



The Global Language of Business



GS1 Japan Handbook

2020-2021

Message from the President

GS1 Japan was established in 1972 as a specialised institution for the rationalisation and standardisation of distribution systems, and has since worked to promote the introduction of various distribution standards and their application systems. Since we joined GS1 (then called EAN) in 1978, as the representative of Japan, we have been encouraging the use of GS1 standards such as GTIN. (Refer to 4.3)

In addition to the standardisation activities above, GS1 Japan has also been providing various services, such as Ryutsu BMS (the Internet-based standard EDI messages for Japanese retailers and wholesalers, Refer to 2.6) and GJDB (GS1 Japan Data Bank, Refer to 2.2). GJDB was launched in October 2019 with the primary purpose of helping GS1 Company Prefix licensees (brand owners) in Japan to easily compose GTINs and manage their own product information. Number of parties have already started utilising this service. GJDB is a system that takes into account GS1's global policies, such as its linkage to the GS1 Registry Platform. GS1 Japan will further enhance its services in response to the digitalisation of the distribution industry.

We are also promoting the use of GS1 standards in the healthcare sector. GS1 Japan, healthcare industry and the government have been working together to ensure patient safety as well as supply chain efficiency, resulting in the source marking of GS1 standard barcodes on almost all prescription drugs and medical devices. Stimulating the standardised use of RFID tags through domestic business organisations is one of our major activities. The use of RFID tags is rapidly expanding, particularly in the apparel industry, mainly for receiving/shipping operations and inventory management. Recently, RFIDs have begun to be used for checkout operations, including automatic settlement at self-checkout machines. In addition, we are encouraging the use of RFID tags in other industries/applications, including the application for medical device identification. By sharing the detailed event data of each product and object collected through the standardised use of RFID tags and other equivalents, it is expected that the data could be applied for traceability and marketing purposes. .

Furthermore, in order to support member companies and interested parties, we have launched the 'GS1 AIDC Standards Self-Declaration of Conformity Service' (Refer to 2.1) this year to provide an opportunity for companies to promote their products that support GS1 standards. GS1 Japan will continue to support their businesses and initiatives.

At present, the world is facing an unprecedented crisis due to COVID-19 infection. The adverse economic effects are becoming worse than financial crisis in 2008. Even in Japan, the traditional business models have become bogged down due to factors such as the decrease in inbound and domestic customer visits. In the distribution industry, efforts are being made to properly deal with the changes in the business environment triggered by the spread of COVID-19 infection, such as improving operational efficiency through the active use of ICT and attracting new customers through the Internet utilisation.



In addition, there is a growing movement to realise the digital transformation throughout the distribution industry taking this difficult situation positive. GS1 Japan is doing its utmost to support Japanese companies in order for them to overcome this difficult situation by building a distribution system that can be adapted to the new environment through further active use of GS1 identification keys, data carriers, and databases.

GS1 Japan contributes to a secure and convenient future through the 'standardisation' of codes and rules as a common platform for society.

MUKAE Yoichi

President

GS1 Japan

Table of Contents

| | |
|--|-----------|
| Message from the President | i |
| Table of Contentst | ii |
| 1. Sectors (Use Cases) | 1 |
| 1.1 Retail and CPG | 1 |
| 1.1.1 Promoting GTIN Application for Professional Use Products: Managing Indirect Materials for Factories ----- | 1 |
| 1.2 Healthcare | 2 |
| 1.2.1 Utilisation of GS1 Barcodes at Retail Pharmacies ----- | 2 |
| 1.2.2 GS1 Barcodes Utilisation in Distribution Centres of the Pharmaceutical Wholesaler, MEDICEO ----- | 3 |
| 1.2.3 Johnson & Johnson to Take Advantage of RFID ----- | 5 |
| 1.3 Transport & Logistics | 7 |
| 1.3.1 Asset Management of Drums Using EPC/RFID at Fukushima Canon ----- | 7 |
| 1.4 B2C | 9 |
| 1.4.1 GTINs for Product Search at EC Mall ----- | 9 |
| 1.4.2 GS1 QR Code Utilised Advanced Approach for B2B2C Services ----- | 11 |
| Column: EPC/RFID (Electronic Tag) Current Picture in Japan | 14 |
| 2. Services and Solutions | 17 |
| 2.1 GS1 AIDC Standards Conformity Check Guide and GS1 AIDC Standards Self-Declaration of Conformity Service Launched | 17 |
| 2.1.1 Outline of GS1 AIDC Standards Conformity Check Guide ----- | 17 |
| 2.1.2 Launch of GS1 AIDC Standards Self-Declaration of Conformity Service and Publication of List of GS1 AIDC Standards Self-Declared Conforming Products ----- | 18 |
| 2.1.3 Product List Outline ----- | 18 |
| 2.1.4 Supporting Activities Promoting GS1 Standards Correct Usages ----- | 19 |
| 2.2 GS1 Japan Data Bank (GJDB) | 19 |
| 2.2.1 Challenges Related to Product Information in Japan ----- | 19 |
| 2.2.2 Functions GJDB Offers ----- | 20 |
| 2.2.3 Number of Items Registered in GJDB ----- | 22 |
| 2.2.4 GJDB Update History Information ----- | 22 |
| 2.2.5 Future of GJDB ----- | 22 |
| 2.3 JICFS/IFDB (JAN Item Code File Service/Integrated Flexible Data Base) ... | 22 |
| 2.4 GEPIR | 24 |
| 2.5 GPC Translation and OECD Product Recall portal | 24 |
| 2.6 Ryutsu BMS (Business Message Standards) | 25 |
| 2.6.1 Development of Ryutsu BMS ----- | 25 |
| 2.6.2 Outline of Ryutsu BMS ----- | 26 |
| 2.6.3 Efforts to Promote Ryutsu BMS ----- | 27 |
| 2.6.4 Users' Commitments to Ryutsu BMS ----- | 27 |
| 2.7 Multilingual Product Information Service | 28 |
| 2.7.1 Background and Objectives ----- | 28 |
| 2.7.2 Service Overview ----- | 28 |
| 2.7.3 Expected Results ----- | 29 |
| 2.7.4 Future Plan ----- | 29 |

