11	Arata	Tokyo	638,792	-2.0	Sundry Goods/Medical Supplies
12	12	Itochu Shokuhin	Osaka	617,505	-2.0	Grocery
13	13	Vital KSK Holdings	Tokyo	548,012	-2.9	Drugs
14	15	Nihon Shurui Hanbai	Tokyo	503,175	-0.6	Grocery
15	14	Tohan	Tokyo	495,132	-2.6	Books/Audio/Video/Music Instruments
16	16	Forest Holdings	Oita	417,017	-2.6	Drugs
17	17	Asahi Shokuhin	Kochi	387,887	0.1	Grocery
18	18	YAMAE HISANO	Fukuoka	349,067	0.9	Grocery
19	19	World	Hyogo	295,511	-4.5	Textile
20	21	Starzen	Tokyo	282,575	10.1	Grocery

The source : The Nikkei Marketing Journal

Table 5.2-3 Top 20 retail companies in Japan (As of 2014)

2014	2013	Company Name	Type of business	Annual sales (¥Million)	Growth (%)
1	1	Aeon	Holding Co.	7,078,577	10.7
2	2	Seven & I Holdings	Holding Co.	6,038,948	7.2
-	-	Aeon Retail	Supermarket	2,117,200	-1.1
3	3	Yamada Denki	Specialty store	1,664,370	-12.1
4	6	Fast Retailing	Holding Co.	1,382,935	21.0
-	-	Ito-Yokado	Supermarket	1,285,942	-2.0
5	4	Isetan Mitsukoshi Holdings	Holding Co.	1,272,130	-3.7
6	5	J. Front Retailing	Holding Co.	1,149,529	0.3
7	-	UNY Group Holdings	Holding Co.	1,018,958	-
8	7	Takashimaya	Department store	912,522	0.9
9	13	H2O Retailing	Holding Co.	844,819	46.5
10	10	Amazon Japan*	Online retailer	840,000	13.5
11	8	Bic Camera	Specialty store	829,833	3.0
-	-	Sogo•Seibu	Department store	802,996	0.2
-	-	UNY	Supermarket	745,647	-3.3
-	-	7-11 Japan	Convenience Store	736,343	8.4
-	-	UNICLO	Specialty store	715,643	4.7
12	9	edion	Specialty store	691,216	-9.8
-	-	Daimaru Matsuzakaya Department Stores	Department store	671,767	-1.0
-	-	Mitsukoshi Isetan	Department store	656,363	-2.8
13	12	Yodobashil-Camera	Specialty store	651,588	-5.7
14	11	K's Holdings	Specialty store	637,194	-9.1
15	14	Don Quijote Holdings	Holding Co.	612,424	7.7
-	-	Daiei	Supermarket	611,532	-6.1
16	16	Life Corporation	Supermarket	584,984	9.4
17	15	Izumi	Supermarket	579,738	4.1
18	17	SHIMAMURA	Specialty store	512,828	2.0
19	19	Lawson	Convenience Store	497,913	2.6
20	18	Matsumotokiyoshi Holdings	Specialty store	485,512	-2.0

An asterisk (*) indicates a consolidated subsidiary whose parent company is included in the top 500 list.

The source : The Nikkei Marketing Journal

Table 5.2-4 Top 10 convenience store chains in Japan (As of 2014)

2014	2013	Company Name	Location of Head Office	Group	Annual sales (¥Million)	No. of stores
1	1	Seven-Eleven Japan	Tokyo	Seven & I Holdings	4,008,261	17,491
2	2	Lawson	Tokyo	Mitsubishi Corporation	1,961,983	12,276
3	3	Family Mart	Tokyo	Itochu Group	1,860,176	10,514
4	4	Circle K Sankus	Tokyo	UNY Group Holdings	928,201	5,990
5	5	Ministop	Chiba	Aeon	332,085	2,151
6	6	Daily Yamazaki	Tokyo	Independent	192,708	1,533
7	7	Seicomart	Hokkaido	Independent	181,800	1,168
8	8	JR East Retail Net	Tokyo	East Japan Railway Company	100,111	508
9	9	Three F	Kanagawa	Independent	81,614	558
10	10	Poplar	Hiroshima	Independent	73,747	525

The source : The Nikkei Marketing Journal

Table 5.2-5 Sales by type of merchandise in department stores

(As of 2015)

Type of Merchandise	Total sales (¥Million)	%
Total sales	6,174,279	100.0%
Apparel	2,017,092	32.7%
Accessories	811,230	13.1%
Household goods	288,823	4.7%
Grocery	1,701,688	27.6%
Restaurant	172,134	2.8%
Sundry goods	1,000,170	16.2%
Service	65,878	1.1%
Others	119,263	1.9%
(Shopping gift cards)*	-175,422	—

