GS1 Japan

GS1 Japan Handbook 2010-2011

Message from the President

On July 1, 2010, I was appointed as the President of GS1 Japan. Since I had worked as its CEO from June 1993 to January 2001, this is a comeback for me after an interval of about a decade.

During this decade, GS1 Standards expanded greatly. GS1 has made great advancement as seen in the development of activities for global networks and databases using information and communication technologies. I am very happy to know this and would like to express my heartfelt appreciation to everyone whose efforts are supporting GS1 activities all over the world.

Adoption of GS1 Standards has been steadily increasing in Japan, too. The number of companies that have registered their company prefix has reached 120,000. Because GTIN is now also used for merchandise sold on the Internet, the number of registrations continues to increase, even today, 32 years after the registration was started in 1978. For products other than groceries, the use of GTIN has recently been increasing in the healthcare industry. For EPC, some apparel and industrial gas companies have adopted this code. For the EDI, we are working to establish and gain wider adoption of the local EDI Standards (Ryutsu BMS) in an XML format that would support domestic businesses in Japan.

High-end mobile phones are widely used by people of all ages in Japan. Their applications for sales promotion, payment, order placement and other tasks are also being put to practical use in both B2B and B2C transactions. The possibility of the service combining mobile communication with GS1 Standards has become an issue to be addressed promptly, too.

GS1 Japan will continue making further efforts to increase the adoption of GS1 Standards. At the same time, we will emphasize activities that reflect local needs on the international standards with a view to providing other countries with useful information on the needs of supply chains in Japan and Japanese consumers.

Finally, I sincerely hope the further development of GS1 Member Organisation, GS1 Global Office and user companies, and I look forward to GS1 Standards contributing to customer satisfaction.

井上 敦

Takeshi Inoue
President
GS1 Japan

GS1 Japan Handbook 2010 – 2011
Contents

1. BarCodes & Identification

1.1 GTIN

1.1.1 Allocation of GS1 Company Prefix

When Japan became a member of EAN Association (now GS1) in 1978, we acquired country code (GS1 Prefix) 49 and began allocating 7-digit company prefixes to member companies. Since then, with the increase in number of member companies, an additional country code, 45, was acquired. In January 2001, we began allocating 9-digit company prefix to companies that had less than 50,000 product items at the time of application, while allocating conventional 7-digit company prefixes to companies that had 50,000 or more items. GS1 company prefix are allocated to 119,647 companies as of March 2010. These registered companies include manufacturers of consumer products such as foods, sundry goods, apparel and textiles, and domestic electrical appliances, as well as utility companies engaged in supplying electricity, gas, water, and telecommunication services (see 1.4) and companies/ individuals who sell their products online (see 1.1.3).
Registration of the company prefix needs to be renewed every three years.

1.1.2 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.

Fig. 1.1.2-1 GEPIR Search Result Example Screen

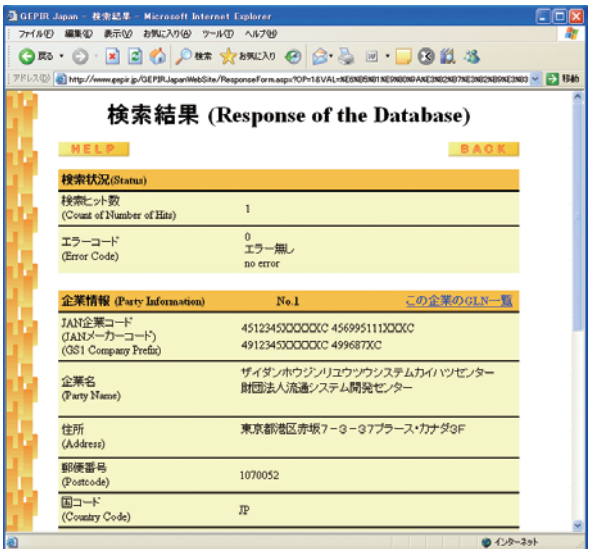
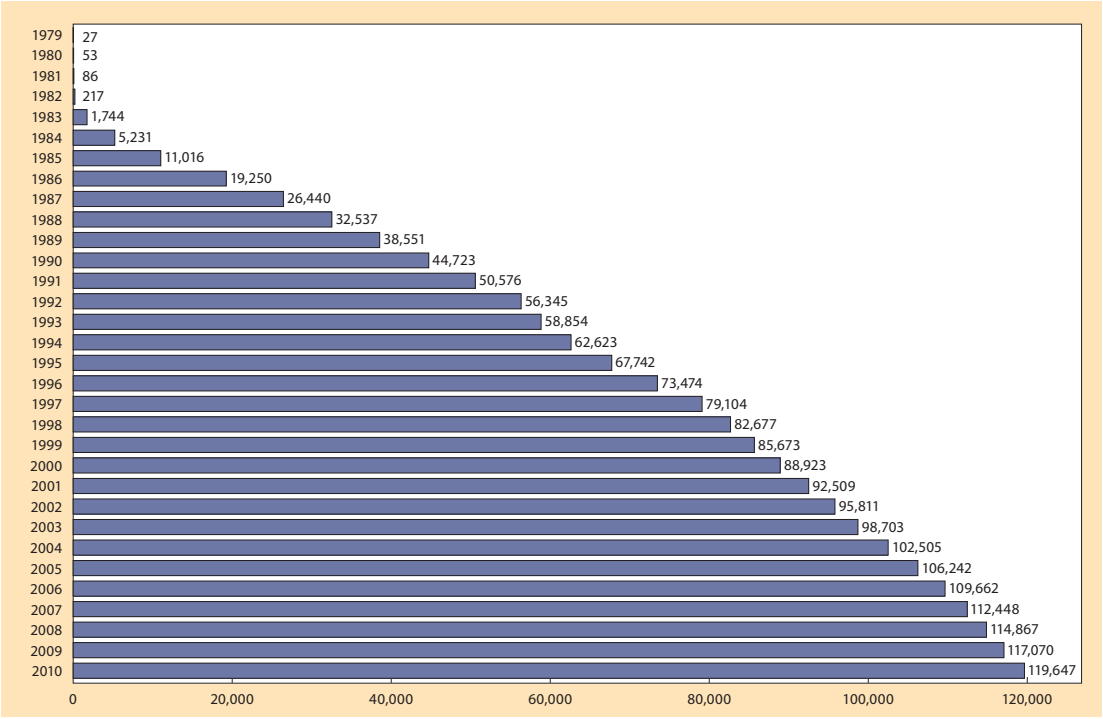


Fig. 1.1.1-1 Company Prefix allocation



1.1.3 GTIN application to online sales

GTIN is being used not only for products sold in brick-and-mortar stores but also for those sold on the Internet, including both physical products and downloadable digital products.

1.1.3.1 GTIN in Online Music Service

In 2005, a new service that uses the Internet to sell music content was launched in Japan. The system called iTunes Store is run by a wholly-owned subsidiary of Apple Inc.

Since all songs must be controlled globally and digital songs must be synchronized with hard copy products of the same content, iTunes Store manages sales units (both individual songs and albums) by GTIN. Therefore, the GS1 company prefix is mandatory for registration of songs at iTunes Store.

The allocation of GTIN for digital songs should be proceeded as follows:

When the music content sold in both iTunes Store and CD/DVD are exactly same, GTIN should also be the same. When they have different content (when a promotional video is added for example), a different GTIN should be allocated.

It is certain that the music industry is becoming a great user of GTIN in Japan. Observation of newly registered GS1 Company Prefix by industry thus far shows that the registration of music categories began to increase gradually in 2004 and has ranked second after food since 2006. But music products include both physical products such as CDs, records and music tapes, as well as downloadable digital products. In Japan, nearly 30 companies, including Yahoo! Japan and Sony Music Entertainment (Japan) Inc., provide music distribution services for personal computers and portable players, and several firms also provide this service for cellular phones. It is expected that online music distribution will continue to spread in Japan in the years ahead.

At present, Apple Inc. is the only confirmed user of GTIN for music distribution. GS1 Japan will continue to monitor the potential of GTIN use in this field.

1.1.3.2 Use of GTIN by Amazon. co. jp®

An increasing number of Internet retailers are using GTIN. The following explains some examples and the potential for further promoting GTIN.

GTIN used in the "Amazon Advantage Program"

In Japan, the Advantage Program started in June 2006 for books, videos, DVDs, music CDs, software and videogames. The Advantage Program is also available in the United States, the United Kingdom, France, and Germany.

As an Advantage Program user, GS1 Japan has been selling some of its GS1 standard publications since 2007.

Amazon. co. jp® uses GTIN in its "Advantage Program". The Advantage Program is available to small businesses including sole-proprietorships. The program can be used by small publishers and businesses who find it difficult to sell their books, CDs, or music through conventional brick-and-mortar stores.

To participate in the program a vendor needs the following:

★ Sales rights for any items to be sold
★ A valid ISBN or GTIN for each item
★ A barcode on each item mapped to the valid ISBN or GTIN
★ Access to email and the Internet
☆ A legal address in Japan
☆ A bank account in Japan
☆ Be at least twenty years old and residing in Japan or a business located in Japan

(Note: ★Requirements common to all countries, ☆Registrants to Japan only)

Fig. 1.1.3.1-1 GTIN Allocation Procedure

1. GS1 Japan allocates GS1 Company Prefix to musicians.

2. Musicians allocate GTIN -13 to each song and apply to iTunes Store for registeration with GTIN-13.

3. iTunes Store manages their database in 14-digit capacity.

Amazon allocates its own Amazon Standard Item Number (ASIN), in addition to an ISBN or GTIN, and uses these numbers for merchandise management. ASIN is used because the same product is sometimes sold by different vendors. This allows items with different ISBN or GTIN to be managed as the same product on the Amazon website.
ASIN is mapped to ISBN and GTIN in the Amazon.co.jp® product master data, and GTIN is used for product inspections at the fulfillment center or other distribution sites. It is therefore a prerequisite in "Amazon Advantage Program" to have ISBN or GTIN barcodes source-marked on all items.

Increasing registration of GS1 Company Prefix

For the reasons described above, an increasing number of businesses using the "Amazon Advantage Program" are applying to GS1 Japan to register their company prefixes. In the period from FY 2006 to March 2010, many new registrants of the GS1 Company Prefix always cited Amazon as their main partner. The Amazon site posts information on GS1 Japan as the contact for GTIN application. GS1 Japan continues to have close contact with Amazon.co.jp as required.
Merchandise sold on Internet shopping sites fall into two groups: (1) items sold both online and at brick-and-mortar stores and (2) items sold only online. GTIN previously had no role to play in online-only sales, but Amazon's example is significant from the perspective of expanding GTIN's potential.
GS1 Japan is a user of "Advantage Program."
Some GS1 Japan publications are sold at Amazon.co.jp®

Search function using GTIN and cell phones

Amazon introduced a new service called "Amazon Scan Search" in 2004. This service enables users to scan GTIN or ISBN barcodes from product packages using their cell phones, which in turn enables them to directly access the Amazon.co.jp® page for the respective product. When customers are interested in a product, they can search for information on it right from their cell phone and place an order right away.
Because cell phones with cameras are very popular in Japan, consumers will find it easier to shop on the Internet using this service. This is expected to promote the further spread of GTIN in the area of mobile commerce.

Fig. 1.1.3.2-1 GS1 Japan Publications available at Amazon. co. jp®

Fig. 1.1.3.2-2 Scanning GTIN or ISBN using cell phones with camera

1.1.4 GTIN Sunrise 2010 : "Adoption of GTIN"

In the past, most companies in Japan had adopted the 16-digit product codes for outer cases approved by the EAN International for domestic-only distribution. Upon global strategy of using GTIN, GS1 Japan decided to strictly observe the GTIN allocation rules and introduce the 14-digit product codes for distribution by the GTIN Sunrise 2010 program. The following were the three main goals to be attained:

(1) Migrate from 16-digit local case code to 14-digit global standards.
(2) For some types of products, an EAN symbol for the consumer unit contained in the case had been shown on their outer case. In this case, use 14-digit ITF.
(3) Some companies had used the same GTIN for products of decreased quantity (e.g., from 100 g to 85 g). In this case, ask the companies to use different GTINs for different product quantities.

Preparing to adopt GTIN, GS1 Japan created a consultative committee for identifying problems relating to the introduction and for discussing measures to cope with these problems to ensure smooth and efficient GTIN adoption. The committee was composed of

members representing various stakeholders in the supply chain, i.e., manufacturers, wholesalers and retailers. After examining and having adequate discussions about the state of distribution in Japan, the committee drew up the "Guidelines for the Adoption of the GTIN" and the "Schedule for the Introduction of the GTIN". In March 2005, GS1 Japan published these guidelines and schedule and started full-scale efforts to introduce the GTIN.

With the cooperation of various stakeholders in the supply chain, information about adopting the GTIN was provided through briefings held for the member companies of distribution-related associations and organizations, and through various media. In addition, questionnaire surveys on the state of the adoption of the GTIN were conducted for individual companies, too, to provide them with related information and publicize and encourage wider adoption of the GTIN among them.

As a result, the term "GTIN" came to be widely known in Japan's retail industry.

In March 2007, a campaign was started aimed at encouraging companies to observe the allocation rules closely, and individual businesses took steps to follow the rules.

Regarding changing the 16-digit product codes for outer case to the 14-digit codes, which was a unique issue associated with the GTIN's introduction in Japan, the deadline was established to complete the migration by the end of March 2010. Public relations activities for the change were carried out, including, direct notices from GS1 Japan to the manufacturers of the products for which the GS1 Company Prefix was assigned well as campaign materials from wholesalers.

At present, awareness of the 14-digit product codes for grouping of trade items has grown greatly in the distribution industry. With the exception of certain products with slow turnovers for which there remain some cardboard cases on which 16-digit ITF is printed, change to the 14-digit codes has generally been going well.

1.2 Other Identification Numbers

1.2.1 Periodical Publications and Books

Japanese numbering structure for periodical publications (magazines, newspapers, etc) and books is structured as follows:

The numbering structure for periodical publications (magazines) is made up of 13-digit code and add-on code. The former is made up of: 3-digit journal prefix number "491"; 1-digit spare code "0"; 5-digit magazine code; 2-digit volume number; 1-digit publication year; and 1-digit check digit, whereas the latter is made up of 1-digit spare code "0", and 4-digit price.

This code structure was introduced in June 2004. Today, most weekly and monthly magazines issued in Japan are marked with this structure. GS1 Japan cooperates with the Japan Magazine Publishers' Association in registration and management of the code.

For books, we use two EAN-13 symbols to encode necessary data. The first one is ISBN, made up of 3-digit ISBN prefix element "978"; 9-digit consist of 3 elements : Registration group element, Registrant element, and Publication element; and 1-digit check digit. The second one is made up of: 3-digit prefix "192" for the 2nd bar code unique for Japan; 4-digit book classification code; 5-digit price; and 1-digit check digit. GS1 Japan works together with Japan ISBN Agency in registration and management of the number.

Fig. 1.2.1-1 Code Structure for Periodical Publications (magazines, newspapers, etc)

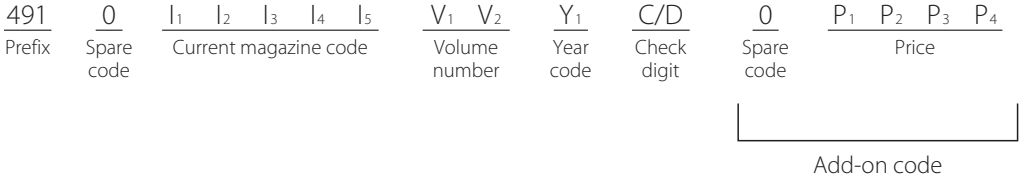
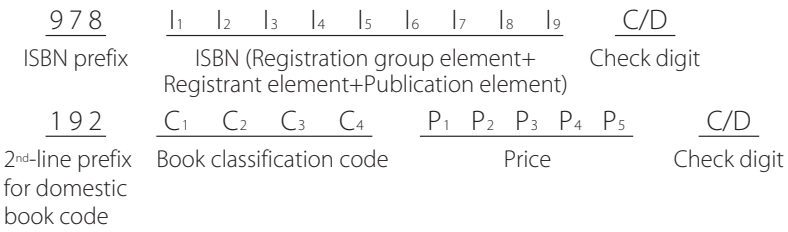


Fig. 1.2.1-2 Code Structure for Books

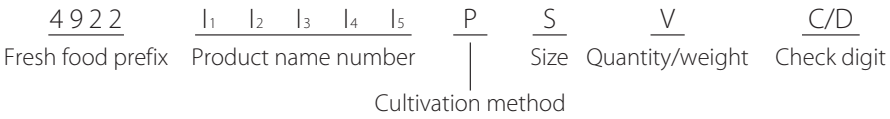


1.2.2 Coding for Fresh Food

In Japan, many agricultural cooperatives (approx. 800) get GS1 Company Prefix and allocate GTIN-13 to their products. In addition, the following coding system unique to fresh foods was developed under the government initiative with GS1 Japan's collaboration. The code structure is intended for application by shippers or in supply chain including use in retail in-store marking and ordering systems. ↗

The code is made up of: a 4-digit fresh food prefix number, "4922"; 5-digit domestic fresh food standard article code (product name number); 1-digit cultivation method classification for identifying organic farm products or hothouses, etc.; 1-digit size classification for identifying size, e.g., S, M, L; a 1-digit weight/sales unit classification for identifying sales unit, e.g., case, or volume/weight such as 100g or the number of units contained in a package; and a 1-digit check digit.

Fig. 1.2.2-1 Fresh Food identification code structure



1.3 GLN

GS1 Japan has been promoting the use of GLN as a location code in B-to-B commerce. In Japan, there are currently four GLN numbering structures as shown in the table below. Companies assigned a 7- or 9-digit GS1 Company Prefix for product identification are able to generate GLNs using this prefix. GS1 Japan also allocates a 10- or 11-digit Company Prefix upon request.