| | |
|--|-----------|
| 3. Community Engagement and Standard Implement | 30 |
| 3.1 GS1 Japan Partners | 30 |
| 3.2 Supply Chain Standards Management and Promotion Council | 31 |
| 3.2.1 Organisational Structure | 31 |
| 3.2.2 Activities for Promotion and Increasing Adoption | 31 |
| 3.2.3 Registration of Ryutsu BMS Trademark | 31 |
| 3.3 GS1 Healthcare Japan | 32 |
| 3.3.1 Activities | 32 |
| 3.3.2 Activity of Each Work Group | 32 |
| 3.3.3 Topics in 2019/20 | 32 |
| 3.4 ICT-Oriented Wholesale Industry Study Group | 32 |
| 3.5 The Collaborative Council of Manufacturers, Wholesalers, and Retailers | 34 |
| 3.6 Study Group for Information Systems in Food, Beverage, and Alcohol Industry | 35 |
| 3.7 Supports and Trainings | 35 |
| 3.7.1 Introduction to Barcodes | 35 |
| 3.7.2 Introduction to EPC/RFID | 35 |
| 3.7.3 Introduction and Implementation of Ryutsu BMS | 36 |
| 3.7.4 Introduction to Barcode for Prescription Drugs and Medical Devices | 36 |
| 3.7.5 Junior Job Shadowing | 36 |
| 3.8 Publications and PR Tools to Promote GS1 Standards | 36 |
| 3.8.1 Guidelines | 36 |
| 3.8.2 Periodical Publications | 37 |
| 3.8.3 Videos and Mobile App 'GS1 Japan Scan' | 38 |
| 3.9 Events | 38 |
| 3.9.1 GS1 Japan Annual Seminar | 38 |
| 3.9.2 GS1 B2C (Mobile) Seminar | 38 |
| 3.9.3 EPC RFID FORUM | 39 |
| 3.9.4 RETAILTECH JAPAN 2019 | 39 |
| 4. About GS1 Japan | 40 |
| 4.1 Overview | 40 |
| 4.1.1 EPC/RFID | 40 |
| 4.1.2 Healthcare | 41 |
| 4.1.3 New Developments | 41 |
| 4.2 GS1 Japan in Brief | 41 |
| 4.3 History | 42 |
| 5. References | 44 |
| 5.1 Statistics on Japanese Retail Industry | 44 |

1. Sectors (Use Cases)

1.1 Retail and CPG

1.1.1 Promoting GTIN Application for Professional Use Products: Managing Indirect Materials for Factories

In the consumer goods sector, barcodes are increasingly being used for POS and product inspection works, and GTINs are being used for a variety of purposes, including ordering and product identification over the Internet. On the other hand, GTIN source marking has not yet become sufficiently popular in the professional-use sector. Under these circumstances, companies, achieving efficient product management utilising GTINs, are gradually increasing.

MonotaRO Co.,Ltd. (MonotaRO), which sells indirect materials for factories to businesses, is one such company. This company uses GTINs mainly for product management at its distribution centres.

MonotaRO is a company that sells products mainly to businesses through online stores and catalogues. They handle a myriad number of products, approximately 18 million (as of the end of May 2020) from a wide range of categories. Its remarkable broad product categories cover indirect materials such as tools, screws, bolts and many others for factory use, office supplies, store supplies, agricultural materials, and healthcare/nursing care products.

Most of the products handled by MonotaRO are stocked at the suppliers and directly delivered from the suppliers or delivered via MonotaRO's delivery facilities, but the hot-selling products are stocked and managed at MonotaRO's logistics centres where the products are managed utilising EAN/UPC symbols on them. MonotaRO is also offering its own brand products which have been source marked with GTIN, thus both purchased and own brand products are to be managed utilising GTINs.

The business processes from receipt to shipment of products are as follows.

(i) Inspecting Receiving Products

On receiving the products, product data needed for inspection are retrieved by the handy terminals. And then, they conduct receiving inspection capturing product EAN/UPC symbol and counting the number.

When the inspection is completed, they attach a stock label on the product accordingly by type of product. Stock labels indicate both the shelf location number and eight-digit in-house product management code by barcodes. If the EAN/UPC

symbol is missing on the product, inspection is done manually and barcode label encoded with an in-house code is printed and attached to each product after the receiving inspection.

(ii) Warehousing

Product storage shelves are identified with QR code indicating the location number. The warehousing operation is done by checking the EAN/UPC symbol and the barcode of the shelf location number attached to the product against the QR code of the shelf location number at product storage shelves. (In-house code is checked, if the product does not have the EAN/UPC symbol.)

(iii) Picking

When picking products, two symbols, target product EAN/UPC symbol and barcode for shipping container identification, are scanned. Above series of scanning will indicate which product should be loaded to which container. Each picking instruction is issued as a batch for multiple customer destination, and they are sorted by each customer in the next step.

(iv) Sorting-by-customer and Packing for Shipment

The shipping containers, which are in the 'sorting-by-customer' area and are individually prepared for each customer destination, have a built-in lamp to notify their locations mounted in the lower position. When a barcode of shipping container is scanned, the corresponding customer container lamp lights up to show to which container the products need to be put. Warehouse workers just need to scan the EAN/UPC symbol and put the products into the container with its lamp lit, and then put the lamp off.