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

Table 5.2-6 Sales by type of merchandise in chain stores

(As of 2015)

Type of Merchandise	Total sales (¥Million)	%
Total sales	1,316,829	100.0%
Grocery	846,677	64.3%
Apparel	119,196	9.1%
Sundry goods	109,090	8.3%
Drugs & Cosmetics	41,038	3.1%
Furniture & Homefurnishing	59,229	4.5%
Home electrical apparatus	14,012	1.1%
Other living goods	45,359	3.4%
Service	3,977	0.3%
Others	78,247	5.9%

The source : Japan Chain Stores Association
(58 member companies and 9,384stores)

Table 5.2-7 The growth of e-commerce market in Japan

(As of 2014)

Type of Merchandise		2011		2012		2013		
		Scale (¥Billion)	EC ratio	Scale (¥Billion)	EC ratio	Scale (¥Billion)	y/y	EC ratio
Retail	GMS	1,782	4.74%	1,891	5.05%	2,200	116.4%	6.39%
	Apparel & Accessories	144	1.12%	175	1.33%	220	125.8%	1.65%
	Grocery	532	0.85%	605	0.96%	706	116.7%	1.08%
	Automobile, Automobile Parts	1,246	4.08%	1,426	4.29%	1,648	115.6%	4.84%
	Furniture, Household goods							
	Electrical products							
	Drugs & Cosmetics	420	3.64%	501	4.02%	603	120.4%	4.56%
	Sporting goods, Books, Music, Toys	367	2.46%	400	2.74%	467	116.6%	3.26%
Service	Tourism	1,270	5.47%	1,496	6.16%	1,826	122.1%	7.38%
	Restaurants							
	Entertainment	131	0.89%	147	0.94%	166	112.9%	1.19%
Construction		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturing		119	N/A	116	N/A	115	99.3%	N/A
ICT		2,032	N/A	2,295	N/A	2,697	117.5%	N/A
Transport & Logistics		264	N/A	307	N/A	363	118.0%	N/A
Financial Services		72	N/A	68	N/A	69	100.7%	N/A
Wholesalers		80	N/A	86	N/A	86	100.1%	N/A
Other								
Total		8,459	N/A	9,513	N/A	11,166	117.4%	N/A
Total (Retail and Service)		5,892	2.83%	6,641	3.11%	7,836	118.0%	3.67%

The source : METI (Ministry of Economy, Trade and Industry) FY 2013 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 5.2-8 Top 20 e-commerce (B2C) players in Japan (As of 2014)

	Company Name (Website)	Annual sales (¥Million)	Annual Growth (%)	EC ratio	Line of goods	Account Closing Month
1	Amazon Japan (amazon.co.jp)	837,900	12.3	100%	General	Dec
2	Senshukai (bellemaison.jp)	83,121	0.0	68%	General	Dec
3	Yodobashil-Camera (yodobashi.com)	80,000	24.1	100%	Home electrical apparatus	Mar
4	Nissen (nissen.co.jp)	61,700	-2.8	58%	General	Dec
5	Dinos Cecile (dinos.co.jp)	57,069	-6.1	52%	General	Mar
6	Dell (dell.co.jp)*	55,000	-	100%	PC	Jan
7	Joshin Denki (joshinweb.jp)*	50,000	-	100%	Home electrical apparatus	Mar
8	Ito-Yokado (www.itoyokado.co.jp)	50,000	11.1	100%	Grocery	Feb
9	Kitamura (kitamura.co.jp)	43,034	-1.1	100%	PC	Mar
10	Start Today (zozo.jp)	41,182	6.7	100%	Apparel	Mar
11	Japanet Takata (japanet.co.jp)*	38,000	-	25%	Home electrical apparatus	Dec
12	Bic Camera (biccamera.com)	35,000	33.1	100%	Home electrical apparatus	Aug
13	Seven & i Net Media (www.7netshopping.jp)*	33,643	-	100%	General	Feb
14	QVC Japan (qvc.jp)*	28,800	-	30%	General	Dec
15	MouseComputer (mouse-jp.co.jp)	28,360	1.6	100%	Apparel/Accessories	Mar
16	Jupiter Shop Channel (shopch.jp)*	28,000	-	20%	General	Mar
17	MOA (a-price.co.jp)	27,900	31.0	100%	Home electrical apparatus	May
18	Fast Retailing (fastretailing.com)	25,547	5.4	100%	Home electrical apparatus	Aug
19	DHC (www.dhc.co.jp)*	24,200	-	52%	Cosmetics/Health Foods	Jul
20	PureCreate (pure-create.com)	23,000	9.5	100%	General	Jul

The source : Koubunshuppan

(*:estimate)

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