In addition, GS1 Japan provides information about GS1 Company Prefix holders via GEPIR. To further promote and encourage the wider use of GLN, we will also operate the GLN database system on our GEPIR website for registering and searching for individual location information. ↗

At present GLN is being used to identify companies and places of business mainly in the e-marketplaces of department stores and in the EDI between the Japanese Consumers' Co-operative Union and its suppliers. In addition, we have recommended the use of GLN to the companies adopting the Ryutsu BMS, new EDI standard (See 2 for details).

To promote the wider use of the Ryutsu BMS, GS1 Japan is conducting a campaign that waives the registration fee for new registrations until the end of March 2011.

Table 1.3-1 GLN Numbering Structure in Japan

1	2	3	4	5	6	7	8	9	10	11	12	13	Capacity	Company Prefix
M1	M2	M3	M4	M5	M6	M7	L1	L2	L3	L4	L5	C	100,000	applicable for both GTIN/ GLN
M1	M2	M3	M4	M5	M6	M7	M8	M9	L1	L2	L3	C	1,000	
M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	L1	L2	C	100	exclusive for GLN
M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	L1	C	10	

M = GS1 Japan assigned Company Prefix L = Location Reference assigned by Company Prefix holder C = Check Digit

1.4 Billing System Using GS1-128

A public utility charge collection service was initiated by Seven-Eleven Japan Co., Ltd. and Tokyo Electric Power Company in October 1987, after GS1 Japan at the time established a code system using EAN-13 symbols in the same year.

Subsequently, most of the Japanese convenience store chains have joined and the system has been expanded to include gas bills, telephone bills, insurance fees, broadcasting fees, water bills, credit bills, mail-order bills, national pension premiums, and various tax bills. The number of bill issuers has reached a figure of 8,000 (including the service sector and public bodies), the number of convenience stores offering the service system is about 30 (40,000 stores), and the total collected amount exceeds 8 trillion yen (US$ 7.3 billion) / year in 2008. In 2010, total amount collected by processing this bill at Japan's three largest convenience store chains (Seven-Eleven Japan, Lawson, and FamilyMart) exceeded their turnover from merchandise sales, and the resultant increase in customer visits to the stores also contributed to greater sales.The initial system used 3 or 4 EAN-13 barcodes to encode the necessary information. To enable operation ease and efficiency, new system using single GS1-128 barcode was introduced in May 2001.

Fig. 1.4-1 Sample Payment Slip

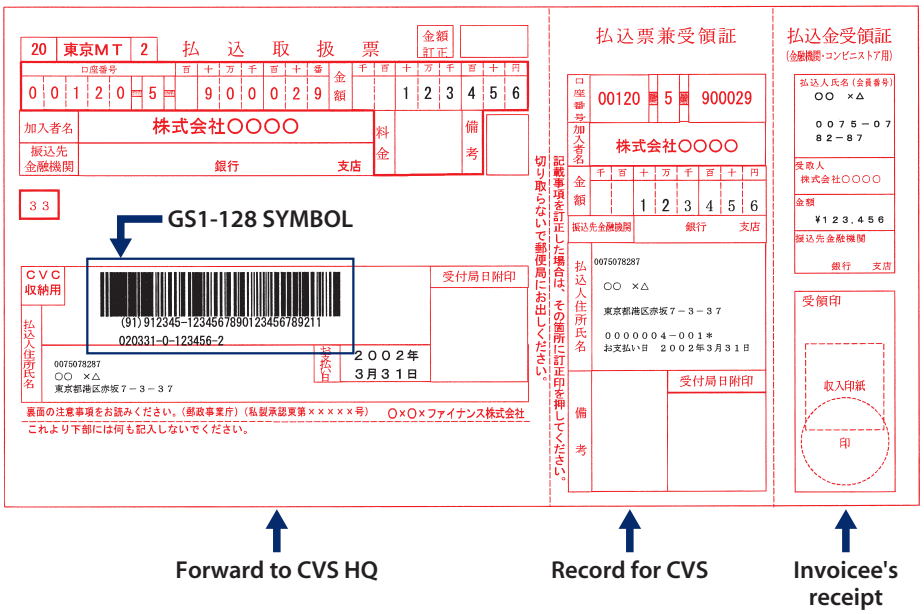


Fig. 1.4-2 Code Structure (44 digits) for Payment Slip

(91)	MMMMMM	EEEEEEEEEEEEEEEEEEEEE	R	YYMMDD	F	PPPPPP	T
①	②	③	④	⑤	⑥	⑦	⑧

	Data item	Content	Number of Digits
①	(91)	AI (for data item)	2
②	MMMMMM	Second digit of company prefix (9 or 5) + company prefix (five digits)	6
③	E...E (21digits)	free use	21
④	R	Re-issue (times of re-issuance)	1
⑤	YYMMDD	Payment Due date	6
⑥	F	Postal tax indicator flag (0=not required, 1=necessary)	1
⑦	PPPPPP	Amount due (in Yen)	6
⑧	T	Check digit (modulus 10)	1

1.5 GS1 DataBar

Since the 2006 GS1 DataBar Adoption Plan Announcement, GS1 Japan has been promoting GS1 DataBar in the Japanese market. This symbol attracts attention because of its capability to carry additional data other than product identification. However, there is still much to be done for nation-wide readiness because of various challenges.

To demonstrate business cases for GS1 DataBar applications, two pilot programs using additional information on short-shelf-life products were successfully conducted in 2008 and 2009. In late 2009, GS1 Japan and the GS1 DataBar taskforce tested direct-printing of GS1 DataBar Expanded on moving plastic films upon requests from the user community, to explore the technical possibility. GS1 Japan will continue to promote the advantages of the symbol and encourage users to replace their equipment. Also, we will explore and discuss various possibilities of the application of the symbol that could trigger implementation of GS1 DataBar in Japan.

1.5.1 Expectations and Challenges in Japan

GS1 DataBar is perceived as a "future barcode" that will help improve product management especially in the food chain business. Many Japanese retailers have expressed their expectations on packages carrying best-before-dates or lot numbers on processed food, not only on perishable fresh food. The ability of GS1 DataBar to carry additional data other than GTIN is receiving much attention.

On the other hand, the symbol's potential to enable unique global identification of products such as fresh produce or variable measure fresh food is not appreciated as much in Japan as in other regions. The fresh food supply chain and its business practices in Japan are complex, and this poses an obstacle to immediate migration from the restricted circulation number (RCN) to GTIN for fresh produce. The large number of small growers and Japan's public market auction system for fresh produce and seafood make source-identification seem less valuable or a less pressing issue. Producers know that not all retailers will read GS1 DataBar to retrieve a GTIN even if they mark their products with the symbol. Retailers are not very eager to collect dozens of different GTINs for every produce category as this will entail much database maintenance.

The readiness and replacement speed of those on the accepting side is another challenge. The large number of small and medium retailers and wholesalers makes education or promotion a higher task. Even after such businesses are won over, smaller concerns tend to use their equipment longer and do not rush to replace it.

Another factor influencing the slower replacement is that there are several alternatives for handling additional data at point-of-sale when limited to in-store environments. Some relatively larger retailers use Code-128 or two EAN-13 barcodes made to work at omnidirectional, fixed POS scanners to process additional data such as price mark-downs or sell-by-dates. (See Fig. 1.5.1-2 for example.) As long as retailers are satisfied with handling additional data in a closed environment, there is little incentive to use GS1 DataBar which will require new investment. Because these data carriers are used for limited data length (usually 22 to 26 digits) and exclusively in-store, GS1 Japan is promoting that the importance and benefit of GS1 DataBar lies in standardized data strings and its possibility for expanded data as well as use in open supply chains.

Fig. 1.5.1-1 GS1 DataBar Brochure

Fig. 1.5.1-2 Use of Code-128 carrying mark down info. for retail POS

Fig. 1.5.2-1 Finding better placement of GS1 DataBar on a Sashimi tray

1.5.2 Retailer pilots and technical research

Two retailers conducted in-store operations using GS1 DataBar Expanded in 2008 and 2009. Both pilots were focused on the use of additional data such as sell-by-date or sell-by-hour and mark-down information for items that have relatively short shelf-lives (sushi, sashimi, meat, and delicatessen foods), and Japanese beef using source entity identification numbers. When the shelf lives of these products neared expiration, mark-down information in a new GS1 DataBar Expanded was added. The retailers built an application in which the POS terminal gives a warning when an expired product is presented. Both pilots were successful with a lot of findings for store-operations including how to place GS1 DataBar on trays or curved surfaces (Fig. 1.5.2-1).

In late 2009, GS1 Japan and the GS1 DataBar taskforce conducted printing and reading tests of GS1 DataBar Expanded to explore its current technical possibilities. The tests focused on GS1 DataBar Expanded Stacked with semi-variable data such as an Expiration date, AI (17), and lot number, AI (10), printed on a plastic film surface moving at different speeds (Fig. 1.5.2-2). Both thermal-transfer printing and inkjet printing were tested. In addition, dynamic printing was tested using a mock-up vertical packaging line. This test was requested by users who wanted to see the potential use of the symbol on processed foods. It is possible to directly print GS1 DataBar at certain speeds in such lines. However, printing in package lines requires careful planning and further tests for actual user requirements and environments. The optimal line speed, package material or substrate, and package line configuration and the choice of printing techniques must be selected and specified because these are the parameters that affect the printed symbol grade.

Fig. 1.5.2-2 GS1 DataBar Expanded test print with AI (01), (17) and (10)

1.5.3 Helping Implementation and driving broader awareness

In 2010, GS1 Japan and the GS1 DataBar taskforce are working on compiling a hands-on implementation guideline for the symbol. Our goal is to provide comprehensive and easy-to-understand material on what GS1 DataBar is, and where and how retailers can start using the symbol. We plan to compile the findings from pilot programs and technical tests from the last three years as useful tips. We intend to continue updating the GS1 DataBar brochures and circulate them widely.

We will continue to work with key industry leaders and associations to further promote the adoption of the symbol. We will use many avenues to reach as many retailers as possible, taking advantage of business and trade shows as well as solution providers' networks.

1.6 QR Code

QR Code is pervasively used in Japan. It is regarded as the "Mobile barcode" because of the wide use in mobile application. It is also associated with traceability because of various use cases.

1.6.1 QR Code introduction

QR Codes are widely used in Japan and throughout Asia. It was invented in 1994 by Denso (now Denso Wave), one of Toyota Motor Corporation's group companies. It was approved as an ISO international standard symbol (ISO/IEC 18004) in June 2000. This two-dimensional symbol was initially created for improving production control procedure of automotive parts. After the specification was made publicly available, QR Code became very well-known and widely used. In fact, it is considered to be "the 2D Symbol" in Japan.

Today's widespread use of QR Codes is due to the incorporation of a decoder for QR Codes in mobile phones with cameras in the early days of mobile communication. The most popular use of QR Code in Japan is to encode URL of a mobile website. More than 90% mobile phones in Japan feature a camera with software that can read and decode information contained in a QR Code, which has literally made the symbol ubiquitous in Japanese daily life. Now it is almost the norm for mobile phones to also have software that generates QR Codes for any given data. QR Codes are not only visible everywhere and every day in Japan, but they are also scanned (and sometimes generated) by consumers. (see 4.3 for Mobile Solutions).

The use of QR Codes in the mobile industry is not limited to carrying mobile URLs. QR Codes also carry a variety of data including information on tickets, payments, and coupons. Such uses are rapidly increasing. Japan's major airline carriers are using QR Codes for encoding boarding ticket information. Some railway companies and many on-line ticket service providers are using QR Codes for tickets and admission tokens. There are retailers and food service companies who encode mobile coupon data in QR Codes. In such cases the QR Codes are either printed on paper or displayed on a customer's mobile phone screen are read with image readers. The use of QR Codes will only increase in the future steadily, if not phenomenally.

Another important use of QR Codes is for traceability in food and other product supply chains. An increasing number of upstream suppliers of processed food use QR Codes by encoding GS1 Data defined by Application Identifier standards (see 1.5.2 and 4.2). Government organizations recommending traceability acknowledge the QR Code as an optional data carrier for implementing a traceability system. QR Codes are typically used in labels too small to carry GS1-128. The industry guideline for surgical steel instruments allows QR Code as a standard symbol together with GS1 DataMatrix to carry GTIN and serial number.

The GS1 General Assembly in May 2010 stated that QR Code will be considered as an equal choice for 2D symbols in B2C transactions or any new applications using 2D.

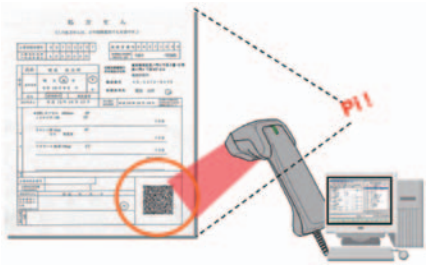
Fig. 1.6-1 QR Code on a Retailer's Private Brand banana and National Brand Potato Chips package

Fig. 1.6-2 QR Code for train ticket combined with mobile phone

1.6.2 Various Applications of QR Code

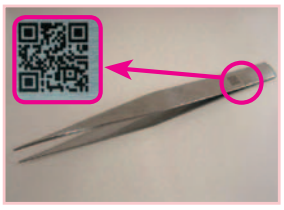
The QR Code presently finds a wide range of applications in various industries.

(1) Prescription for dispensing pharmacies



A new service has started in which prescription data is encoded into QR Codes and printed on prescriptions. The specifications for recording the data are standardized by the Japanese Association of Healthcare Information System Industry (JAHIS). In this service, users read prescription data with a scanner, which enters patient and prescription data quickly and accurately into the computer, preventing input errors and alterations of prescriptions. Because the service reduces time required for data input, waiting time becomes shorter for patients while pharmacists can spend longer time giving instructions on dosage and administration. Data to be encoded include information on the medical institution, diagnosis and treatment department, physician's name, patient's name, health insurance information, and drug information. Coded information complies with the data exchange standard of HL7 with which GS1 concludes a Memorandum of Understanding for collaboration.

(2) Standardization at the Japan Association of Medical Equipment Industries



GTIN and serial numbers are coded into QR Code and directly marked on steel surgical instruments. (For more details, see 4.1.2.3)

(3) Test System for Blood Specimens

Medical laboratories analyze and test medical specimens such as blood as commissioned by medical institutions. These specimens must be accurately managed and identified individually because a great number of specimens are handled every day for individual hospitals, test types, and test times.
At some laboratories QR code labels are automatically printed marked and attached by labeling equipment. Data include acceptance date, medical institution name (in Chinese characters), analysis/test item code, test site code, and identification number.

(4) Sales Management of Glasses and Contact Lenses

QR Codes are used for the sales management of contact lenses and glasses. For a contact lens, the product code, product name, degree of correction, base curve, and other information are encoded into a QR Code of about 8 square mm size. The code is printed on the lens container, and the information is used for point-of-sales or inventory management.

(5) Visitor Management System

At various exhibitions, seminars, and receptions QR codes on the ID badges of visitors and/or event staff are scanned when they enter and exit the venue, and used for various purposes such as on-site security management, marketing management, and customer management. For example, QR code was used in the Expo 2005 Aichi Japan for the staff/vehicle entry control.

2. eCom (EDI)

2.1 History and Current Status of EDI in Japan

EDI in the retail industry in Japan started with the Electric Ordering System (EOS) using JCA Protocol (*1), the standard data communication protocol drawn up in 1980 by the Japan Chain Stores Association (JCA). In the 1990s and after, EDI came to be adopted for tasks other than ordering, too, and in the 2000s, based on Efficient Consumer Response (ECR) and Quick Response (QR) procedures, Ryutsu BMS was established for the purpose of achieving sharing of information among companies.

2.1.1 From the JCA Protocol to the Ryutsu BMS

The JCA Protocol was drawn up in 1980, became widespread as an EOS for the retail industry and was designated in 1982 by the Ministry of International Trade and Industry (present Ministry of Economy, Trade and Industry or METI) as the standard communication protocol for the retail industry (J Protocol).
After that, the J Protocol was also adopted by retail industries other than supermarkets as a main tool in the area of EDI. The business procedures covered by EDI expanded from the EOS to shipment, receiving of goods, billing and payment. On the other hand, with the spread of the Internet in 2000 and after, the following issues connected with the J Protocol began surfacing:

- Low speed
- Inability to deal with Kanji characters and images
- Necessary communication equipments were discontinued
- Difficulty in adding new items due to the fixed-length formatting
- Data formats differed from retailer to retailer

Concerned about the situation, the two supermarket organizations cooperated and in June 2005 started investigating a next-generation EDI. Their examinations were performed as part of the project for promoting the optimization of the entire distribution supply chain conducted by METI from FY2003 to FY2005. METI continued to conduct the Supply Chain Information System Standardization Project for three years from FY2006 to FY2008 to support standardization activities for the supermarket industry. As a result, in April 2007, the Ryutsu (*2) Business Message Standards (abbreviated to Ryutsu BMS) was created as a new EDI standard. The Ryutsu BMS is now at the stage of diffusion in the retail industry, including supermarkets.

2.1.2 Outline of the Ryutsu BMS

The Ryutsu BMS defines the following three matters:

2.1.2.1 Communication infrastructure

Assuming that the Internet is used for communication, the Ryutsu BMS designates the following three standard protocols for communication:

- Two server-to-server protocols: ebMS and AS2
- One client-to-server protocol: JX Protocol (*3)

In addition, guidelines for steps to ensure security, a concern when using the Internet, were prepared, and the use of three certificate authorities that have followed the guidelines has been recommended.