When the product sorting is finished, they print delivery slip and invoice, and then sort those slips. Slips are also labelled with barcodes, and same as the barcode on the product, target container for slips is indicated with the lamp. The container is forwarded to packing lane after sorting by the customer is completed. There are separate packing lanes for different size of cardboard box, and each box is sorted to target lane by its size. The box sizes are automatically calculated using the product sizes registered in the product master data.

1. Sectors (Use Cases)

In this manner, while scanning EAN/UPC symbols at each process in the logistic centres, MonotaRO streamlined the mass incoming and outgoing product inspection, and then realised highly accurate stock management of a variety of products.

In addition to the above-mentioned tasks of verifying products from receipt to shipment, they also scan the EAN/UPC symbols to manage products in the inventory movement work within the warehouse and the semi-annual inventory work.

Indirect materials for businesses have a wide range of categories and many types of products, thus product confirmation and inventory management tend to be cumbersome. Therefore, it can be advised that GTIN utilisation is highly beneficial, especially for such applications. In 2015, GS1 Japan created and published **GTIN source marking guide**(*1) for consumables and materials used as food packing stuffs and used by retailers. This is to leverage promotion of GS1 source marking implementation not only for consumables but also for business products.

✔ (*1) **GTIN source marking guide**: Food light packaging industry barcode (JAN Symbol and ITF symbol) source marking guide <www.dsri.jp/jan/pdf/wrap_v3.pdf>

Figure 1.1.1-1 MonotaRO's logistics centre (Amagasaki, Hyogo Prefecture)



1.2 Healthcare

1.2.1 Utilisation of GS1 Barcodes at Retail Pharmacies

The barcode marking onto pharmaceuticals have been progressed with GS1 barcodes since the ministry of Health, Labour and Welfare published an implementation guideline for barcode labelling of prescription drugs in 2006. Now the barcoding ratio of primary and secondary packages are almost 100% at a level of GTIN. Particularly, GS1 barcode marking on primary packages are one of the specific feature of Japanese pharmaceuticals, and barcoding has been performed even on blister packs (Figure 1.2.1-1). Moreover from April 2021, the barcoding of lot number and expiration date in addition to GTIN for the secondary and tertiary packages are strongly recommended by the notification of the ministry of Health, Labour and Welfare.

In August 2018, the usage of GS1 barcode in retail pharmacy was surveyed and it found a lot of pharmacies use GS1 barcodes of primary and secondary packages with a wide variety of scenes in pharmacies such as picking, inspection, ordering.

The survey was conducted via web questionnaire directed at retail pharmacies of the members in Nippon pharmacy association. The questionnaire was sent to about 14,000 pharmacies of 300 companies, and 2,743 answers were retrieved. The utilization ratio of primary package's GS1 barcode was 88.1%, and that for secondary package's GS1 barcode was 83.0%. Those numbers were extremely higher than those in hospitals.

The scenes for scanning the GS1 barcodes on the primary packages were listed in Table 1.2.1-1, and the comments when using GS1 barcode were described in Table 1.2.1-2. It found GS1 barcodes were used not only for picking and prescription inspection, but also for ordering and securing traceability. Most of the pharmacists felt that error of picking and dispensing was reduced, and a psychological sense of security was increased.

The use ratio of attribute data (lot number and expiration date) in GS1 barcodes on secondary packages was 50.7%. At the time the survey was

Figure 1.2.1-1 GS1 barcode on primary and secondary package



Table 1.2.1-1 GS1 barcodes scanning scenes for primary packages (multiple answers)

| Scanning scenes | Yes (total=2,743) | Ratio (%) |
|--|-------------------|-----------|
| Picking | 1,587 | 72.8 |
| Checking after picking | 1,087 | 49.9 |
| Filling to picking machine or replenishing stock | 969 | 44.5 |
| Ordering | 899 | 41.3 |
| Checking inventory | 682 | 31.3 |
| Checking incoming | 575 | 26.4 |
| Trading small amount between pharmacies | 286 | 13.1 |
| Filling into pharmacy bag | 262 | 12.0 |
| Managing history (traceability, confirmation of sales to patients, etc.) | 87 | 4.0 |
| Others | 42 | 1.9 |

Table 1.2.1-2 Comments on GS1 barcode use for primary packages (multiple answers)

| Comments on scanning | Yes (total=2,743) | Ratio (%) |
|--|-------------------|-----------|
| Reduced picking errors | 1,836 | 84.3 |
| Provided safe and secure feelings to pharmacists | 1,692 | 77.9 |
| Improved filling and replenishing efficiencies | 623 | 28.6 |
| Reduced dispensing work time | 485 | 22.3 |
| Made record management easier | 362 | 16.6 |
| Reduced patients' complaints | 246 | 11.3 |
| Increased dispensing work time | 238 | 10.9 |
| Additional work | 180 | 8.3 |
| Others | 55 | 2.5 |

conducted, the marking ratio of attribute data in the barcode was not enough. But half of the pharmacies answered that they have already started scanning barcodes (GS1 DataBar Composite) to use the attribute data.

In December 2019, Pharmaceutical and Medical Device Act was revised to ensure safety of patients, and the barcoding for pharmaceuticals and medical devices will be mandatory from December 2022. Under the act, the printing quality and data accuracy of GS1 barcodes are further required, and it is expected to promote their use in medical institutes including pharmacies and hospitals.

This survey was reported in the Journal of Pharmaceutical Machinery and Engineering, vol.29, No.3 54-64, (2020).

1.2.2 GS1 Barcodes Utilisation in Distribution Centres of the Pharmaceutical Wholesaler, MEDICEO

GS1 barcode (GS1-128 or GS1 DataBar) marking onto Japanese prescription drugs has been progressed after the notices had been issued by Ministry of Health Labour and Welfare. The first issue was on the 15th of September 2006 with the purpose of preventing mixed-up, securing traceability, and enhancing logistics efficiencies. Now almost all of prescription drugs have GS1 barcodes on their packages including vials, ampules, and blister packs.

MEDICEO CORPORATION (MEDICEO), a wholesaler of prescription drugs and others, has implemented advanced logistics technologies into each process of their distribution centres to eliminate waste and human error. One of the cornerstones of this sophisticated logistics system is the GS1 barcode. In order to realise quick and accurate information acquisition and product confirmation, they scan the GS1-128 and the GS1 DataBar during receiving inspection, picking check, and packing for shipment.

The workflow is as follows.

1.2.2.1 Receiving Inspection

They use a specific cart system for the receiving inspection. The cart has a laptop PC and a barcode scanner loaded, and system is operated under the wireless environment. This cart system has the advantage of accessibility to the objective packages and pallets which are placed at various places in the facility. When products are delivered from manufacturers, the staff scans the GS1-128 displayed on the tertiary packages like cardboard boxes. The GS1-128 on the tertiary packages of prescription drugs contains information of GTIN, expiration date, batch or lot number, and quantity. In the receiving inspection process, they collate GTIN with the data from the

Figure 1.2.2.1-1 Receiving inspection

1. Sectors (Use Cases)

manufacturer received in advance on their system automatically, and then visually confirm the text of expiration date and batch/lot number on the box with the data from the manufacturer. MEDICEO recognises that products are different if the batch numbers or expiration dates are different from each other, and manages inventory as a group of GTIN + expiration date + batch/lot number.

For first-time-received-products, they measure the size and weight of secondary packages, and take exterior pictures, then register these into their master data. Product sizes are used to determine the best type and necessary number of delivery boxes (10, 20, and 40 liters) for packing for shipment. Product weights and photo images are used for collation during picking process. (Figure 1.2.2.1-1)

1.2.2.2 Picking

Their system determines which items need to be dispensed from their warehouse, referring to the picking instruction data. Cardboard boxes and/or storage trays containing the appropriate products are automatically conveyed from the warehouse, and brought up to the picking area through the conveyor line.

The staff standing in the picking area takes the products out from the transported cardboard boxes and/or storage trays, and put them onto the destination sorter. (Figure 1.2.2.2-1). During this operation, GS1 DataBar symbols on secondary packages are utilised for the product identification.

The staff visually confirms the product referring to the product image displayed on the monitor and scans the GS1 DataBar on the secondary package before loading it on the sorter. They scan GS1 DataBar of each secondary package, regardless of the number and even if they are same products, in order to avoid miscounting. When the staff finishes loading the

necessary number of products on the sorter, the cardboard boxes and/or storage trays containing unpicked products are sent back to the warehouse through the conveyor line. (Figure 1.2.2.2-2)

Figure 1.2.2.2-1 Picking in progress



1.2.2.3 Packing for shipment

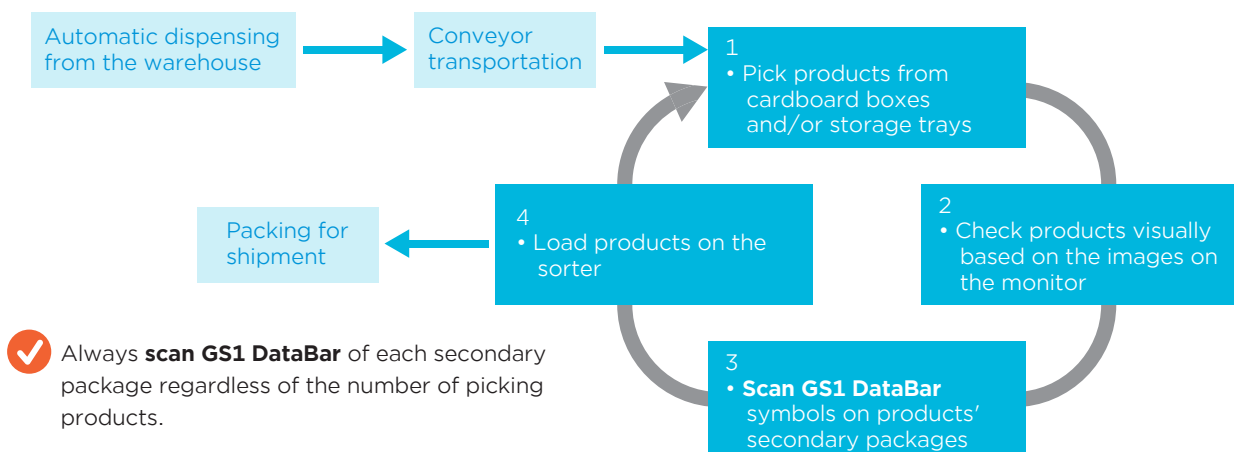
The products loaded on the sorter are automatically conveyed to a sorting chute for each delivery destination.

When all the products to be shipped are transferred to the target sorting chute, the chute number is displayed on the monitor of a mobile packing cart, which has a barcode scanner, a monitor, and a label printer set. (Figure 1.2.2.3-1)

The staff pushes the cart to the designated sorting chute, and scans a barcode on the chute. Then, appropriate delivery box is displayed on the monitor based on the total cubic measure of all the shipping products.

The staff loads the specified delivery box on the cart. A SCM (Shipping Carton Making) label is printed out from the label printer set, and stuck on the box.

Figure 1.2.2.2-2 Picking flow



After that, GS1 DataBar on each product's secondary package in the chute is scanned. And the staff confirms, all products are put in the delivery box correctly and packs it.