2.1.2.2 Standard Messages

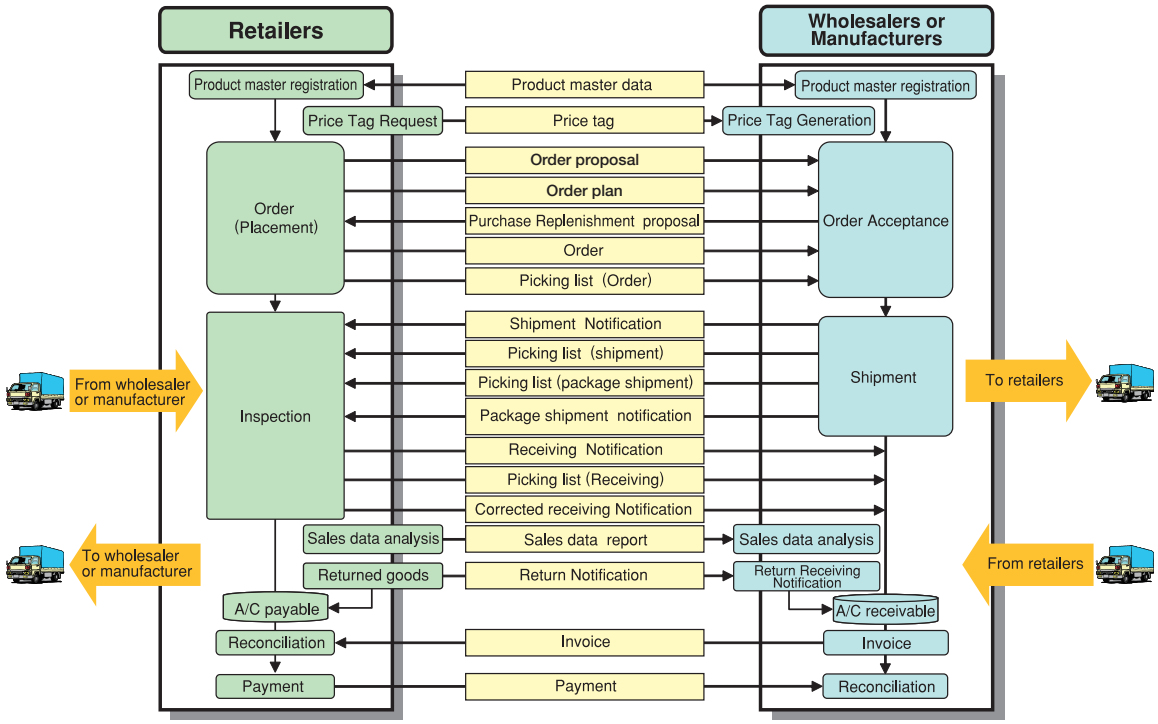
The standard messages are classified roughly into three types and managed for each type of business process models as follows:
Basic messages: Intended for use at supermarkets, drugstores, do-it-yourself (DIY) stores, etc., 19 basic messages were prepared on the basis of an ordering business model, which starts from order placement by the retailer and continues to the shipment and receipt of the placed order.

*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 cannot transmit Kanji and images. DDX circuits are packet communication services using telephone circuits provided by NTT.

*2 Ryutsu
Ryutsu is Japanese equivalent of supply and demand chain, typically consists of three groups; Manufacturers, Wholesalers and Retailers.

*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 equivalent to those of the J Protocol. The JX Protocol has become a standard communications protocol for exchanging EDI messages between client and server in the Ryutsu BMS.

Fig. 2.1.2.2-1 Business Processes and Ryutsu BMS Messages between Retailers and Suppliers



Department store messages: Japanese department stores have unique transaction models that are different from those of other retailer categories. For example, they register a purchase of merchandise when the merchandise has been actually sold and they need to manage pre-ordered seasonal gifts for the Japanese custom of presenting gifts twice a year, in summer and at the year-end. Therefore department store messages are composed of 27 messages.

Transactions at logistics centers: This is a business model where the wholesaler or the manufacturer keeps a stock of products in advance at the retailer's logistics center as its own stock. 4 messages were prepared to support this business model, for the communication between the operator of the center and the wholesaler or the manufacturer.

2.1.2.3 Delivery Slip

Many companies are working to realize paperless operation and efficient inventory control without manually checking between goods listed on delivery slips and actual goods delivered. Using EDI as a means to increase business efficiency is one option. In an effort to maximize the effect of Ryutsu BMS, GS1 Japan standardized the format of the Shipping Carton Marking (SCM) labels as shown in Fig. 2.1.2.3-1.

Figure 2.1.2.3-1 Standardized Logistics Label

2.1.3 Use and effects of the Ryutsu BMS

According to a survey conducted by GS1 Japan in June 2010, 66 retail companies have already adopted the Ryutsu BMS and 75 companies plan to adopt the standard. Supermarkets registered the largest figures: 47 out of the 66 companies adopting the standard and 42 out of the 75 companies planning to adopt the standard were supermarkets. Department stores came next, followed by drugstores, DIY stores and cooperative stores.

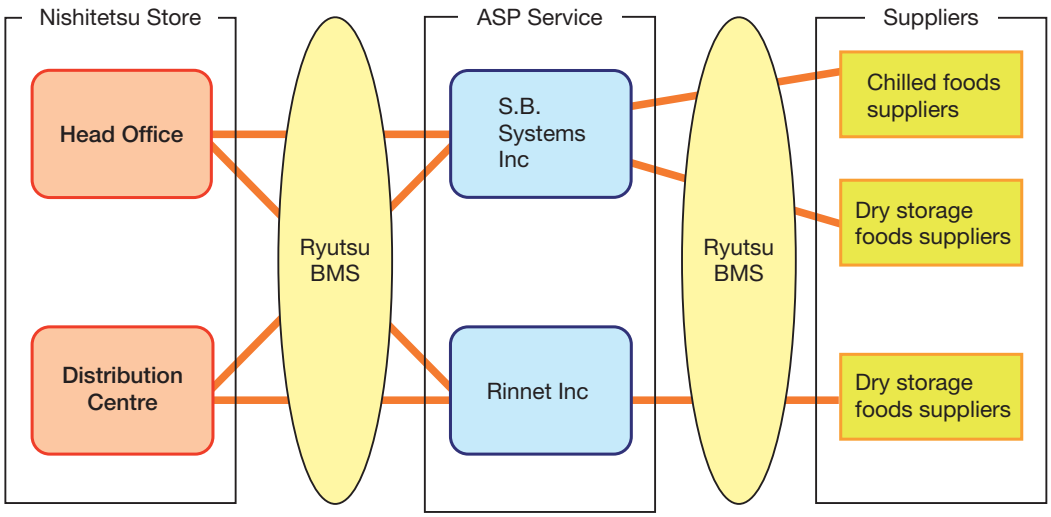
The business categories of the suppliers were various, including processed food, FMCGs, confectionery, apparel, OTC drugs, perishables and DIY goods.

2.1.4 Users' testimonials that have adopted the Ryutsu BMS

2.1.4.1 Nishitetsu Store Inc.

Nishitetsu Store operates 39 food supermarkets in Fukuoka and Saga Prefectures and has annual sales of ¥50 billion. In October 2007, the company adopted the Ryutsu BMS replacing the JCA Protocol it had used up to that time and has attained many good effects since then. As shown in Fig. 2.1.4-1, in the

Fig. 2.1.4.1-1 EDI Network of Nishitetsu Store



company's EDI system, the two ASP businesses are in charge of access according to the type of suppliers: S.B. Systems Inc. is in charge of chilled foods and dry storage foods suppliers and RINNET, dry storage foods suppliers.

Nishitetsu Store mentioned the following as the good effects of EDI adoption:

Time saved by Internet communication

"EDI has produced very good effects in our communication with suppliers, a task that requires an exchange of large amounts of data. Previously for chilled foods, it took total 2 hours to place orders. Our stores used to decide what to order by 11 o'clock and had then spent about one hour sending the data to the head office and it took another hour for suppliers to receive data. This total of 2 hours was reduced to only about 30 minutes as a result of the adoption of the Ryutsu BMS".

Effects of EDI introduction

"The introduction of EDI has enabled us to check the daily receivables and payables, and the task of checking monthly invoices and payments has become far more accurate than the paper-based work of the past. Thus inquiries from suppliers about incorrect amounts and other problems have decreased greatly. In addition, we eliminated various kinds of slips by using receiving notification data as proof of transaction".

2.1.4.2 Seijo Ishii Co., Ltd.

Seijo Ishii is a food supermarket chain specializing in imported foods and high-quality food ingredients and runs 73 stores, mainly in station buildings in the Tokyo Area. In 2007, the company began to increase its pace of new store openings. Then in January 2009 it started to use EDI by the Ryutsu BMS and operate a distribution center in an attempt to reinforce the infrastructure for positively supporting its expansion strategy (See Fig 2.1.4.2-1).

The company's purpose and the effects of its EDI introduction are outlined below:

Purpose of EDI introduction

"Quicker decisions on purchasing and a higher accuracy of stock information were our most important aims of EDI introduction. Because previously we had not received shipment data from suppliers, we were unable to make any real-time purchase decisions and check the inventory of the products at each store. We thought that we must be able to confirm the product stocks at stores to be able to create an automatic ordering system in the future".

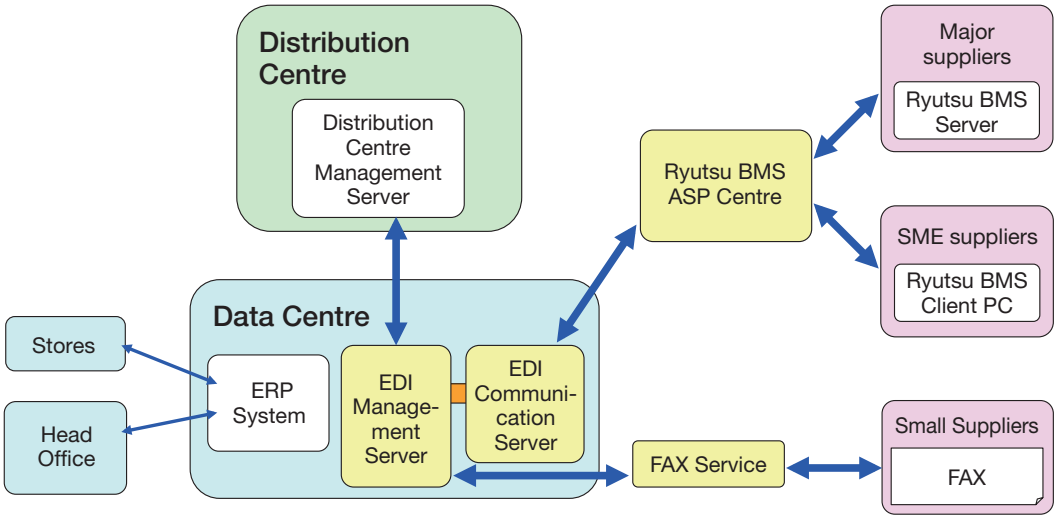
Considerations for small-scale suppliers

"We are highly rated by our customers for products that are not handled by other retailers. This means we have many small but distinguished suppliers, and many of them can receive orders only by fax. Thus we decided to continue to use fax and introduced a system that convert ordering data of the Ryutsu BMS into fax messages. This enabled such small-scale suppliers to keep receiving orders by fax. Each of the purchase orders we send by fax shows the barcode carrying order numbers. By scanning the barcode upon receiving of goods, we can check the delivered goods against the order we placed, thus confirming the proper receipt of the goods. This system allows us to place orders using the Ryutsu BMS with any suppliers regardless of their size".

Effects of EDI introduction

"We have achieved a great effect from eliminating slip-based tasks. We no longer need to check product at the store and to manually enter date on the slip at the accounting department. In addition, because we provide our suppliers with the result of our daily trans-

Fig. 2.1.4.2-1 Seijo Ishii EDI network



actions as data on goods received, we established mutual trust with our suppliers, which led to invoice-less payments.
As a result of quicker communication, we are able to place orders 30 minutes or one hour later than in the past. This is a very important achievement for the order placement department".

2.2 GDS in Japan

Global Data Synchronization (GDS) is the system for international synchronization (simultaneous sharing) of product information.
It is expected that the introduction of a mechanism for master data synchronization into the consumer goods industry in Japan will lead to higher efficiency in the business processes of product manufacturers and wholesalers, who are now providing product master data using formats that differ from supplier to supplier and will also contribute to the progress of e-commerce in supply chains.

2.2.1 Background

In FY 2002, the Database Working group of GCI Japan strove to understand the basic matters of product master information, i.e., Global Trade Item Number (GTIN), Global Location Number (GLN), product classifications and Global Data Dictionary (GDD). In addition, we studied a GDS model for the three-tier distribution structure unique to Japan. To meet complicated and differing business requirements in Japan, the manual registration of product masters had been adopted widely.
An experiment plan was also drawn up on the assumption that the GDS concept would be introduced into the existing industrial product Database and retail exchanges. To demonstrate the experiment plan by combining data, the 24 volunteer member companies of the GCI Study Group in Japan established in FY 2003 the "Manufacturer, Distributor and Retailer Master Synchronization Project" and conducted a pilot in 2003.
In FY 2005 and 2006, pilots were conducted as part of the METI projects. In 2006, to reflect the requirements of business in Japan upon the GS1 Standard, two Change Requests (CR) were presented to and approved by GSMP: CR07-133, Add the value T11 to the Pallet Type code list, and CR07-134, Add Additional Product Classification Code Agency Name. At the end of 2008, pilots ended. Some of retailer and manufacturers are using the Data Model now.

2.2.2 Current Efforts

The future tasks in Japan are to promote and encourage the adoption of GDS by the relevant enterprises. There is also the need for continued reassessment as to the maintenance of standard product masters. Supply Chain Standards Management & Promotion Council (see 6.1 for details) functions as a forum for maintenance.
However, major retailer chains in Japan don't have the need to adopt GDSN yet. They don't need to change the current product catalogue information systems.
GS1 Japan shares standardization's activities and standards with Japanese stakeholders by reporting the progress of the work requests in standards development; including translating Work Requests into Japanese and commenting the background to understand them.

3. EPC/RFID

3.1 EPCglobal Japan

In November 2003, EPCglobal Inc. was established to develop global standards for EPCglobal Network System, a new global initiative that would become a fusion of RFID and Internet technologies. In January 2004, EPCglobal Japan was set up within GS1 Japan.
In close liaison with the GS1 EPCglobal head office, EPCglobal Japan conducts a wide range of activities that include:

- Promoting EPCglobal subscription
- Allocating EPC Manager Numbers and registering them in the ONS central database
- Supports for introduction of EPCglobal Network System
- Regular EPC/RFID Introductory Course including UHF Gen2 demo system for users
- EPC seminars at public spaces
- Supports for EPCglobal Japan subscribers

As of September 1, 2010, EPCglobal Japan has 41 subscribers, of which 35 are end users, 4 are solution providers, and the others are trade associations. Many of the subscribers actively take part in the standardization activities of EPCglobal. In particular, in EPCglobal's Transportation and Logistics Services Industry Action Group and Consumer Electronics Industry Action Group, where standardization activities have been mainly led by the Japanese members, co-chairs of these IAGs have been elected from Japanese subscribers.

3.1.1 Activities of EPCglobal Japan

EPCglobal Japan conducts the following activities:

- Participating in various EPCglobal meetings, such as GS1 Industry and Standards Event
- Holding seminars aimed at promoting the EPCglobal Network System and providing information about the system in various ways, such as the EPC/RFID Introductory Course, EPC RFID FORUM (Conducted by EPCglobal Japan and Auto-ID Labs Japan to promote public acceptance of EPCglobal system) and the EPC seminar at RETAILTECH JAPAN (Asia's largest retail IT and supply chain exhibition since 1985)
- Holding regular meetings with EPCglobal Japan subscribers to provide information about recent activities of EPCglobal which enables subscribers to exchange opinions that can be reflected into EPCglobal activities

3.1.2 Consumer Electronics Industry User Group (CE IUG)

Implementation Guidelines for the Use of EPCglobal Standards in the Consumer Electronics Supply Chain
The Japan RFID Consortium for Consumer Electronics (JRCCE) (*1) has conducted verification tests to study the possibility of using RFID as well as the benefits brought about by using RFID. The expertise and technology gained from these verification tests have been used to draw up the guidelines and have been shared among companies in the consumer electronics industry together with points to note in when implementing EPCglobal Standards.
The members of the JRCCE have joined the Consumer Electronics Industry Action Group (CEIAG) of EPCglobal and have examined the business requirements for the consumer electronics industry in an effort to have the expertise and technology included in the guidelines. They summarized the necessary requirements for managing consumer electronics

Fig 3.1.1-1 EPCglobal Japan User / subscriber outreach

*1 JRCCE
The Japan RFID Consortium for Consumer Electronics was established in October 2005 for the purpose of examining the possibility of using RFID and the benefits of using RFID to the consumer electronics industry.

supply chains and described a Requirements Document for Consumer Electronics. In this document, there are the requirements not to kill tags after POS along with the concept of product lifecycle management. In addition, the JRCCE members described a more detailed implementation process by selecting business use cases for managing consumer electronics supply chains and by applying the EPCglobal standards. By summarizing their findings, they completed the Implementation Guidelines for the Use of EPCglobal Standards in the Consumer Electronics Supply Chain.

The guidelines are the kind of manifesto for consumer electronics. The guidelines compile the requirements for supply chain management and business use cases in the consumer electronics as well as the overview of consumer electronics supply chains management. The guidelines also help readers understand what technologies comprise the GS1 Standards. By using the guidelines, companies can quickly acquire information about visibility of products in the supply chain management and also understand the overall concept of product life cycle management which the consumer electronics industry emphasizes, including for example, how to deal with the disposal and recall of defective products.