Figure 1.2.2.3-1 Packing for shipment



Furthermore, a video camera is mounted on the upper part of the packing cart for recording pictures of inside the delivering boxes during product packing.

This is for securing traceability, and also used for confirmation once the missing or damaged product is reported.

MEDICEO utilises not only GS1 barcodes but also electronic scales, RFID and other techniques. As a result, the accuracy of prescription drug delivery to medical institutions by them achieved 99.9997%.

1.2.3 Johnson & Johnson to Take Advantage of RFID

There are many implant materials in types and sizes used in the surgeries, thus, for medical device manufacturers, the management of these materials is not so easy. Some medical device manufacturers have recently employed GS1 standard complying RFID for

more accurate and efficient implant material management. Here is one of the use cases of the RFID tags for implant materials.

1.2.3.1 Overview

Implant materials such as artificial joints and bone replacement materials, even if they are the same type of the product, have in several sizes for the best fit selections accordingly with each patient. Since it is impossible to foresee which size may be fitted to the patient until actual surgery is conducted, suppliers usually deliver the multiple sizes of the devices in a set box. Unused individual items are returned to the manufacturer in the original set box and only the used items are billed.

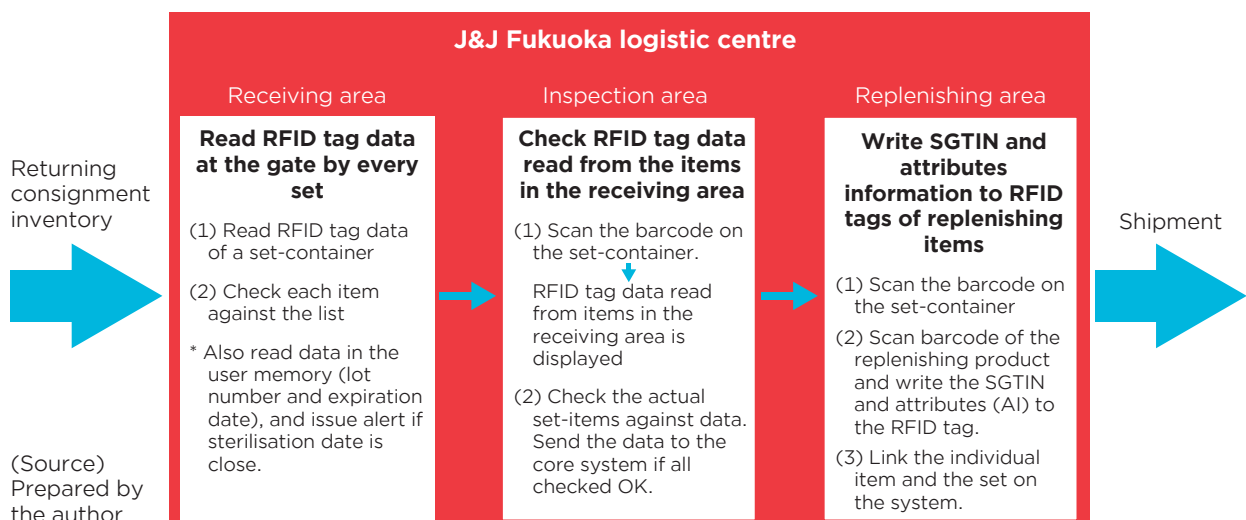
The returned set containers are replenished with the devices the medical institution had picked and again shipped as a new device set. In addition, if there are devices close to the sterilisation date, they should be changed to the new ones.

Johnson & Johnson K.K. (J&J) has commenced efforts to improve efficiencies of such operations employing RFID tags for those implant materials.

J&J has been **encoding**(*1) the product identification codes and attribute information to RFID tags, which both have been complying with the GS1 standards. SGTIN has been encoded to EPC memory bank, and lot number and expiration date have been encoded in the user memory using the Packed Objects method.

✓ (*1) This GS1-standards-compliant RFID **encoding** is currently recommended by AMDD (American Medical Devices and Diagnostic Manufacturers' Association) and many companies have plans to comply with the method.

Figure 1.2.3.2-1 Schematic flow of RFID utilisation operations at their Fukuoka Distribution Centre



When they read the RFID tag data, addition to the data of EPC memory bank, they read the data in user memory to confirm the expiration date, and notify with an alert if the date were approaching.

1.2.3.2 RFID Utilisation at Fukuoka Logistic Centre

Figure 1.2.3.2-1 explains how the implant materials are managed employing RFID at J&J Fukuoka logistic centre.

<Receiving>

The returned implant material set sent from a hospital is reached to the receiving area first and the container's RFID tag data is read. Accordingly with the acquired data, all the individual products contained in the set are listed on the monitor referring to the data stored in advance.

Individual material's RFID tags have been read next and check which material has been returned without use collating with the corresponding SGTIN list. If any of the materials, which were not included in the original set, are accidentally slipped into the container, SGTIN of the materials are displayed on the system, so that each material straying into the container from the other set can be identified.

<Inspection>

When scanning the barcode of set containers through the receiving area to the inspection area, the list of data retrieved at the receiving gate is displayed on the system monitor. Then, confirm there is any difference between the list displayed on the monitor and the products in the set. If there is no problems, the data is sent to the core system.