Content of the Implementation Guidelines for the Use of EPCglobal Standards in the Consumer Electronics Supply Chain (excerpts)

Industry Background
The Technology
Overview of GS1 Standards
The Data
Implementation Procedure
Implementation
Where to get started in CE Operations
Implementation Challenge
Additional Useful information
Selection a technology
Get Involved
GS1 Member Organization

Foundation of the CE IUG

The tasks of the CEIAG ended after the completion of the Implementation Guidelines for the Use of EPCglobal Standards in the Consumer Electronics Supply Chain. A new standardization process was started with the aim of merging the GS1 and EPCglobal development process. GS1 then decided to examine the new requirements for which both the GS1 and EPCglobal Standards would be adopted by encouraging more stakeholders to take part. For this purpose, GS1's CEIUG began as a new place expanding the implementation expertise using the EPCglobal Standards that had been acquired by the CEIAG, while considering environmental problems and discussing these problems and business needs.

The objective of the CEIUG is to discuss and define the needs of consumer electronics supply chains to help enhance the efficiency of key operations in the industry, improve the visibility of goods as they travel through the supply chain and ensure benefits for all CE supply chain partners by improving customer satisfaction.

Scope of study by the CEIUG

Products covered:

Electronic equipment intended for everyday use, e.g., personal computers, televisions, DVD players, refrigerators, hairdryers, as well as entertainment, communications and office equipment.

Business activities covered:

Total product life cycle: forward logistics (manufacturers, logistics providers, retailers, consumers), reverse logistics (consumers, retailers, service providers) and end-of-life operators.

3.1.3 Transport & Logistics Industry User Group (T&L IUG)

Since its foundation in 2005, the Transportation &

Fig 3.1.3-1 Transport & Logistics Industry User Group

Logistics Services Industry Action Group (TLS IAG) of EPCglobal has had the participation of many Japanese companies. These Japanese businesses have played active and leading roles in this IAG by, for example, conducting a three-year pilot study of global logistics. EPCglobal Japan has supported the IAG's activities, too.

The three-year pilot study of global logistics, conducted with financial assistance from METI (The Ministry of Economy, Trade and Industry), found that not only the UHF Gen 2 passive tags but also active tags would be effective for logistics purposes. The study also revealed that it was possible to identify freight and logistics equipment by RFID and to share that information among stakeholders using EPCIS (EPC Information Service). The standard specifications of GS1 EPCglobal were confirmed to be effective for visualizing supply chains. Efforts have been made to develop standard specifications using the knowledge obtained from the pilot study.

In 2010, the TLS IAG was merged with the GS1 Logistics Forum and newly inaugurated as the Transport & Logistics Industry User Group (T&L IUG). The IUG will continue activities aimed at increasing the use of the GS1 Standard Specifications in the logistics industry.

3.2 RFID Initiatives in Japan

The RFID initiatives in Japan such as the revision of radio regulation for RFID by the Ministry of Internal Affairs and Communications (MIC) and advanced EPC/RFID use case and activities are hereunder introduced.

3.2.1 Revision of UHF Radio Regulation for RFID

The revision of the Radio Act in May 2010 expanded the bandwidth of frequencies available for UHF-band RFID tags. The bandwidth for high-power passive tag systems was expanded into from 952 MHz to 956.4 MHz, and the bandwidth for low-power passive tag systems from 952 MHz to 957.6 MHz. In addition, a new bandwidth for mid-power passive tag systems was established for use (antenna power: 250 mW; bandwidth: 952 to 956.4 MHz). Similarly, the bandwidth for UHF-band active tag systems was also expanded from 950.8 MHz to 957.6 MHz.

The use of the 433 MHz bandwidth was approved for active tag systems only for global logistics purposes.

3.2.2 EPC/RFID Use Cases and Activities

3.2.2.1 Apparel Industry: Item Level Tagging

In February 2010, a new apparel shop called I.T.'S. international opened in Harajuku, one of Tokyo's leading fashion districts. This shop was the first to install an item level UHF RFID system in Japan's apparel industry. From jackets, skirts, belts to socks, every single item in the shop including backroom inventory, has an EPC Gen2 hangtag or product label with encoded Serialized GTIN (SGTIN) data. The intent of this implementation is to achieve a brand concept of "high quality clothes at reasonable prices" by reducing store operating costs and enhancing customer service.

I.T.'S. international, the brand's namesake and owner company, was established by the apparel manufacturer Flandre and other four companies. Flandre had been very interested in RFID implementation and joined one of the METI (The Ministry of Economy, Trade and Industry)-funded RFID pilot projects in 2008, and it also tried some in-house experiments.

Currently, Flandre mainly utilizes RFID for efficient inventory taking and faster checkout at POS. Inventory taking had been very time consuming and it was difficult for shops to make up differences between book inventories and actual inventories. With RFID, stock taking time has been drastically reduced and it is

Fig.3.2.2.1-1 I.T.'S. international Harajuku shop, EPC hangtag/label, and inventory taking in the shop

becoming easier to know the accurate stock status nearly in real-time. In the Harajuku shop, it takes only 3 hours for one staff member to read all of some 18,000 items.

For faster checkout, five sets of RFID-enabled POS systems have been installed in the shop. With these new POS systems, shop staffs do not have to scan each barcode on a sales item. RFID antennas are installed under the counter tops. When items are placed on the counter, the system automatically captures the product information and shows the total price instantly freeing the clerk to engage the customer in conversation. With RFID, the shop can provide customers smoother and more enjoyable shopping experiences.

I.T.'S. international has opened 2 more RFID-enabled shops in Tokyo. The company is now planning to install new RFID applications, such as RFID-based EAS system or intelligent fitting room.

3.2.2.2 Gas Industry: Activities of Japan Industrial and Medical Gases Association (JIMGA) (*2)

It is estimated that there are some 15 million gas cylinders in distribution in Japan. A variety of gases such as oxygen, hydrogen and CO2 are widely used in industry and there are also a huge number of high-pressure gas cylinders in use. But there had been no standardized method of managing gas cylinders. Some companies manage them using internal bar-code systems while other companies use numbers engraved on the cylinders. It is difficult to determine the actual owner of a neglected cylinder because one third of the gas distributors have not adopted a bar-code system. They just visually read the number engraved on a cylinder and copy it on a paper form. Neglected or missing high-pressure cylinders pose a very serious problem because of the risk of explosion due to corrosion.

The member companies of JIMGA had tried to solve

Fig 3.2.2.2-1 EPC/RFID operations at a gas filling station

*2 JIMGA

JIMGA strives to improve and rationalize the production, distribution, and use of industrial and medical gases as well as the production and marketing of facilities and equipment associated with medical gases and equipment associated with home therapy. Number of member companies: 1,200.

the problem using a barcode system, but it was not successful since there was no standardized barcode management method and no interoperability among the gas suppliers. In addition, barcode labels are not durable enough for business operations in such a harsh environment. JIMGA thus decided to try using EPC/RFID for managing gas cylinders.

JIMGA developed several types of EPC/RFID tags attachable to various types of cylinders up to last year and it is currently conducting tests with software. Tests in real environments will be conducted later this year.

Each tag encoding GRAI is read or written at gas filling stations by means of handheld scanners, and trucks carrying RFID-tagged cylinders pass through antenna gates for bulk reading of their cylinder shipments.

By using the standardized RFID system, JIMGA expects not only to solve problems such as the handling of neglected or missing cylinders but also realize more efficient distribution of gas cylinders as asset management.

3.2.2.3 Book Publishing Industry: Activities of JPO and trials

Japan's publishing industry has been suffering from a high return rate of books, which is estimated to be about 43%. In Japan's traditional book trade, consignment ordering, which allows bookstores to return unsold items anytime, is commonplace. This leads to retailers placing more orders than they can actually sell and too many returns.

Shogakukan, one of Japan's major publishers, has been trying to combat this issue through RFID implementation since 2008. The company attached UHF Gen2 tag labels to every single copy of the selected book title it published. As of the end of 2009, tagged titles amounted to five titles with total copies of more than 600,000. This enabled unique identification of the same title, and Shogakukan tried setting an optional order method with the same title trade terms. This option was non-consignment ordering, which offered bookstores a higher profit margin on each copy sold, but set some restrictions on returning unsold books. The publisher thought this would motivate retailers to sell more books and lead to a more realistic number of orders. Bookstores also found another benefit from this option. Every bookseller was able to receive the exact amount of books that they ordered with the option. In the current situation, the total amount of orders sometimes exceeds the amount of first copies. In such a case, publishers are unwilling to print extra quantities when there is a high risk of returns.

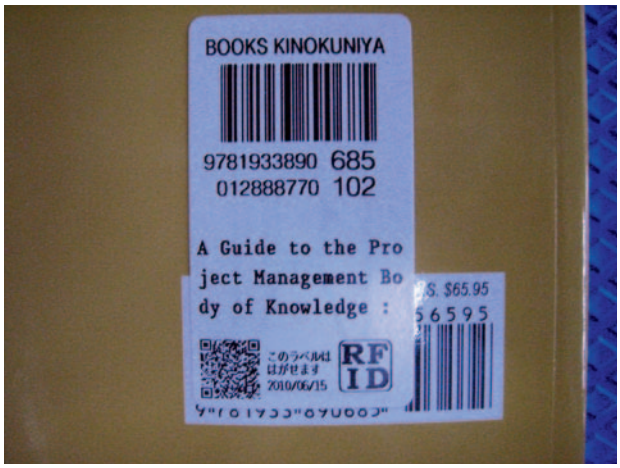
As a result, the return rate for the some of the tagged titles was reduced to less than 10%. Shogakukan was satisfied with this result and it is planning further implementation this year.

Moves to introduce RFID tags have begun not only in publishing companies but also in bookstores.

KINOKUNIYA COMPANY LTD., a large bookstore chain operating across Japan, on July 15, 2010 began attaching UHF Gen2 tags to the foreign publications it sells. Attaching tags to all of its stock of foreign publications would total some 230,000 copies. The prices of foreign publications differ even for the same title because the exchange rate differs at the time the item is imported, and in the past the International Standard Book Number (ISBN) code of the publication was the only data that Kinokuniya was able to use for sales management purposes. By utilizing electronic tags capable of identifying each copy, the company can now more accurately analyze its sales. Kinokuniya aims at increasing the efficiency of its inventory control, too.

Fig. 3.2.2.3-1 Tagged books

Fig. 3.2.2.3-2 Reading EPC tag in the bookstore and RFID tagged label



3.2.2.4 Study Committee for Global Supply Chain Visibility

Since FY2009, METI has hosted the Study Committee for Global Supply Chain Visibility. The committee consists of shipping companies, logistics companies and their trade organizations, and it has examined the required mechanism and rules for visualizing the entirety of supply chains with the aim of achieving higher efficiency of global supply chains.

Supply chain visibility seeks to realize easy collection, by businesses and organizations related to the supply chain, of such information as when and from where a given product has been shipped and through what logistics route it has been delivered to the retailer. The shipping of products is usually consigned to logistics companies, in which case, as soon as the product has left the manufacturer, it becomes very difficult for the manufacturer to know the whereabouts of the product. It is said that a shipper also has a need to know where the product it has shipped is, and as such, it is very beneficial to the shipper as well.

Supply chains are composed of multiple related businesses and organizations. Therefore, to check the whereabouts of products and articles flowing throughout the supply chain, there is a need for a mechanism that obtains information about their whereabouts from these businesses and organizations. The committee is discussing such matters as what benefits may be gained from supply chain visibility and what type of mechanism will be needed for the supply chain visibility platform.

GS1 EPCglobal publishes the EPCIS Standard Interface Specifications as a mechanism for visualizing supply chains. The Study Committee regards EPCIS to be a promising platform for visibility, and EPCIS is expected to contribute to supply chain visibility in the future.

4. Solutions

4.1 Healthcare

4.1.1 Pharmaceutical Products

4.1.1.1 Medical Prescription (Rx)

Medical errors and accidents happen so frequently that the need to standardize the supply chain from manufacturers to patients is widely recognized in the healthcare industry. And the Ministry of Health, Labour and Welfare (MHLW) announced an invitation for public comments on the draft "Implementation Guideline for Bar-coding of Prescription Drugs" in March 2006. This guideline was drafted with the full cooperation of FPMAJ (*1) and GS1 Japan. After gathering various comments from the public up until June, MHLW announced the guideline in September 2006.

This guideline adopts GS1-128, GS1 DataBar Limited and GS1 DataBar Limited Composite Symbology as well as GS1 DataBar Stacked and GS1 DataBar Stacked Composite Symbology as shown in Fig. 4.1.1.1-1.

MHLW decided to start full application of the Guideline in September 2008. For this reason, from spring to summer of 2008 labeling using the GS1 Standard System has been introduced at the plants of most domestic pharmaceutical manufacturers. The guideline requires the labeling of GTIN, expiration

Fig. 4.1.1.1-1 GS1 Barcodes in Healthcare

GS1 DataBar Composite

GS1 DataBar

GS1 DataBar

GS1-128

*1 FPAMJ
Federation of Pharmaceutical Manufacturers' Association of Japan

date and lot number on biological products only, but pharmaceutical manufacturers have also begun labeling other products such as general injections and drugs for internal use on a voluntary basis. Significant effects of the labeling are anticipated.

4.1.1.2 Over the Counter (OTC)

MHLW has not yet commenced a standardization initiative for over-the-counter (OTC) drugs.

4.1.2 Medical Devices

4.1.2.1 The guideline issued by MHLW

The Japan Federation of Medical Devices Associations (JFMDA) resolved to use the EAN/UPC and GS1-128 symbol in 1998, which was followed by the publication of the guideline in 1999 with the help of GS1 Japan. However, the use of these standards had been optional for each company.

In March 2003, MHLW published its "Vision for the Medical Device Industry." The accompanying "Action Plan" strongly encouraged the industry to promote the use of information technology systems to build a new product database and use bar codes to increase patient safety.

In 2004, for the purpose of inducing the implementation of the agreed-upon standard, MHLW started monitoring its use through JFMDA. MHLW has also been monitoring the coverage of item registration in the database.

In September 2007, MHLW announced the draft guideline for barcode marking on medical devices, which was prepared by joint effort with JFMDA. After taking public comment procedure twice where the draft was modified accordingly, MHLW issued the barcode making guideline in March 2008.

4.1.2.2 Implementation of the Guideline

According to the survey conducted by MHLW in 2009, more than half of medical devices existing in Japan are registered in MEDIS-DC database and 76.0% are shipped with GS1-128 symbol labels as shown below.

4.1.2.3 Direct Marking for Surgical Instruments

Japan Association of Medical Equipment Industries (JAMEI) published the first guideline for laser marking 2D symbols on surgical instruments for the purpose of patient safety, traceability and effective stock control at the hospitals in November 2006. Since QR code is ISO standardized and so popular in Japan, JAMEI has selected QR code in addition to DataMatrix as

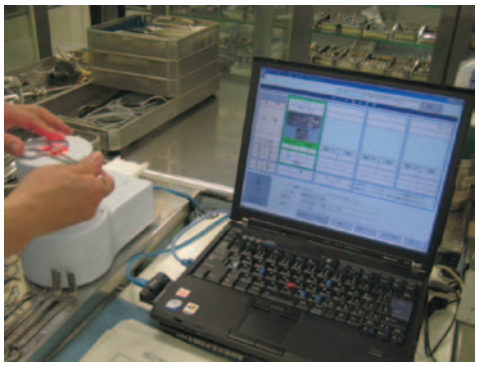
Table 4.1.2.2-1 MHLW Guideline for Barcoding Medical Devices

		package		Unit	
		outer	inner		Option (small size)
Symbol	GS1-128	○	○	○	
	ISO 2D Symbols				○
Indicator Digit		1 to 8		0	
Application Identifier		(01) (17) (10)or(21)		(01) (17) (10)or(21)	

Table 4.1.2.2-2 Barcoding Medical Devices in Japan

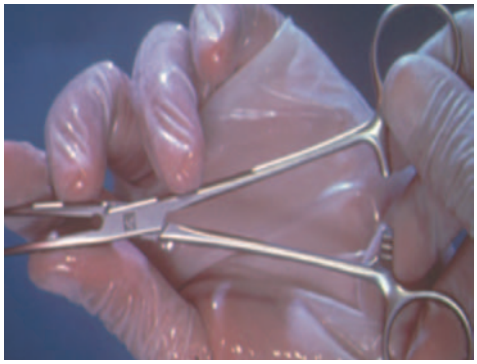
	As of 30 September 2009	As of 30 September 2008
Number of items with GTIN-13	94.1%	93.1%
Number of items registered to MEDIS-DC Database	57.4%	53.8%
Number of items GS1-128 barcoded	80.8%	71.1%
Number of individual package unit items GS1-128 barcoded	65.1%	—

Fig. 4.1.2.3-1 Surgical Instrument

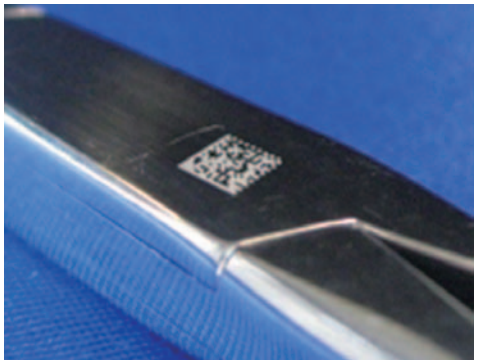


Scannig Instruments

Scanner



Laser marked scissor



2D data carrier

standard for 2D data carrier.
In July 2010 the GS1 Healthcare Japan (See 6.2) also established the "Subcommittee for the Marking of Surgical Instruments," and surgeons at medical institutions, surgical instrument manufacturers, laser marking agents and other interested parties are studying the method for marking the GTIN and serial numbers on surgical instruments.

4.2 Food Traceability

4.2.1 Beef

After the outbreak of the BSE scare in 2001, securing the traceability of beef produced in Japan became a pressing issue. When the Beef Traceability Law took effect on December 1 2003, the traceability of domestically raised cattle was mandated. The traceability system encompasses supply chain businesses such as producers, slaughterhouse operators, packers, distributors and retailers.
Today, every one of more than 4 million cattle raised in Japan (cattle born in or imported live into Japan) is assigned a 10-digit individual cattle ID number by the National Livestock Improvement Center, a government affiliated organization that manages the national cattle database. Each beef cow wears two ear tags marked with this ID number. Information on each beef cow including the gender, breed, date of birth, feeder's name, date of slaughter, is recorded and stored in the database.
When meat packers distribute their product (meat parts or sub-prime cuts) to wholesalers or retailers, they must include the cattle ID number on distribution label on the carton or shrink-wrapped package.
The 10-digit cattle ID number is encoded in a GS1-128 barcode using AI (251) together with other information keys including GTIN (assigned by the packers), weight, production date, carton ID, and lot number.
It is mandatory to display either the cattle ID number or lot number on a meat package sold to consumers at retail establishments. Most retailers display the cattle ID on the meat label. Retailers produce consumer package labels that state the cattle ID number in human readable numeric format captured from the barcode on the distribution label.
Consumers can trace information about the beef they have purchased using this ID number as a key on the website of the National Livestock Improvement Center. Some consumer package labels carry a 2D QR code prepared for reading by mobile phone users that contains a hyperlink to the national database website. This gives consumers an alternative way to access information about beef cattle, as the QR code can be read and decoded using many types of mobile phones sold in Japan.

Fig. 4.2.1-1 Japanese beef traceability System

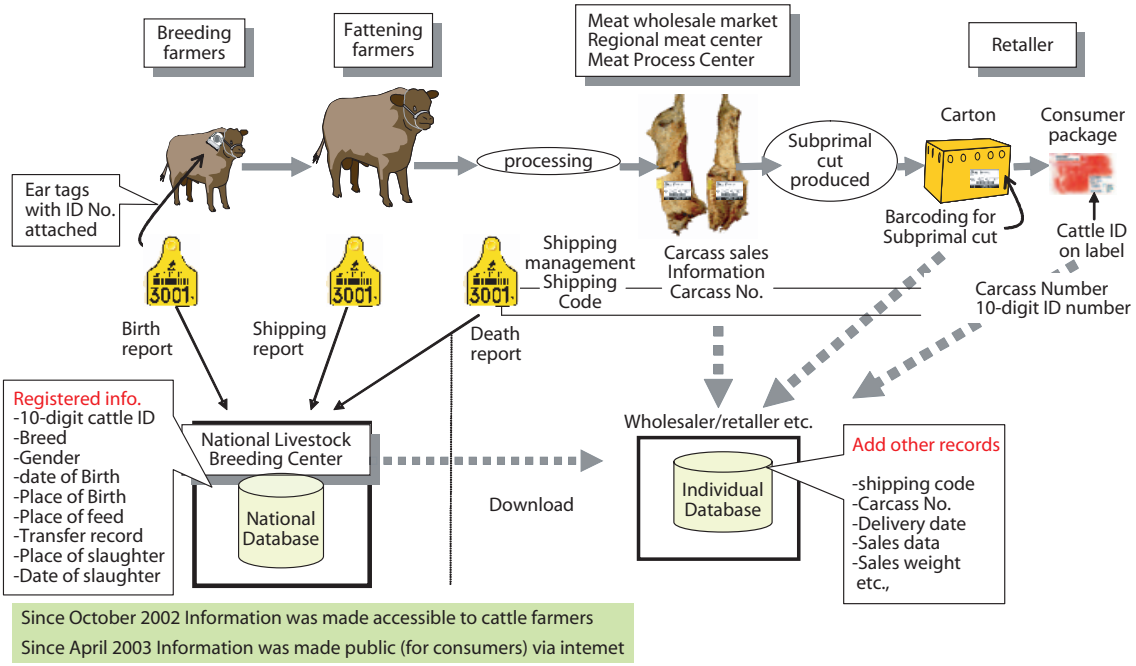
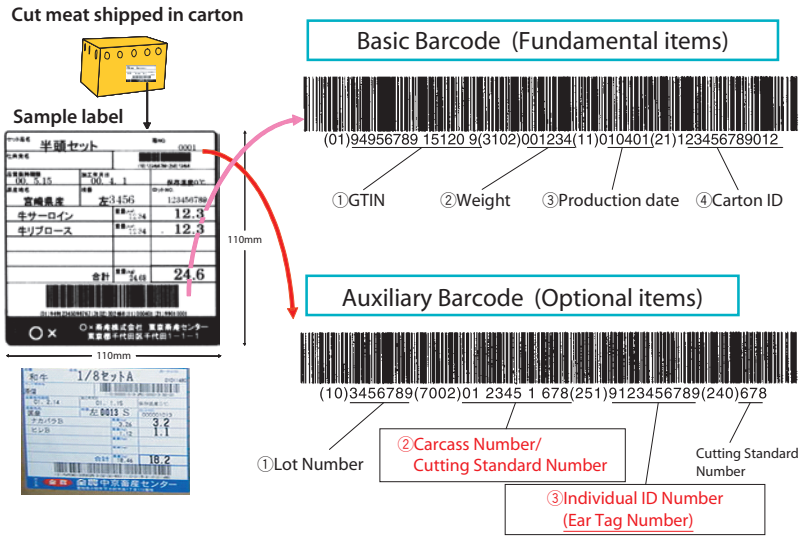


Fig. 4.2.1-2 Tag

Fig. 4.2.1-3 Standard Physical Distribution Barcode Label System for Meat



The law also covers restaurants that specialize in beef dishes, such as sukiyaki, steak, and barbecue restaurants. These restaurants are required to clearly display the cattle ID or lot number of the beef used in the dishes served to customers.

Before the BSE issue arose in Japan, a standardized GS1-128 data format used as a distribution label for meat products (shown Fig. 4.2.1-3) had already been in place through a voluntary initiative in the meat packing industry. After the regulatory requirement took effect, the Cattle ID number was incorporated into the label later.

4.2.2 Pork and Poultry

A compulsory law like the Beef Traceability Law does not exist for pork and poultry. However, in spring of 2007, the meat industry introduced the GS1 Standard System for pork and Poultry and uses it in a similar way to the Beef Traceability Law to prevent transmission of infectious diseases to consumers and avoid the loss of sales opportunity.

4.3 Mobile Solutions

The following section explains typical solutions enabled by scanning QR codes with camera-equipped cell phones. Specific cases studies are also explained.

4.3.1 Typical solutions

(1) Access mobile websites with QR code

Encode URLs of mobile websites into QR codes and print them on products or sales promotion tools. Then users can access those websites by simply reading the QR codes with their camera phone. This type of advertising is more effective than using flyers and pamphlets.

Fig 4.3.1-1 Access mobile websites

Courtesy of NTT docomo

(2) Access product order websites with QR code

Encode product order URLs of mobile websites into QR codes and print them in magazine ads or pamphlets. Then users simply scan a QR code to access the product ordering page. Users can place orders anywhere and at anytime. QR codes allow sellers to take full advantage of more business opportunities.

Fig 4.3.1-2 Access product order websites

Courtesy of NTT docomo

(3) Enter contact data into cell phone address book with QR code

Encode contact information, such as name, phone No., and email address, into a QR code and print it on their business cards. Contacts who receive their cards can enter the data into their address books by simple cell phone scanning operations. This type of business card will be welcomed by business people who can save time typically needed to enter contact information.

Fig 4.3.1-3 QR Code on Business Card

Courtesy of NTT docomo

4.3.2 Case studies

(1) Product information (A food manufacturer)

Problem: There was no convenient way to convey information to product purchasers and no handy tool to advertise product values in the most effective manner.

Solution: QR codes on product packaging (Fig.4.3.2-1)

Effect: QR codes make Web access easy. Customers can download information such as video taped recipes anytime and anywhere they need to.

(2) Searching for tour packages and making travel bookings (A travel agent)

Problem: Counter attendants can accept travel bookings only for a limited time range. On the other hand, few people make travel bookings at websites that require use of PC.

Solution: QR codes on travel brochures (Fig.4.3.2-2)

Effect: Information is available 24 hours a day. Cell phones are easier to operate than personal computers. QR codes create more new business opportunities.

(3) New product promotions using QR codes

QR codes are being used as product promotion tools, too. In the past, when consumers wanted to take part in a product promotion, they had to read the QR code containing the URL information with their cellular phone, access the mobile site and then enter about 14-digit promotion numbers as proof of their purchase. In other words, QR codes were used only as a tool for enabling initial access to the site. Toppan Printing Co. developed a mechanism by which a QR code with a unique ID could be printed directly on each product package which would enable a consumer to participate in a product promotion campaign with a single click on their cellular phone.

Because the QR code is printed on the inside of the packaging, only consumers who actually bought the product would be able to join the campaign (see

Fig 4.3.2-1 Recipe Suggestion by mobile

Courtesy of NTT docomo

Fig 4.3.2-2 Travel Reservation site

Courtesy of NTT docomo

Fig 4.3.2-3 Product Package

Fig 4.3.2-4 Mobile Phone with Barcode Reader

Fig.4.3.2-3). This would also enable the product manufacturer to target their marketing directly linking the product and the consumer. Campaigns using this mechanism have had many more participants than in conventional campaigns where promotion numbers must be entered manually to participate.

(4) Mobile Ordering System

In Japan, business data are exchanged among manufacturers, wholesalers and retailers. Wholesalers support retailers by providing information and distribution. Ohki Co., a drug wholesaler, uses cellular phones for an ordering system between small and medium drugstores and Ohki. This is a case of a B2B system using cellular phones.

The mechanism installed at a drugstore is very simple. Ohki lends the drugstore a cellular phone that has ordering software installed in the phone. The drugstore scans the EAN symbol of a product they want to order using a barcode reader connected to the cellular phone (see Fig.4.3.2-4) and simply enter the quantity of the order. The order data are sent to Ohki's computer by the cellular phone, and acceptance or non-acceptance of the order is reported back to the drugstore's cellular phone in only two to three minutes.

Using cellular phones, Ohki was able to promptly provide information to and from wholesalers and quickly respond to order data from drugstores. The two-way

communication of cellular phones enabled the company to provide sales promotion information on a timely basis and to send information about returns and future plans. Because they used cellular phones, Ohki was able to cut maintenance costs and simplify the maintenance system more than if they had decided to use special-purpose PDAs or custom-equipped cellular phones.

By introducing Ohki's system, drugstores were able to simplify their product master maintenance and they were also freed from having to maintain special hardware or software.The advantages to the wholesaler are that the ordering tasks of their salespeople were streamlined and that it became easier to manage the trade terms of individual drugstores.

Japan's Pharmaceutical Affairs Law was amended in 2008, and now it requires drugstores to provide accurate information about over-the-counter drugs to their customers at point of sale. Ohki is working to improve its cellular phone system so that it can provide the information that will be required under the amended law in addition to sales promotion data.

The System won the prize of the award "MCPC 2009 Special Award" by MCPC (Mobile Computing Promotion Consortium) in Japan.

(5) Mobile Coupon System

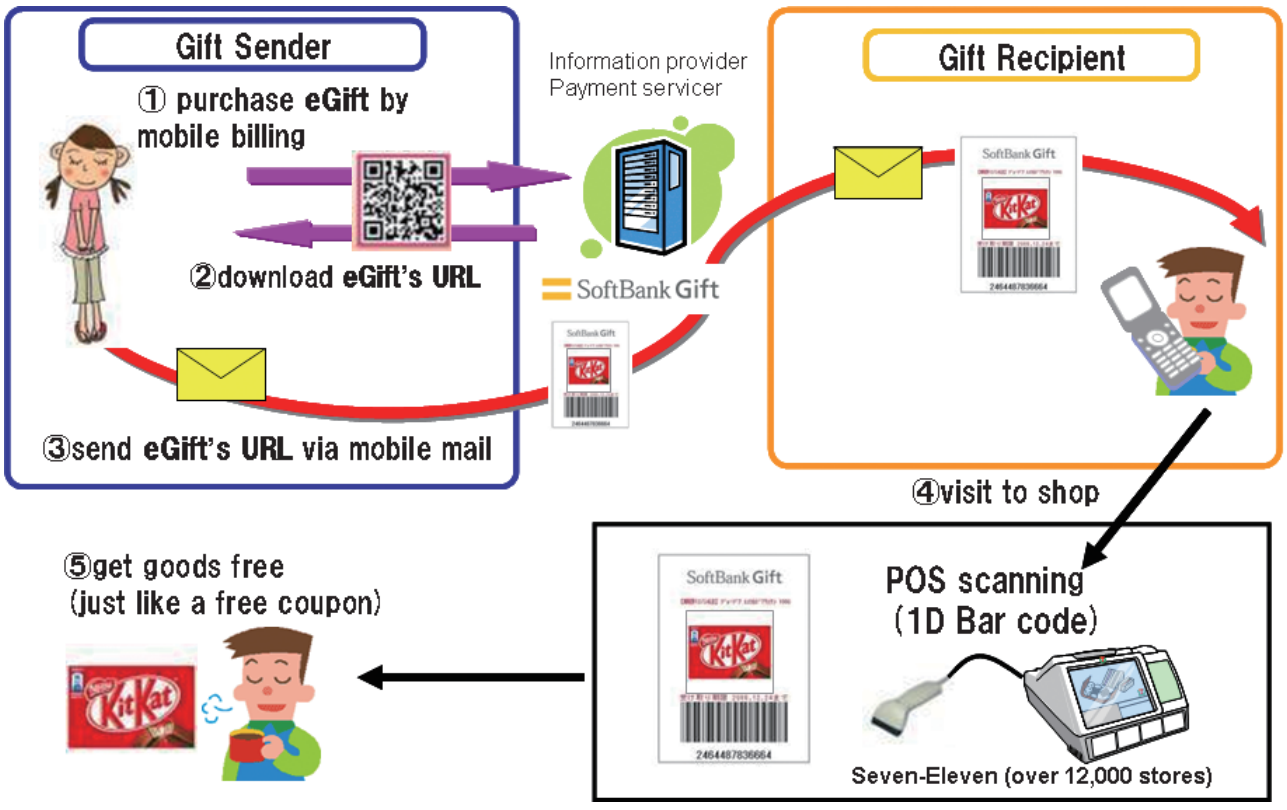
In Japan, a variety of coupon systems using the email and web functions of cellular phones have been introduced in the food service industry and many other types of business. To use this system, customers show a coupon distributed by email on their cellular phone screen or access a website using their cellular phone to receive a discount or other service. However, this system only displays the website and cannot link each use of the coupons to individual customer attributes, to know, for example, what kind of customer has used which coupons when, where and how often.

Softbank Gift Corp. provides a coupon service system on cellular phones where 1D barcodes are displayed on a phone's screen. This service is called "Potitto Gift" (or mobile gift) . Using a gift format, this coupon service enables information to be deleted so that the provider and consumer can use it on one-to-one basis. This service can be used at convenience stores, CD shops and other retailers. Convenience stores started offering this service in November 2008.

The mechanism of the service is described below (see Fig.4.3.2-5). Four parties are involved in this service: the sender of a gift, the service provider Softbank Gift, the recipient of the gift and the store.

The sender of the gift first follows the procedure for buying the gift at the Softbank Gift website. The website then collects such information as the email

Fig. 4.3.2-5 "Pottito Gift" Service System



address of the recipient, the product selected and the payment method chosen. Delivering the gift based only on the recipient's email address is the special feature of this system. Not only individuals but also companies may send gifts, and companies can use the system as a means of sales promotion. The sender can choose to pay either by credit card or by adding the gift amount to his/her cellular phone bill. Two methods are also available for receiving the gift: the recipient can pick it up at the store or have it delivered at home. The in-store pickup service is as follows: When the purchase of the gift is completed, an email confirming the purchase of the gift is sent to the recipient by Softbank Gift. Upon receiving the email, the recipient checks the deadline for getting the gift and can decide whether or not to accept the gift. If the recipient decides to receive the gift, information that the recipient can exchange for the gift is sent by email. This email contains a 1D barcode for receiving the gift and the deadline for receiving it. To pick up the gift, the recipient goes to the store, displays the coupon barcode on their cellular phone screen, and has the barcode scanned by the store's barcode reader, thereby the coupon information is deleted.

The advantages of this service are that it can be used by most cellular phone users in Japan and that it uses 1D barcodes. This enables a recipient to pick up a gift at any convenience store in Japan. The system has another benefit: no shipping fees are needed because the recipient picks up the gift at the store.

This service from Softbank Gift can be used with most major types of cellular phones available in Japan, and many kinds of cellular phones can display a barcode on its screen, which can be read at in-store POS terminal.

As another example, McDonald's Japan and The JV Co., which is responsible for the planning and management of customer services for mobile members of McDonald's Japan, provide these members with the Waving Coupon, a new coupon system using the Osaifu-Keitai (*1) function of cellular phones, an exclusive service for cellular phone users in Japan. The mechanism of this service is shown in the figure below.

*1 Osaifu-Keitai (mobile wallet)
The system that allows cellular phone owners to use the FelliCa contactless IC card incorporated in cellular phones as electronic money, a membership card various groups, loyalty point card for general retailers, and a train, bus or airline fare payment method.

5. Database Services

5.1 JICFS/IFDB (Japan Item Code File Service/Integrated Flexible DataBase)

Since 1988, GS1Japan has been operating the JICFS/IFDB database of product catalogues. Basic product data (e.g., GTIN, product names, product categories, weights, and amounts) are collected and maintained in the JICFS/IFDB and used for POS masters for retailers and EOS masters between wholesalers and retailers as part of the supply chain information infrastructure. As of March 2010, product information data registered in the JICFS/IFDB covered some 5 million products from 20,000 manufacturers. The number of users is about 4,700 companies, of which 80% are retailers and 10% are wholesalers. Some of the data are provided by several product databases constructed for individual industries. The 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. 5.1-1).