<Replenishment>

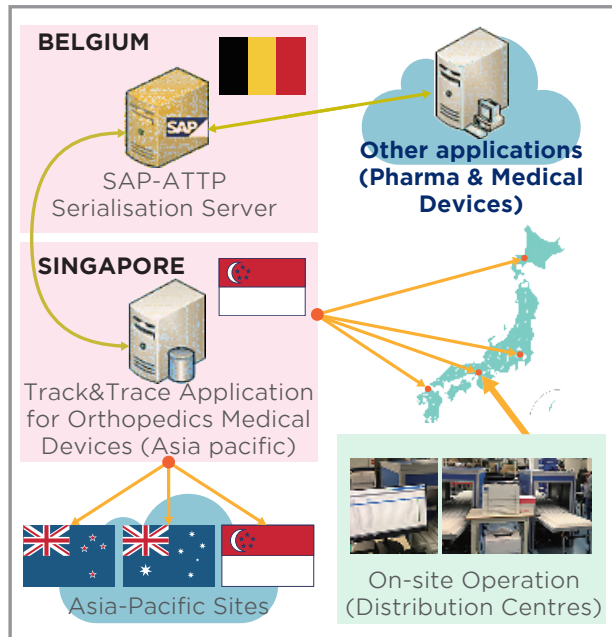
Replenishing the consumed products in the set containers at this process.

First, scan the barcode of the set container brought to the replenish area to confirm which one should be replenished. Then, scan the GS1 barcode of a replenishing product to retrieve the GTIN, lot number and expiration date (sterilisation effective date). Finally, put a free RFID tag on the desk top RFID antenna and encode SGTIN data, which is the combination of the GTIN retrieved from the barcode and the serial number, to the EPC bank, and the lot number and expiration date to the user memory.

<Serial Number Generation System>

Globally unique serial numbers can be secured as the serial number issuing requests are always transmitted through their server in Singapore. Information about serial numbers issued can all be referred from their database even the lifetime of products had been finished.

Figure 1.2.3.2-1 J&J system schematic diagram



(source) J&J

1.2.3.3 Future Prospects

Currently, about 300 sets have been received per day at Fukuoka logistic centre. Work efficiency had now been highly improved comparing with the ordinary workflow, which was to inspect each item visually and scan each barcode, as there are more than 100 individual items maximum are contained in a set.

J&J had already been implementing the RFID utilisation at their European, Australian and Singaporean logistic centres, and planning to do the same at the U.S. centre in the future.

Although currently they have been issuing the serial number and attaching the RFID tags to the items at the logistic centres, they are planning to source-tag at the manufacturing steps to accomplish maximum utilisation of RFID tags over the supply chain including of course the healthcare facilities.

1.3 Transport & Logistics

1.3.1 Asset Management of Drums Using EPC/RFID at Fukushima Canon

Fukushima Canon Inc. (Fukushima Canon) is one of the Canon sister company, which is responsible for a wide range of Canon Group business, including manufacturing printer heads, printer inks, professional-use photographic printers, and validating software for Canon products. They attached an RFID tag with GRAI (Global Returnable Asset Identifier) to the drums which contain ink for their inkjet cartridge products. By attaching RFID tag with GRAI, they manage each drum as an individual assets.

Through these efforts, they successfully had reduced the total number of drums by about 22%, and cut the working hours by about 420 hours per year.

The details are following.

1.3.1.1 RFID Utilised Drum Operation Flow

The RFID tags attached to the drums are read in the facility where drums with inks and empty drum are stored. Every day, a large number of drums are managed in and out at the facility for use within the company and other facilities.

The empty drums sent back from the facilities are also collected and kept at this facility. (Figure 1.3.1.1-1)

Fukushima Canon uses EPC/RFID for the following three drum management operations.

- (i) Receiving and shipment management
- (ii) Replenishment information management
- (iii) Location information management

(i) Receiving and Shipment Management

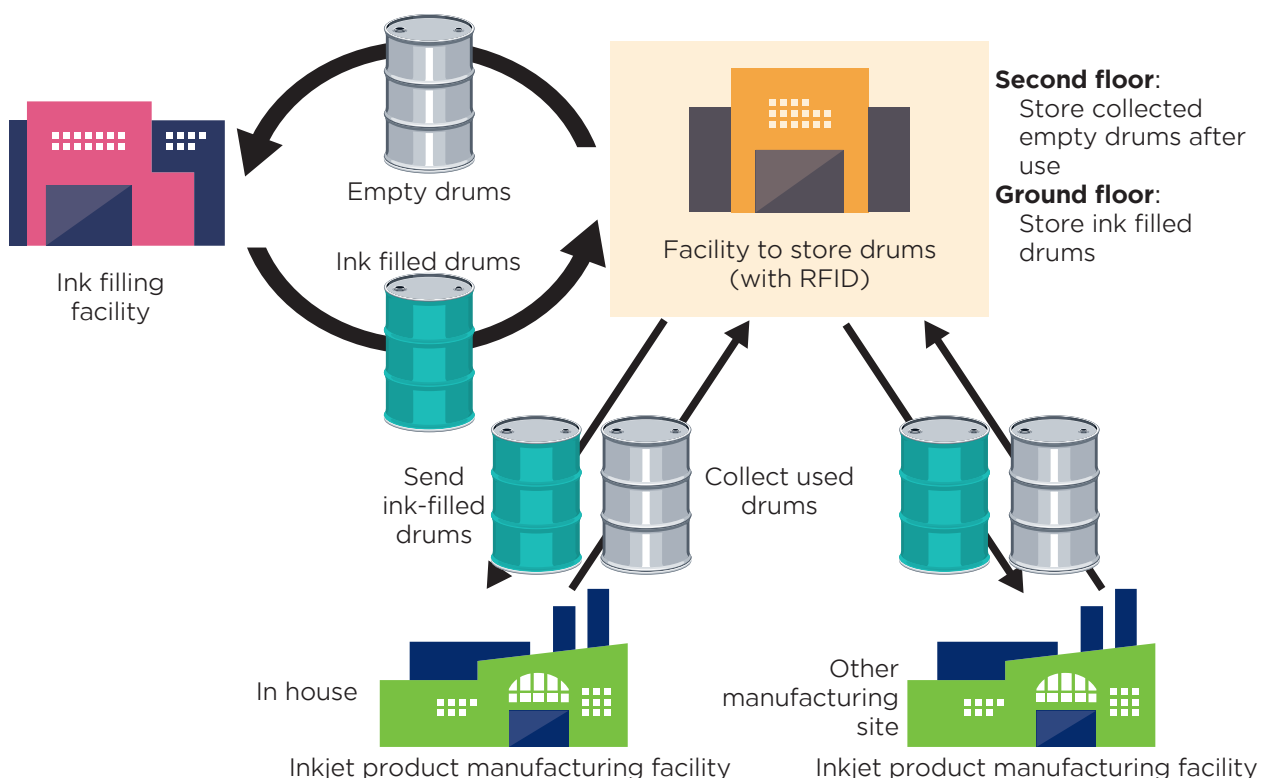
Since 2017, Fukushima Canon has been using RFID for receiving and shipment management, and this RFID system is already in full operation.