JICFS/IFDB data is recently being used for a variety of purposes, including Internet shopping portals such as operated by Yahoo! Japan and for marketing research. Also, use of the database to assist shopping by consumers with disabilities is being tested.

Fig. 5.1-1 JICFS/IFDB System Flow

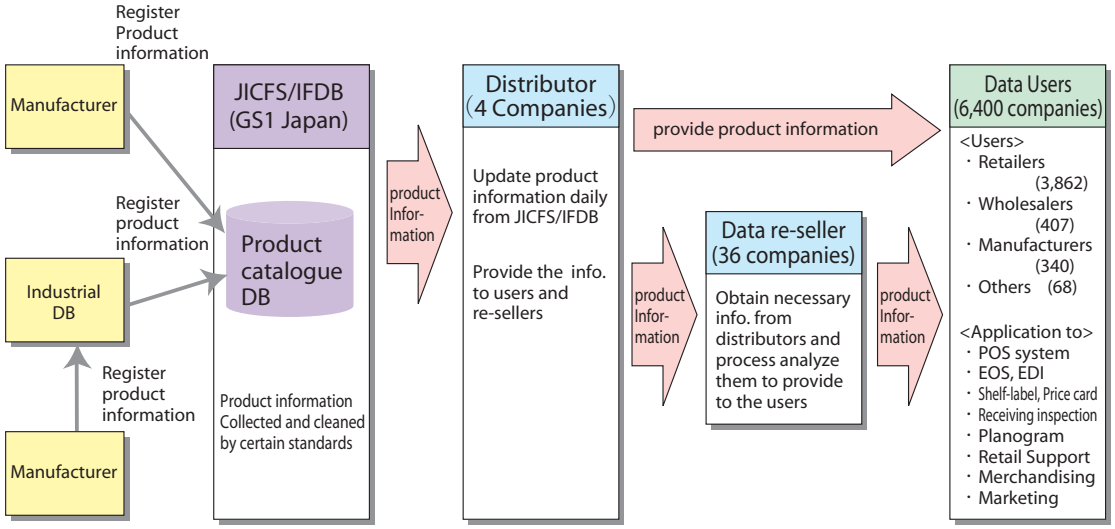


Table 5.1-1 JICFS/IFDB Number of Item Registration by Year (as of end of March)

	2006	2007	2008	2009	2010
Food	754,778	749,757	819,305	841,245	947,898
Commodity	548,576	489,226	493,200	483,683	533,279
Recreation and Miscellaneous	183,774	194,781	229,594	240,320	277,535
Durable Goods	128,416	131,572	146,979	153,531	173,835
Apparel, Personal items & Sporting goods	143,791	131,001	145,917	150,814	167,611
Others	5,081	5,049	4,382	3,677	3,608
Active item Total	1,764,416	1,701,386	1,839,377	1,873,270	2,103,766
Non-Act Data	2,476,437	2,777,762	2,958,804	3,104,154	3,104,154
Grand Total	4,240,853	4,479,148	4,798,181	4,977,424	5,207,920
Number of item increase (against previous year)	300,462	238,295	319,033	179,243	230,496

5.1.1 Growing Use of JCFS/IFDB for Internet shopping websites

By using the 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 widely utilized by small and medium enterprises.

In Internet sales, the portal site provider had difficulty to manage product information because stores managed product information using their own codes and product names. Even the same products were often registered under different names and categories. As a means to solve this problem, Yahoo Japan Corporation and other Internet businesses have started using the JICFS/IFDB data to unify the management of their product information.

5.1.2 Exploring the possibility for helping shoppers with special needs

The use of the JICFS/IFDB has been promoted not only in the retail supply chain, where the database is already in wide use, but also in the area of social welfare. The Forum on Co-creation of Universal Design by Cooperation of the Information Processing Society of Japan has started voice guidance tests as social welfare experiments for visually impaired consumers in which the consumers themselves scan a product's barcode to have their personal computer or other device speak the name of the product (Fig. 5.1.2-1). The barcode on canned beverages is printed lengthwise (in ladder orientation) on the side of the can in most cases. As such, visually impaired consumers can scan the barcode and have the product name spoken to them by simply rotating the can in front of a handy scanner (Fig. 5.1.2-2). This scanning method can also be used for yogurt, custard and many other packaged products.

Fig 5.1.2-1 Overview of product name reader tests

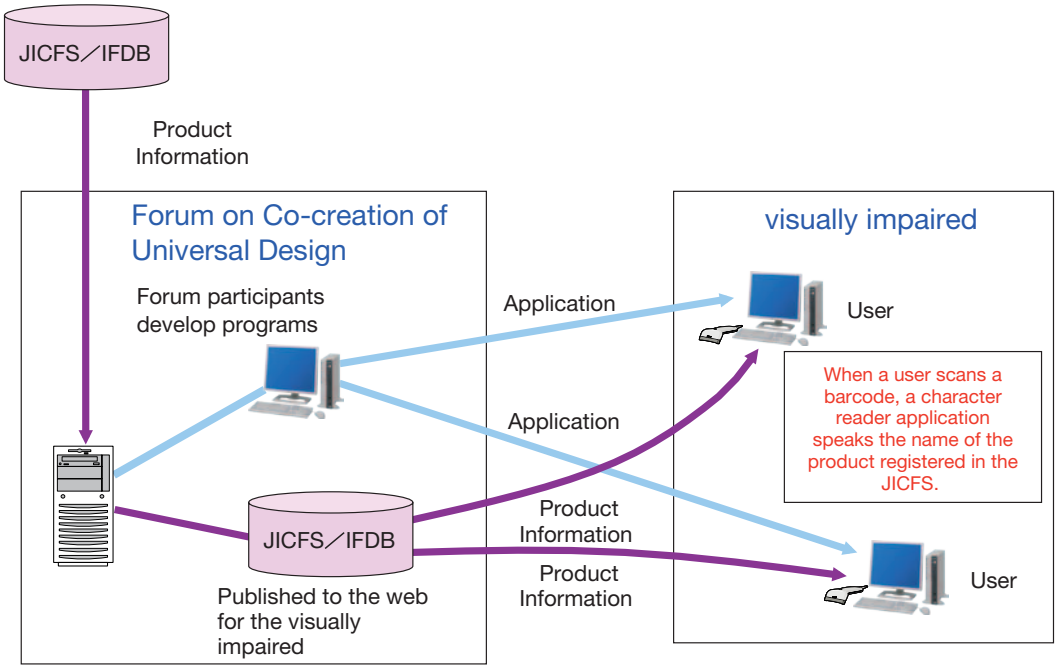


Fig 5.1.2-2 Example of scanning a barcode on a canned beverage

5.2 RDS (Ryutsu POS Database Service)

RDS is a POS database service, collecting POS data from retailers and gives them feedback and to distribute analyzed data to wholesalers and manufactures. It is now an infrastructure for market research or retail support available at low cost. The users are retail and wholesale industries as well as local and small-scale manufacturers (see Fig. 5.2-1 for RDS System for data collection and distribution scheme).

The word RDS stands for Ryutsu POS Database Service, and the Japanese language term "Ryutsu" collectively refers here to manufacturers, wholesalers and retailers. in the first pilot of the development and operation of the RDS we conducted in 1985, when POS systems were just coming into use in Japan, aiming at establishing market research services through the use of POS data.

5.2.1 Enhanced function and extended use of RDS

For its member retailers, RDS used to provide data in a file format that compared members' product prices and sales volumes with those of other stores. In 2005, RDS was upgraded to the Web-based POS Data Analysis Service, which offers the results of POS data analysis via the Internet. The primary feature of the new service is that anyone can easily compare and analyze one's own POS data (sales status) with data from other stores (store names undisclosed). This function allows users to readily find missing items in product lines or pricing errors, which their individual POS data would not reveal (see Fig. 5.2.2-1).

The information can be also utilized as effective tools by wholesalers to provide retailers with well-developed support, such as proposals for selection of product lines targeted to market trends, and by product manufacturers for product development as well as planning and reviewing sales strategies. Additionally, RDS data has recently been used by some Japanese universities as basic data for economic analysis.

5.2.2 RDS helps retailers and wholesalers for better merchandising

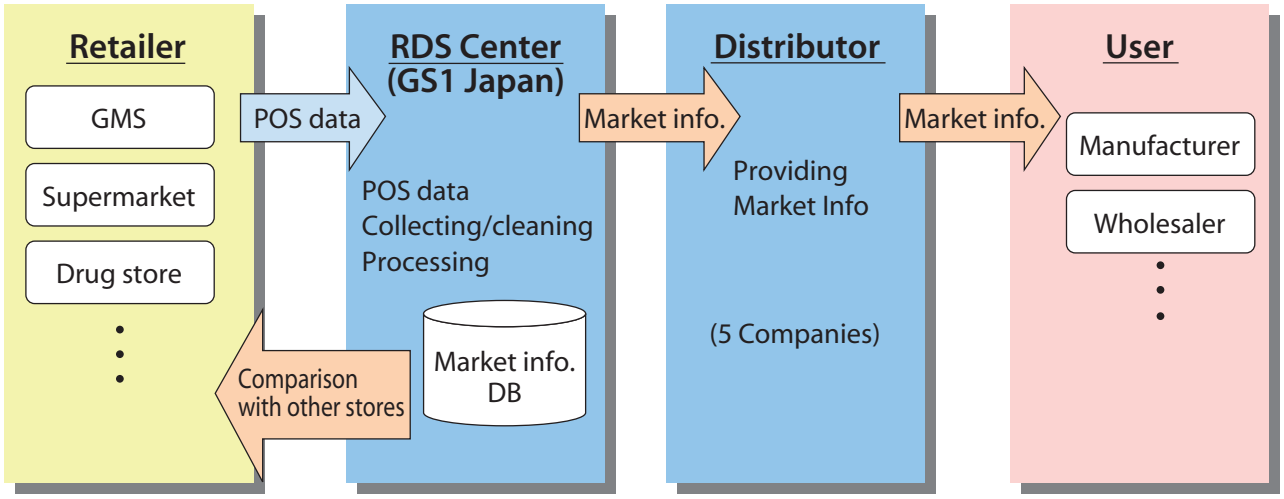
Retailers participating in RDS have used the Web-based POS Data Analysis Service as follows:

Food Supermarket A utilized the Web-based POS Data Analysis Service for selecting on-sale seasoning products to be printed on a flyer.

The Supermarket decided to list, in consultation with its suppliers, about 20 top-selling seasoning products that were being handled by many stores and were included in the Web-based POS Data (local POS data) for the same month in the previous year.

The company searched for products with two criteria; the ratio of stores selling the seasonings to 70% or more and the PI (*1) quantity to 1.8 or more. From the 15 applicable products listed, the supermarket A decided to pick up product X as a sale item, which they had not done very often. They referred to POS Data Analysis Service for the average selling price to

Fig. 5.2-1 RDS System



*1 PI

Short for purchase index and shows the number of products (product group) or sales amount purchased per 1000 shoppers. It shows the strength of customer support for product (product group) in numerical values.

*PI amount = amount of sales per 1,000 customers who purchased in the store.

*PI quantity = quantity of products sold per 1,000 customers who purchase the store.

Fig. 5.2.2-1 Web-based POS Data Analysis Service

No	新規	JANコード	商品名	JICFS分類名	P数量 0807	平売価 0807	扱い率 0807
1		4901577000058	キユーピー マヨネーズ 500g	マヨネーズ	5.49	211	89.80%
2		4901577003592	QP 深煎りごまドレッシング 瓶 200ml	ドレッシング	3.64	188	100.00%
3		4902106271208	ミツカン 穀物酢 500ml	食酢	3.61	107	97.96%
4		4901001003037	味の素 ピュアセレクトマヨネーズ 400g	マヨネーズ	3.32	190	85.71%
5		4902381001316	にんべん つゆの素 ペットボトル 1L	つゆ	3.16	406	95.92%
6		4901577037801	QP ハーフ 400g	マヨネーズ	2.96	221	95.92%
7		4901515330827	キッコーマン 本つゆ ペット 1L	つゆ	2.85	248	77.55%
8		4902106647027	ミツカン 追いがつおつゆ2倍 1L	つゆ			
9		4901002887032	SB 本生生わさび 43g	からし・わさび			
10		49685183	ミツカン 味ぽん 360ml	合わせ酢(和風)			
11		4903001067422	ヤマサ 昆布つゆ 1l	つゆ			
12		4901002066550	SB おろし生わさび 43g	からし・わさび			
13		49730135	リケン スーパードレ ノンオイル青じそ 190ml	ドレッシング			
14		4901002066581	SB おろし生しょうが 40g	香辛料(からし・わさび以外)			
15		4901306010532	カゴメ トマトケチャップ チューブ 500g	ケチャップ			

decide the sale price.

Fig. 5.2.2-1 shows seasoning products sold by 70% or more stores, and with a PI quantity of 1.8 or more as identified by the Web-based POS Data Analysis Service.

Because it succeeded in increasing its sales of product X, Company A plans to expand its search for sales items to other product categories using the Web-based POS Data Analysis Service.

6. Approach to Industry

6.1 Supply Chain Standards Management & Promotion Council

In April 2009, Supply Chain Standards Management & Promotion Council was founded by various industry groups and businesses to help promote efficient supply chain information system in Japanese retail industry. The activities of the council includes maintenance and promotion of Ryutsu Business Message Standard (see 2.1.1), which was initially developed under the support of the Ministry of Economy, Trade and Industry. At the moment, GS1 Japan acts as a secretariat of the council.

The Supply Chain Standards Management & Promotion Council held its inaugural General Assembly in Tokyo in April 2009.

The council includes the trade associations of producers, distributors and sellers in the consumer goods industry as full members and IT businesses as supporting members. As of July 2010, it has 48 full member organizations and 139 supporting members.

In 2010, the council is being operated by the structure shown below:

(1) General Assembly

The council holds its general assembly once a year. It approves the results of activities of the previous year as well as the new work items for the next year. It also appoints the officers of the council. At the inaugural general assembly held in April 2009 president and managing vice-presidents were elected. The terms of these officers are two years.

(2) Executive Committee

The role of the executive committee includes making important decisions on the council's management: admitting new members, establishing and abolishing working groups, and appointing working group members. In 2010, the committee is composed of 14 of the full member organizations.

(3) Working Groups

The Council has six working groups as following (See Fig. 6.1-1).

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 a change or addition to the established standards. The group examines such requests, decides on the steps to be taken, revises the relevant guideline and publishes the new standards.

2) Product Master Data Working Groups

This group maintains and manages the Ryutsu BMS messages pertaining to the exchange of product master data and related guideline, as well as updating standard master data items.

3) 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.

4) Logistics System Working Group

This group maintains and manages the implementation guideline for dispatch lists used together with logistics labels inked to the message of the Ryutsu BMS.

5) Ryutsu BMS Web EDI Working Group

The group will gather requirements on Ryutsu BMS compliant Web EDI system and service and publish

Fig. 6.1-1 Management system of the council (2010)

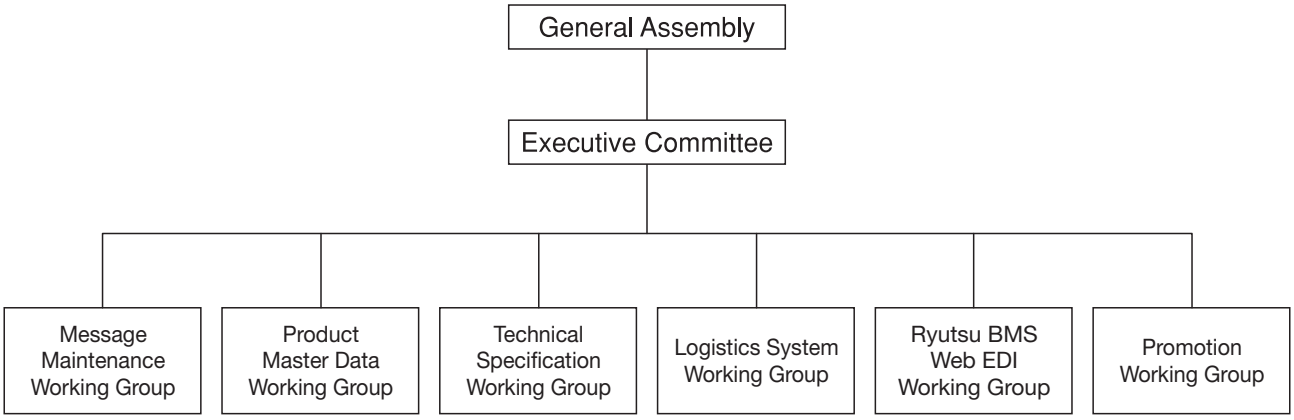


Fig. 6.1-2 Ryutsu BMS Forum & Exhibition 2009

500 attended at the Forum

600 visited the Exhibition

Fig. 6.1-3 Ryutsu BMS logo

みんなつながる 流通BMS

the guideline.

6) Promotion Working Group

This group examines and implements steps to diffuse the Ryutsu BMS among SMEs.

(4) Activities for diffusion and promotion

To diffuse the Ryutsu BMS, the council is doing the following activities:

1) Dispatching lecturers to meetings held by full members

At the request of a full member, the council sends specialist lecturers to a committee meeting, briefing or other event held by the full member.

2) Holding lecture meetings on the Ryutsu BMS

The council holds courses on the Ryutsu BMS every month in three categories: introductory, implementation and perishable foods courses.

3) Holding seminars for diffusing the Ryutsu BMS

The council holds a half-day seminar on the Ryutsu BMS at several main cities across the country.

4) Holding the Ryutsu BMS Forum & Exhibition

Just as last year, the council will hold the Ryutsu BMS Forum & Exhibition in November, 2010. At this event, in addition to various seminars and panel discussions, Ryutsu BMS-related products will be exhibited by supporting members.

(5) Registration of the Ryutsu BMS trademark

GS1 Japan has applied for trademark registration of the Ryutsu BMS logo to be used for recommending products and services that comply with the Ryutsu BMS specifications.

6.2 GS1 Healthcare Japan

6.2.1 Aiming at preventing medical errors and ensuring patient safety

The healthcare industry throughout the world has been taking various steps to prevent medical error and in-hospital infections and to promote patients safety. In addition, it has recently been globally recognized as important to exactly identify the types of drugs and medical instruments and materials in manufacturing, logistics, use for diagnosis and treatment and collection of these products to be able to prevent errors and increase the efficiency of healthcare services. Responding to these situations, GS1 has held international GS1 healthcare conferences in cooperation with healthcare organizations all over the world.

In October 2008, the GS1 Healthcare Conference took place in Tokyo, Japan for the first time in Asia. At this conference, there were lectures on activities for standardization by regulatory authorities and industry groups from various countries and on the pioneering attempts by medical institutions and medical equipment manufacturers. Reports on the traceability management system for steel instruments adopted by Japanese medical institutions and on endoscopes developed by Japanese manufacturers were highly rated by participants. Considering that this international conference held in Tokyo greatly increased interest in GS1's healthcare activities throughout the Japanese healthcare industry, GS1 Healthcare Japan was founded in May 2009.

6.2.2 Purposes of GS1 Healthcare Japan and its membership

The goal of GS1 Healthcare Japan is to achieve the patient safety by preventing medical errors using GS1 Standards. Traceability in healthcare, efficient logistics and administrative work will also be realized in this effort. The council is going to carry out various projects using product identification with barcodes, 2D symbols and RFID to promote standardization and implementation, in close cooperation with trade associations, government offices and other organizations. It hopes to contribute to the overall development of healthcare industry. As of Oct. 2010, GS1 Healthcare Japan has 45 corporate members, 15 individual members, 16 trade associations and 23 supporting members.

Executive Council Members

Kanto Medical Center NTT EC
Edwards Life Sciences LLC.
Sakura Seiki Co., Ltd.

Covidien Japan Co., Ltd.
Nihon Kohden Corp.
Mediceo Paltac Holdings Co., Ltd.
Eisai Distribution Co., Ltd.
Olympus Medical Systems Corp.
Johnson & Johnson K.K.
TERUMO Corporation
Banyu Pharmaceutical Co Ltd

6.2.3 Activities of GS1 Healthcare Japan

The activities of GS1 Healthcare Japan are as follows:

1) Standardization and research activities.
   - Examine the most appropriate product identification for medical instruments and materials.
   - Examine the most appropriate product identification of regulated pharmaceuticals.
   - Examine the most appropriate means of safety for healthcare at medical institutions using automatic data capture.
2) Information exchange with manufacturers, wholesalers, medical institution and regulatory bodies through GS1 Healthcare conference and research missions.
3) Based on the activities mentioned above, exchange information with and make proposals to government agencies.

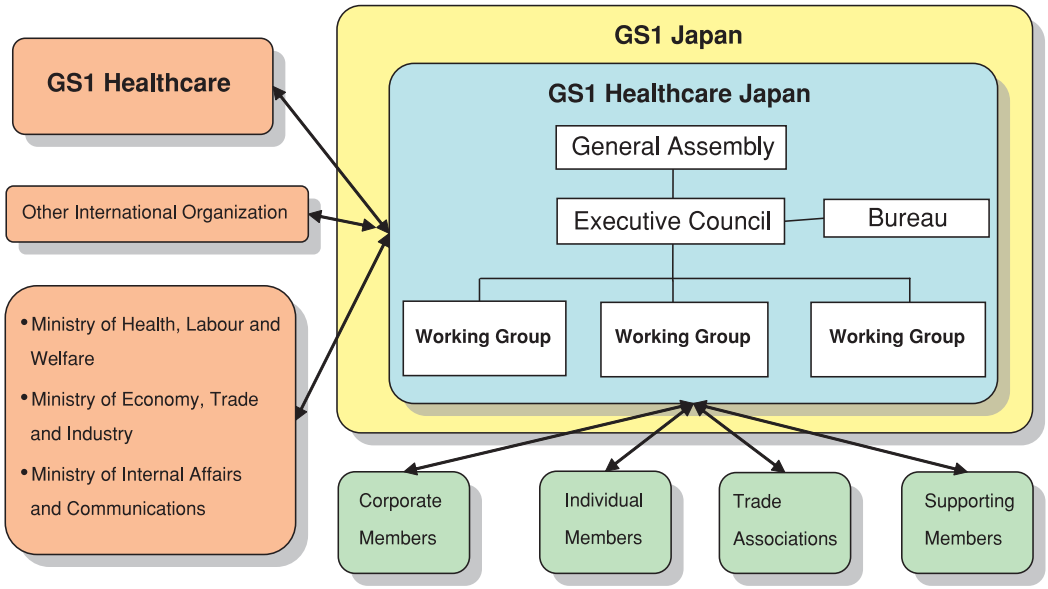
In the summer of 2009, GS1 Healthcare Japan has started to hold working group meetings.

Fig. 6.2.3-1 General Assembly

Fig. 6.2.3-2 Surgical Instruments on Reader/Writer

Fig. 6.2.3-3 Ceramic RFID Tags attached to medical devices

Fig. 6.2.3-4 Governing Structure



7. Study Groups

7.1 Study Group for Supply Chain Information Systems

We have a membership-based workshop engaging in systematization of distribution information promoted by GS1 Japan since 1977.
This study group holds monthly seminars on various subjects such as global standardization, state-of-the-art technology, implementation case studies and overseas trends. It also organizes study tours and discussion sessions. The workshop functions as an information exchange between members and GS1 Japan, as well as between the members themselves.
In FY2010, the workshop has a membership of 72 companies including retailers, wholesalers, product manufacturers, system vendors and consulting firms.
The main workshop topics are as follows:

- Ryutsu BMS in its full-scale diffusion stage
- Effective use of information systems and equipment by small-scale retailers
- GS1 Standards and EPCglobal
- Introduction of IT to the pharmaceutical and medical equipment industries
- Product databases and POS data
- IT utilization in the distribution industry
- Latest logistics information systems in the food and FMCG industries
- Latest logistics information systems in the apparel industry
- Activities for food product safety

7.2 Study Group for ICT-Oriented Wholesale Industry

In 1985, we set up a study group aimed at promoting computerization of the wholesale industry with GS1 Japan as its secretariat. 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 its membership is currently 42 companies.
The group is divided into several sub-working groups according to members' interests, and each hold monthly meetings. There are other activities including an annual forum, which is the biggest event, training seminars for new employees in wholesale companies, and advanced technology study tours.
In 2009, we closed a chapter in our activities for freshness management by publishing our "Guidelines for Freshness Management in Intermediate Distribution."
In 2010, we will take up a new subject, "Environmental Problems the Wholesale Industry Should Address."

Fig. 7.2-1 ICT-Oriented Wholesale Industry Forum

7.3 Study Group for 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. The study group has about 70 corporate members that are representative of Japan's processed foods, marine products, and liquors businesses. GS1 Japan serves as the group's secretariat.
The study group conducts joint studies on new issues concerning standardization of B2B data exchanges among companies in the supply chain. It holds regular meetings four times a year where best practices are introduced. It also organizes seminars on the latest topics by invited outside lecturers and study tours to pioneering businesses. The group also serves as a place for gathering and summarizing the opinions of those in the industry.
Distribution and supply chains in Japan are composed of three parts-product manufacturers, wholesalers and retailers-thus it is important for us 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.

8. Supporting IT Implementation at Local Shopping Streets

It is estimated that there are about 13,000 shopping streets throughout Japan. Such shopping streets are composed mainly of small retailers and service traders (hereinafter "SMEs"). And they have recently been revalued because they not only supply products and services but also support the community infrastructure by, among others, maintaining and inheriting community and traditional culture and helping to keep the town safe. However, these SMEs have increasingly gone out of business for various reasons recently, and shopping streets have continued declining since the peak in 1982.

As part of the efforts to help SMEs use Information and CommunicationsTechnology (ICT), which tends to lag behind the adoption rates of large retailers, GS1 Japan has conducted, in cooperation with shopping streets, studies and pilots on various ICT systems and has supported ICT introduction by many SMEs since the 1990s.

Some examples of these activities are presented below:

- Loyalty point card systems
  The loyalty cards issued by a shopping street mainly aim at earning more consumer loyalty to the shopping street. Loyalty cards are used as tools for collecting customers' data to encourage repeat purchases by giving them points according to the purchase amount and offering them a variety of services and effective sales promotion. Recently, there have been cases where Loyalty cards are used for community currency purposes by, for example, offering customers points for their contribution to the community or the environment.
- Group contracts for credit cards and debit cards
  In shopping streets where there is much use of credit cards by purchasers, a cooperative group contract between member stores and a credit card company is highly advantageous: shopping streets enjoy alternative payment options for consumers and decreased fees for the member stores, while the credit card company benefits from simplified collection processing.
- Launch shopping street website
  Some shopping streets create a website and use it to provide information, mainly for sales promotion purposes. Some of them sell the members' merchandise online In other cases, they use customers' mobile phones as sales tools and display sales promotion coupons on the phones'screens.
- Cooperation with other card systems
  Recently, shopping streets have been increasingly adding their own unique features to existing card systems instead of developing new systems by cooperating with the use of Felica contactless IC cards managed by transportation companies or major retail companies and the basic resident registration IC cards issued by local governments.
- Acceptance of electronic money
  As with credit and debit cards, shopping streets are now accepting electronic money in an effort to increase customer conveniences and get new customers by adding this new means of payment. Electronic money is suited for small-amount payments and has a high affinity for the above-mentioned loyalty cards and transportation IC cards. To cooperate with generally used types of electronic money is very common for these cards recently.

Fig. 8-1 Nakamise Shopping Street in Asakusa, Tokyo, a popular tourist spot in Japan

GS1 Japan will continue research for the use of information technology by SMEs to help community revitalization.

9. OBN (Open Business Network)

Internet construction technology (controlled IP network)

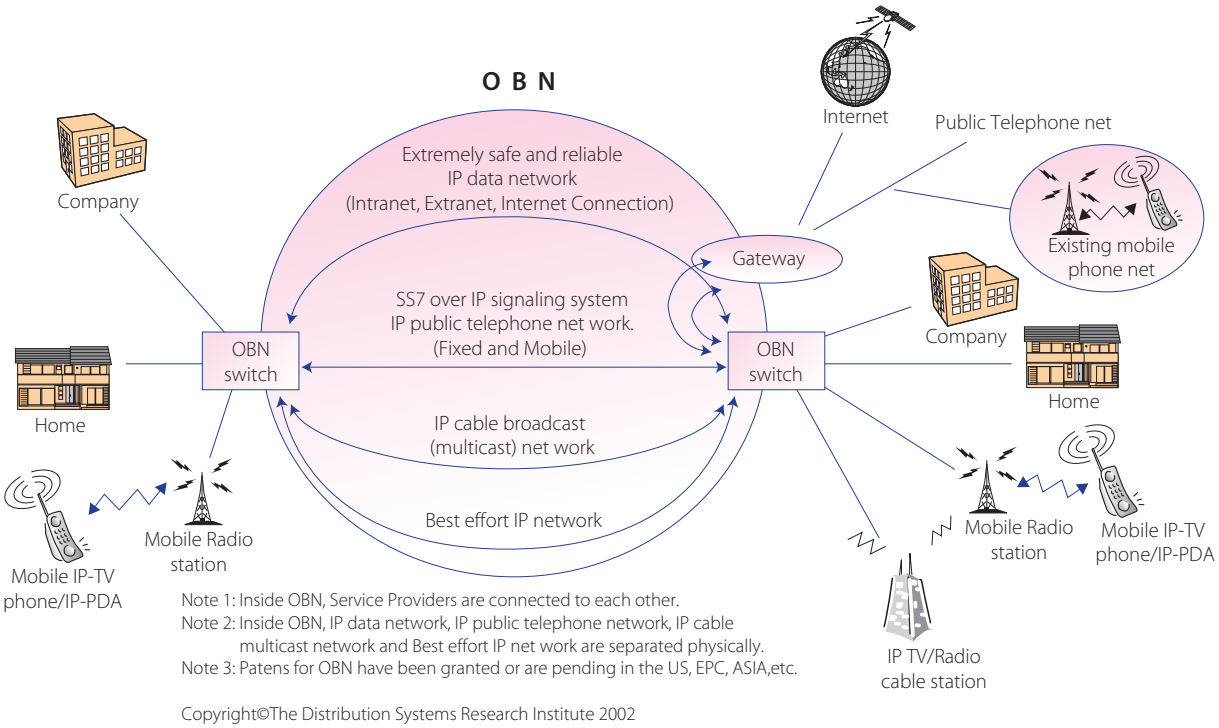
Basic patents that describe the next generation Internet construction technology (IP in IP of virtual network system have been granted in Japan, the United States, and UK. They detail the controlled IP (All IP) network, which is the world's first network that can integrate business data, telephony services, and broadcast type services. OBN (Open Business Network), the only next generation IP network that can offer much higher security and reliability than the present Internet, was developed by The Distribution Systems Research Institute jointly with professor Miyaguchi of Shibaura Institute of Technology, in response to demands of many industrial fields with key interest from the distribution industry.

OBN technology has been licensed to 1 carrier, NTT Communications Corporation, who began to offer commercial OBN service from May and August of 1999, respectively.

Due to its high level of security and reliability, OBN has been adopted as the Intranet and Extranet of the Japanese Defense CALS and Electronic Settlement of Credit Card or Electronic Money. It is spreading widely among distribution companies as well as fields such as manufacturing and finance.

Fig. 9-1 First in the World to Complete the Basic Communication Technology for First ALL-IP Network (Controlled IP Network)

— Integrating all IP Data Networks (Intranet/ Extranet/Internet connection), Mobile and Fixed public IP telephone Networks and IP multicast Cable TV and Radio broadcast networks within the extremely safe and reliable OBN —



Note 1: Inside OBN, Service Providers are connected to each other.
Note 2: Inside OBN, IP data network, IP public telephone network, IP cable multicast network and Best effort IP net work are separated physically.
Note 3: Patens for OBN have been granted or are pending in the US, EPC, ASIA,etc.

E-Mail: info@obn.dsri.jp
URL: http://www.obn.dsri.jp

10. User Support

10.1 Promotional and Educational Activities, Seminars & Consultation

GS1 Japan holds seminars covering a wide range of topics such as the GS1 System, Product Catalogue (JICFS/IF-DB), EDI, and EPCglobal for promotional and education purposes, and these events are well attended.

GS1 Japan also organizes a special seminar in January of each year to which executives of major retailers and wholesalers are invited as lecturers.

GS1 Japan also holds the Barcode Basic Course, an introductory course on barcodes, once or twice a month in Tokyo and Osaka and several times a year in other regional cities. These courses have proven popular with participants. In particular, the barcode introductory course has attracted a large number of participants from companies seeking to acquire a company prefix as well as from solution providers. The total number of participants attending in 2009 came to about 1,500. Starting in July 2010, participants can try scanning various barcodes.

Fig. 10.1-1 Barcode Basic Course

Fig. 10.1-2 Barcode Scanning Experience

In April 2009, GS1 Japan started giving an introductory course on EPC/RFID for potential users. This course has since been held every two months and gives instructions mainly on the characteristics of RFID tags, case studies and EPCglobal Standards. In addition to lectures, the course also features demonstrations of bulk reading of EPC Gen2 tags on the carton boxes on the assumption that actual inspection of goods for delivery and shipment. Participants can also experience actual EPC Gen2 tag reading at the corner of the class room.

Fig. 10.1-3 Introductory course on EPC RFID

Fig. 10.1-4 RFID tag reading experience

In April 2010, GS1 Healthcare Japan started holding seminars on barcode use for pharmaceutical manufacturers, medical equipment manufacturers, wholesalers, hospital staff and solution providers to provide them with explanations on the compulsory labeling of the GS1-128 bar codes as directed by the Ministry of Health, Labour and Welfare.

GS1 Japan also offers free consultation services on a range of topics including item code registration and utilization, the printing of symbols, GTIN/GLN allocation rules, EDI and EPCglobal standards.

10.2 Publications

To provide information to interested parties, GS1 Japan publishes various printed materials on topics relating to the operation of the GS1 System and on the achievements of SCM-related case studies in Japan.

The following is just a sample of the guidelines (in Japanese only) currently available.

- Trends of Supply Chain Information Systems in Japan 2010-2011
- GS1-128 Guide: Application Identifiers and their Applications
- Basics of Barcode System
- GS1-128 Barcode Standardization Operation Reference Manual for Product Codes of Medical Equipment

In addition, GS1 Japan has been publishing the *Ryutsu* (*1) *and Systems Review* four times a year since 1974 and the *GS1 Japan Newsletter* six times a year since 1982. These periodicals introduce case studies and investigations on such topics as POS systems, EDI, SCM, bar code systems, RFID electronic tags, EPCglobal and other advanced logistics systems, standardization trends and approaches taken by industry, and the current state of global standard introduction.

GS1 Japan also produces videos and CDs about the basics of the GS1 System which are used in the seminars referred to above. We lend them free of charge.

Fig 10.2-1 Basics of Barcode System

Fig. 10.2-2 Ryutsu and Systems Review

*1 Ryutsu
Ryutsu is Japanese equivalent of supply and demand chain, typically consists of three groups; Manufacturers, Wholesalers and Retailers.