At the entrance of this facility, a gate with RFID reader, antenna, and motion sensor are installed, and the sensor triggers the antenna to obtain the RFID tag data when the sensor respond.

Because the sensor can detect whether moving direction, it can automatically recognize whether it is receiving or shipment.

In case of shipments scanned GRAI and the delivery location will be linked after worker registered the destination in the system using the tablet terminal, and then the shipping destination of each drum will be recorded on the system.

Figure 1.3.1.1-1 Drum Operations Flow



RFID reader is also installed on ceiling of the lift in the facility, and the system is getting direction signal from the lift controller to detect whether the empty drums are coming into the second floor or going out. (Figure 1.3.1.1-2)

Figure 1.3.1.1-2 Lift in the facility



The system detects that the empty drums have been coming in when the lift goes up, and going out for ink filling if it goes down.

RFID tag data is transmitted when the lift starts moving after the doors closed so that the RFID radio wave do not leak out and only the data on RFID tags in the lift can be read out reliably.

After introducing this system, it can identify individual drums and calculate the lead-time.

Also by introducing the system, the appropriate drum stock level has become clear and they could have reduced the total number of drums by about 22%.

In the past, they were inspecting the drums visually, hence the workload for the receiving and shipment management was heavy. However, as the results, annual working hours had been cut by about 420 hours after the RFID system introduced.

Figure 1.3.1.1-3 Ink-filled drums



(ii) Replenishment Information Management

They have also started to use RFID tags for the management operation of the ink-filled drums stored on the ground floor. (Figure 1.3.1.1-3)

Before the system introduction, they had to count the drums and check the expiration dates of all the drums one by one, and then attached inspected documents on them. This approach caused human errors and its workload was heavy. Therefore, the RFID system had applied to the ink filling information management, too.

After the system was introduced, both stock and expiration date can be checked in one system. Attribute data including expiry date are interlinked with the corresponding GRAI serial number on the system and not actually written in the RFID tags.

This RFID system reduced man-hour for ink filling information management by about one hour per day.

(iii) Location Information Management

Recently, RFID system has been used also for the operation to find the target drum location for shipment. They handles multiple types of ink, so that the target drums have to be accurately identified.

Before the system introduced, workers were searching for the target drum visually, which took them a long time. In addition to that, they had to secure independent spaces for each different ink colour group drum in order for an easier search of an approximate drum stock location. This also created a waste of storage space.

After the RFID system has introduced, several numbers of antennas were installed on the ceiling of all the floor and the operator can recognize the position of each drums with a tablet.

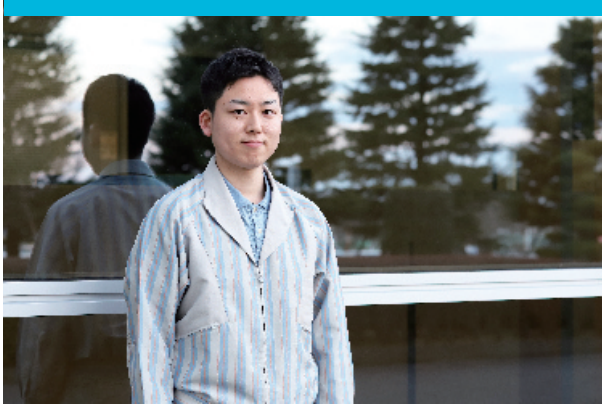
Because of this system, target shipping drum seeking time had been reduced by about one hour per day, and now they can make the full use of the storage space.

1.3.1.2 Next Steps

Fukushima Canon will have been pursuing further improvements of their operational efficiency continuously.

Mr. KATO (Figure 1.3.1.2-1) who has developed the RFID system said, 'It was difficult to find suitable RFID tags for Fukushima Canon's environment, because we need to consider tags that could endure the cleaning environment of drums and we also need to consider that drums sometimes move to outdoors.' (Tag selected works at the temperature in between -20 and 65 degrees Celsius).

Figure 1.3.1.2-1 Mr.Hiroki KATO (IT Engineer), System Technology Div. Information System Technology Dept.2 (as of the edition)



He added that, they had been facing difficulty adjusting RFID signal detection range as, at the beginning, the readers mounted on the gate and the ceilings had been too sensitive receiving signal from the RFID tags outside of the expected range.

He concluded that no matter what a laborious effort they had to make, he realised the operational efficiencies had been dramatically improved after the system integration.

1.4 B2C

1.4.1 GTINs for Product Search at EC Mall

— B2C also have Increasingly been Employing JICFS/IFDB —

1.4.1.1 Introduction

JICFS/IFDB (**JAN**(*1) Item Code File Service/Integrated Flexible Data Base), which has been operated by GS1 Japan, is the product information database service which collectively manages GTINs and their associated information. For detailed information on JICFS/IFDB, please refer to '2.3 JICFS/IFDB (JAN Item Code File Service/Integrated Flexible Data Base)' .