11. The History of GS1 Japan

11.1 Overview

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

In the second half of the 1970s, GS1 Japan paved a way to adopt EAN system in Japan, starting with the introduction of EAN symbols into the Japanese Industrial Standards (JIS). Source marking was tested with cooperation from Kikkoman Corporation (a soy sauce manufacturer), Coca-Cola Japan, Kai Corporation (a cutlery manufacturer), while retailers began to conduct storefront experiments with POS system. In the 1980s, Jusco Co., Ltd. (present AEON Co., Ltd.), Co-op supermarket stores and other retailers conducted pilots on the POS system. GS1 Japan held many seminars on EAN system and POS system throughout Japan and encouraged stakeholders to adopt source marking.

The important milestone for the widespread use of source marking was the fact that, in 1982, Seven-Eleven Japan, a convenience store chain, adopted POS system at all of its stores (which totaled 1,650 at that time, but are about 12,800 at present). Another factor contributing to the diffusion of POS system was the introduction of consumption tax in 1989.

GS1 Japan created study groups for several industries in the 1980s and worked together with these industries to study how to improve their business process using computer systems. These industries included processed foods, sporting goods, consumer electronics, and books and magazines. A study group of wholesalers was also established by organizing representatives from different industries. These study groups soon came to cooperate in the adoption of EAN standards.

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

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

In the 2000s a new business model was established in Japan in which convenience stores acted as agencies for receiving public utility payments from customers. As the tool for realizing this service, the GS1-128 was adopted on the bills for the public utility charges.
And the meat industry also decided to adopt the GS1-128 for its standard labels for traceability.
The second half of 2000s was characterized by the fact that the GTIN began to be used for the online music service, an intangible product, and that Internet and mail order companies started to adopt the GTIN for their product management purposes.

During the 2003-2009 period, GS1 Japan founded EPCglobal Japan and worked to solve the problems of introducing RFIDs 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 XML-format EDI standard (Ryutsu BMS) for supporting domestic business practices and has worked to spread the standard together with 45 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.

11.2 Chronology

1972	DSRI (Distribution Systems Research Institute) established.
1973	Supply chain information network models developed.
	"Ryutsu 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 Industrial 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 Japanese 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 started.

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.
	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 Industrial 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.
	Pilot for utilization of GS1 Data Bar in supermarkets
2010	Mobile Day Seminar held in Tokyo
	FDA UDI for Medical Devices Seminar in Tokyo

12. Reference

12.1 Structure and Aspects of Japanese Supply Chain

It has generally been said that supply chain in Japan are characterized by lengthy, complicated and low productivity. Post-war studies described the features of traditional supply chain in Japan as being small-scale, excessive, family-style businesses with low productivity. The studies also noted pre-modern retailing features and the existence of too many stages between production and retailing for wholesaling, such as secondary, tertiary and other wholesaler levels.

12.1.1 Recent developments

In the past 30 years, however, supply chain in Japan has changed greatly. The following factors are considered to be among those contributing to changes.

First, changes in industrial structures, which include the deindustrialization of Japanese manufacturers resulting from the movement offshore of secondary industries to foreign countries with lower labor costs as well as increasing imports due to a strong yen, which led to the decline of competitive domestic manufacturing areas, especially in regional industries.

Second, there have been changes in population dynamics. As a result of declining birthrates and an aging population, Japan has been experiencing changes in its population structure at a very rapid pace that has not been seen in other countries. Trends in consumption also changed at the same time.

Also there were the growth of large-scale retailers and changes in major business types. While family-run small-scale businesses have decreased substantially, large-scale companies have grown even larger. Moreover, while department stores and GMSs (general merchandise stores) used to be the main large-scale businesses in the past, recently drugstores, mass merchandisers of consumer electronics, fast fashion stores and other retailer chains have enjoyed high growth. Most of these types of business have been increasing their sales through low pricing.

In addition, the centers of commerce have shifted from city centers to the suburbs. In 2000, the so-called three laws related to community development, that is, the Act on Measures by Large-Scale Retail Stores for Preservation of the Living Environment, the City Planning Act and the Act on Vitalization in City Centers, were enforced. These laws deregulated the opening of new stores and accelerated the construction of large-scale retail stores in the suburbs where legal controls were less strict, which resulted in the decline in commerce in city centers.

12.1.2 Statistics of recent trends

First let's look at the general situation of wholesalers and retailers in Japan (Table 12.2-1 Summary of the Commerce Statistics). During the 2004–2007 period, the number of wholesalers decreased 10.9% and retailers decreased 8.2%, resulting in an average decline of 8.8% for wholesalers and retailers combined. The number of employees fell by 6.8% for wholesalers and 2.2% for retailers, amounting to a drop of 3.7% for both business types. The annual sales of merchandise decreased 1.3% for wholesalers and 1.0% for retailers, with an average combined decrease of 1.2%.

Next let's consider the situation by number of employees (Table 12.2-2 Number of Japanese Retailers and Wholesalers by the Number of Employees). In the 2004–2007 period, the number of employees decreased at wholesalers of all sizes. The decrease was especially marked at all small-scale wholesalers with 20 employees or less: by 10.8% for wholesalers with one to two employees, by 12.7% for those with two to four employees, by 12.0% for those with five to nine employees, and by 9.7% for those with 10 to 19 employees. For retailers, those with one to two employees decreased staff by 11.5% and those with two to four employees, by 11.1%. In general, the decrease was sharpest in family-run small retailers.

For wholesalers, the merger of large wholesalers and decreases in small-scale businesses, which had existed as secondary, tertiary and other regional wholesalers, can be cited as the factors behind these trends. For retailers, the main cause was the closing of small stores due mainly to competition from large retailers, aging shop owners and the difficulty of finding successors. However, the ratio of small retailers is high even at present, with 44.3% of employees at retailers working at small retailers with one to two employees. If these employees were added to the number of employees at retailers with three to four employees, it would indicate that two-thirds of all retailer employees are hired by small-scale retailers. The ratio of employees at large retail stores with 100 or more staff is only 0.4% of the total retailer workers.

By type of business (Table 12.2-3 Number and Sales of Retail Stores by Type of Business), department stores and GMSs suffered decreases both in the number of stores and annual merchandise sales. By contrast, the apparel stores achieved high growth of nearly 20% in the number of stores and 9% in sales. Drugstores also enjoyed a considerable 16.4% increase in sales, although their store numbers dropped.

In the case of large-scale wholesalers (Table 12.2-4 Top 20 Wholesale Companies in Japan), the sales of the top three drug wholesalers have been firm, partly supported by the good performance of drugstores as noted above.

For large retailers (Table 12.2-5 Top 20 Retail Companies in Japan), new mass merchandisers of consumer electronics such as Yamada Denki and Bic Camera, and Uniqlo, a fast fashion company, are among the retailers that have been achieving rapid growth in a business environment in which GMSs and many other retailers have faced difficulties.

Similarly, the sales of department stores have fallen for all articles except food. In particular, the sales of women's clothing and accessories, though it had accounted for half of department store clothing sales which was almost 40% of their total proceeds, have dropped, greatly contributing to the overall decrease in their revenues (Table 12.2-7 Sales by Type of Merchandise in Department Stores).

12.2. Statistics on Japanese Retail Industry

Table12.2-1 Summary of the Commerce Statistics

Industrial Category	2004	2007	2004/2007 Growth (%)
Total No. of stores	1,613,318	1,470,995	-8.8
Wholesalers	375,269	334,240	-10.9
Retailers	1,238,049	1,136,755	-8.2
Total No. of employees	11,565,953	11,133,882	-3.7
Wholesalers	3,803,652	3,544,507	-6.8
Retailers	7,762,301	7,589,375	-2.2
Total of Annual Sales (¥Million)	538,775,810	545,250,569	1.2
Wholesalers	405,497,180	410,678,894	1.3
Retailers	133,278,631	134,571,675	1.0

The source : METI (Ministry of Economy, Trade and Industry) "The Census for Commerce" 2007

Table12.2-2 Number of Japanese Retailers and Wholesalers by the number of Employees

Industry	Number of employees	2004	2007	2007 Composition Ratio (%)	2004/2007 Growth (%)
Wholesale Trade	1 - 2	86,429	77,132	23.1	-10.8
	3 - 4	89,706	78,316	23.4	-12.7
	5 - 9	102,908	90,552	27.1	-12.0
	10 - 19	57,343	51,959	15.5	-9.4
	20 - 29	17,587	16,216	4.9	-7.8
	30 - 49	12,003	11,257	3.4	-6.2
	(Subtotal)	365,976	325,432	97.4	-11.1
	50 - 99	6,459	6,069	1.8	-6.0
	100 -	2,834	2,739	0.8	-3.4
	(Subtotal)	9,293	8,808	2.6	-5.2
	Total	**375,269**	**334,240**	**100.0**	**-10.9**
Retail Trade	1 - 2	568,816	503,512	44.3	-11.5
	3 - 4	284,060	252,478	22.2	-11.1
	5 - 9	207,674	201,585	17.7	-2.9
	10 - 19	112,380	114,041	10.0	1.5
	20 - 29	32,696	32,301	2.8	-1.2
	30 - 49	17,477	17,208	1.5	-1.5
	(Subtotal)	1,223,103	1,121,125	98.6	-8.3
	50 - 99	10,437	10,854	1.0	4.0
	100 -	4,509	4,776	0.4	5.9
	(Subtotal)	14,946	15,630	1.4	4.6
	Total	**1,238,049**	**1,136,755**	**100.0**	**-8.2**

The source : METI (Ministry of Economy, Trade and Industry) "The Census for Commerce" 2007

Table12.2-3 Number and sales of Retail Stores by Type of Business

Type of Stores	Total No. of stores in 2004	Total No. of stores in 2007	04/07 Growth (%)	2004 Sales ¥Million	2007 Sales ¥Million	04/07 Growth (%)
Total	1,238,049	1,137,859	-8.1	133,278,631	134,705,448	1.1
Department stores	308	271	-12.0	8,002,348	7,708,768	-3.7
[1] Large Department stores	276	247	-10.5	7,668,578	7,323,980	-4.5
[2] Other Department stores	32	24	-25.0	333,770	384,789	15.3
General Supermarkets	1,675	1,585	-5.4	8,406,380	7,446,736	-11.4
[1] Large supermarkets	1,496	1,380	-7.8	7,949,605	6,947,294	-12.6
[2] Medium supermarkets	179	205	14.5	456,775	499,442	9.3
Specialty supermarkets	36,220	35,512	-2.0	24,101,939	23,796,085	-1.3
[1] Apparel	5,991	7,153	19.4	1,544,556	1,680,800	8.8
[2] Grocery	18,485	17,865	-3.4	17,046,994	17,106,265	0.3
[3] Homefurnishing	11,744	10,494	-10.6	5,510,389	5,009,020	-9.1
Convenience Stores	42,738	43,684	2.2	6,922,202	7,006,872	1.2
Drugstore	13,095	12,701	-3.0	2,587,834	3,012,637	16.4
Other supermarkets	56,211	55,615	-1.1	5,480,581	5,949,303	8.6
Specialty stores	726,825	694,578	-4.4	49,970,253	53,929,117	7.9
[1] Apparel stores	95,497	94,954	-0.6	3,972,502	4,074,004	2.6
[2] Grocery stores	190,788	176,575	-7.4	7,023,157	7,218,837	2.8
[3] Homefurnishing stores	440,540	423,049	-4.0	38,974,594	42,636,275	9.4
Other retail stores	360,977	293,913	-18.6	27,807,094	25,855,930	-7.0

The source: METI (Ministry of Economy, Trade and Industry) "The Census for Commerce" 2007

Table 12.2-4 Top 20 Wholesale Companies in Japan

(As of 2008)

2008	2007	Company Name	Location of Head Office	Annual sales (¥Million)	Annual Growth (%)	Business Line
1	1	Mediceo Paltac Holdings	Tokyo	2,463,569	9.3	Drugs
2	2	Alfresa Holdings	Tokyo	1,934,868	9.3	Drugs
3	3	Suzuken	Aichi	1,641,331	3.4	Drugs
4	4	Kokubu	Tokyo	1,471,545	3.1	Grocery
5	5	Ryoshoku	Tokyo	1,402,308	0.2	Grocery
6	6	Nippon Access	Tokyo	1,367,782	1.9	Grocery
7	7	Toho Holdings	Tokyo	838,903	4.2	Drugs
8	8	Nihon Shuppan Hanbai	Tokyo	770,040	2.3	Books/Audio/Video/Music Instruments
9	10	Kato Sangyo	Hyogo	641,527	-2.3	Grocery
10	11	Itochu Shokuhin	Osaka	604,737	6.7	Grocery
11	9	Tohan	Tokyo	583,537	3.8	Books/Audio/Video/Music Instruments
12	12	Arata	Chiba	569,867	-6.8	Sundry goods/Medical Supplies
13	14	Nihon Shurui Hanbai	Tokyo	502,736	3.3	Grocery
14	13	Mitsui Foods	Tokyo	501,294	4.5	Grocery
15	15	Forest Holdings	Oita	388,873	-5.1	Drugs
16	18	Asahi Shokuhin	Kochi	360,876	5.8	Grocery
17	16	MEIDI-YA	Tokyo	344,071	-4.0	Grocery
18	17	World	Hyogo	342,758	-4.3	Textile
19	19	Food Service Network	Tokyo	314,550	1.4	Grocery
20	21	Vital KSK Holdings	Tokyo	271,076	-4.2	Textile

The source: The Nikkei Marketing Journal

Table 12.2-5 Top 20 Retail Companies in Japan

(As of 2008)

2008	2007	Company Name	Type of business	Location of Head office	Annual sales (¥Million)	Growth (%)
1	1	Seven & I Holdings	Holding Co.	Tokyo	5,649,914	-1.8
2	2	Aeon	Holding Co.	Chiba	5,230,896	1.2
*	*	Aeon Retail	Supermarket	Chiba	2,034,973	-
3	3	Yamada Denki	Specialty store	Gunma	1,871,828	5.9
*	*	Ito-Yokado	Supermarket	Tokyo	1,462,719	-1.8
4	*	Isetan Mitsukoshi Holdings	Holding Co.	Tokyo	1,426,684	-
5	4	Uny	Supermarket	Aichi	1,910,247	-2.1
6	7	J. Front Retailing	Holding Co.	Tokyo	1,096,690	7.9
7	5	Daiei	Supermarket	Tokyo	1,040,850	-13.0
8	6	Takashimaya	Department store	Osaka	976,116	-6.4
9	8	edion	Holding Co.	Osaka	803,004	-5.7
10	9	Yodobashil-Camera	Specialty store	Tokyo	701,277	-1.5
*	*	Mitsukoshi	Department store	Tokyo	669,049	-
11	11	Bic Camera	Specialty store	Tokyo	630,740	11.5
12	12	Fast Retailing	Holding Co.	Yamaguchi	586,451	11.7
13	10	K's Holdings	Specialty store	Ibaraki	574,188	1.1
*	*	7-11 Japan	Convenience Store	Tokyo	540,773	2.5
14	15	H2O Retailing	Holding Co.	Osaka	509,525	8.0
15	16	Izumi	Supermarket	Hiroshima	500,293	6.3
*	*	Sogo	Department store	Osaka	482,144	-4.0
16	17	Life Corporation	Supermarket	Osaka	462,967	5.3
*	*	UNICLO	Specialty store	Yamaguchi	462,343	8.9
17	13	Kojima	Specialty store	Tochigi	459,840	-8.1
*	*	Daimaru	Department store	Osaka	453,454	-5.9
*	*	Seibu	Department store	Tokyo	450,698	-3.7
18	14	Marui Group	Holding Co.	Tokyo	447,399	-9.3
*	*	Isetan	Department store	Tokyo	434,431	-7.2
19	21	DCM Japan Holdings	Holding Co.	Tokyo	426,552	7.8
20	18	Heiwado	Supermarket	Shiga	412,213	-2.1

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

The source: The Nikkei Marketing Journal

Table 12.2-6 Top 10 Convenience Store Chains in Japan

(As of 2008)

2008	2007	Name of stores	Location of Head Office	Group	Annual sales (¥Million)	No. of stores
1	1	Seven-Eleven Japan	Tokyo	Seven & I Holdings	2,762,557	12,298
2	2	Lawson	Tokyo	Mitsubishi	1,557,781	9,527
3	3	Family Mart	Tokyo	Itochu Group	1,334,048	7,404
4	4	Circle K Sankus	Tokyo	Uny	1,095,201	6,166
5	5	Ministop	Chiba	Aeon	302,911	1,772
6	6	Daily Yamazaki	Chiba	Yamazaki Baking	222,875	1,647
7	8	Seicomart	Hokkaido	Independent	159,804	1,040
8	7	am/pm	Tokyo	Rex Holdings	195,599	1,129
9	9	Three F	Kanagawa	Independent	122,313	712
10	10	Poplar	Hiroshima	Independent	104,768	701

The source: The Nikkei Marketing Journal

Table 12.2-7 Sales by type of merchandise in department stores

(As of 2008)

	Total sales (¥Million)	%
Total sales	7,381,363	100.00%
Apparel	2,713,304	36.76%
Accessories	936,476	12.69%
Household goods	368,591	4.99%
Grocery	1,925,252	26.08%
Restaurant	202,493	2.74%
Sundry goods	1,048,746	14.21%
Service	73,234	0.99%
Others	113,267	1.53%
(Shopping gift cards) *	(278,962)	—

(*The sales of shopping gift cards are not included in the total sales.)

The source: Japan Department Stores Association

Table 12.2-8 Sales by type of merchandise in chain stores

(As of May 2010)

	Total sales (¥Million)	%
Total sales	1,020,454	100.00%
Grocery	636,661	62.39%
Apparel	110,218	10.80%
Sundry goods	87,801	8.60%
Drugs & Cosmetics	32,902	3.22%
Furniture & Homefurnishing	36,768	3.60%
Home electrical apparatus	10,591	1.04%
Other living goods	41,428	4.06%
Service	3,468	0.34%
Others	60,617	5.94%

The source: Japan Chain Stores Association

(62 member companies and 7,852 stores)

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