✔ (*1) **JAN**: EAN is called as JAN in Japan, which means GTIN-13 and GTIN-8.

JICFS/IFDB product information (hereinafter referred to as 'JICFS data') has been provided to the companies directly involved in distribution such as product manufacturers, wholesalers, retailers and others via the

Figure 1.4.1.2-1 Image of 'Search by product name' at the EC mall

Multiple search results for the same product are displayed

Similar products are mixed and listed.

| Product Name | Price (JPY) |
|--------------------------------|-------------|
| GJ Strawberry Jam 750 ml | 298 |
| GJ Apple Jam 750 ml | 315 |
| GJ Foods Strawberry Jam 1 Jar | 280 |
| GJ Foods Jam Strawberry 750 ml | 300 |
| GJ Blueberry Jam 750 ml | 298 |

'JICFS Database Provider' (hereinafter called as 'JDP'). JICFS data had been mainly used for retailer supports, including shelf allocation suggestions, and for master data creation supports for the introduction and operation of POS system and EOS, product master for POS analysis, and others thus mainly used for 'B2B' sector.

Nowadays, online shopping at EC (e-commerce) sites have been expanding accessed through smart phones or other internet terminals. Because of that, JICFS data are increasingly being employed in 'B2C' fields, which means they are more and more using JICFS/IFDB to provide product information to 'consumers' through EC sites or smartphone applications.

There are some EC site operating companies (hereinafter called as EC mall) which do not procure and sell products, whilst real shopping mall operators do them, but just provide retailers with sites for their businesses, and actual product procurement and sales have been conducted by the tenant operators. Here in this section, as one of the JICFS data utilisation use cases in 'B2C' segment, we are introducing company 'A' which is one of the JDP members, and which is utilising JICFS data at their EC mall.

1.4.1.2. Motivations Company 'A' Came to Use JICFS Data

At A's EC mall, each tenant shops had registered their product information to the mall system using their data, thus, even if the products are the same, different names

had occasionally been registered by the shops. Therefore, when an EC mall user (consumer) attempts 'Search by product name' , when the target product is handled by multiple shops, the result is not only shown by each shop and but also the similar product names are mixed and displayed (see Figure 1.4.1.2-1). It had caused inconvenient situations to the users as the proper finding of the target product was hard, consequently they had been facing difficulty selecting a shop whilst checking prices and shipping fees.

In order to improve this situation, they have built the system identifying products with GTIN, which can uniquely identify the products, for same product aggregation to list the searched products in one search result, when the products are the same, no matter which shop is handling that. To build this system, they decided to use JICFS data, product information of which is managed under GTIN and of which is maintained covering a wide range of categories.

1.4.1.3 JICFS Data Utilisation in Company 'A'

When GTIN is registered as a product information, and the information is collected under the GTIN, the same products are displayed in one group not only by the search with GTIN but also with 'Search by product name' .

When 'Search by product name' is attempted, first, several product information containing the searched product name is retrieved. The information might be for

Figure 1.4.1.3-1 JICFS Data Utilised EC Mall Product Search Results Example

'Product name' is retrieved from JICFS data and displayed as a search result

The search results are displayed in a line per a product. Click 'Shops' to find stock situations of each shop, on a new window.

| | | |
|--|--------------------------------|---------|
| | GJ Strawberry Jam 750 ml | JPY 298 |
| | GJ Foods Strawberry Jam 1 Jar | JPY 280 |
| | GJ Foods Jam Strawberry 750 ml | JPY 300 |

the same product, but with multiple shop names which have registered the information, and, in addition, it might be possible that there are variances in the registered product information. A such, different information might have been registered even for the same product, but after the information aggregation utilising GTIN, the variant search result information can be displayed in one group.

Each shop price is displayed with other information upon a click on 'Shops' button. (Figure 1.4.1.3-1)

As the product search results (product name) are collected interlinking with GTIN, product names are retrieved from JICFS and displayed, consequently the names registered by tenants are not displayed. Product name, displayed after search, is extracted from the product master company 'A' maintains (herein after called as 'A's master'), and 'A' uses 'GTIN' and 'product name' information of JICFS data as part of A's master.

EC mall tenants do not actually need to display products unlike physical shops, thus they are not physically constrained, consequently they are handling a huge number of products. As mentioned at the beginning, JICFS data contain information of products, for which GTINs have been set, across a wide range of product categories thus the data contributes to the construction of A's master.

After aggregating product information associating with GTIN, the system collects the search result (product name) by each product and display the information as a group referring to JICFS data and others. As such, users' search conveniences have dramatically been improved while selecting a shop to buy the target product with comparing prices and others among them.

1.4.1.4. Future Prospects

Currently, JICFS data are used as the information source to display product names as the search results. Even so, in the future, they are planning to implement the function which is to support tenant shops registering their product information by automatically filling boxes with product information upon only the GTIN input, if A's master have the corresponding data. JICFS data roles will be more important, when the function is implemented, as the data is one of the information sources of A's master.

The more product information JICFS data covers, the more product we will have which carry information to automatically fill in the boxes upon GTIN input.

Considering the JICFS data utilise situations in the B2C segment, in order to improve the data coverage, we will be continuously appealing for more product information registrations from the product

manufacturers onto JICFS/IFDB so that furthermore product information are registered to JICFS/IFDB, and addition to those we will be endeavouring to realise more beneficial product information database services.

1.4.2 GS1 QR Code Utilised Advanced Approach for B2B2C Services

Brand owners wish their customers to choose their products and to purchase them repeatedly, and customers want to use the purchased product safely and conveniently.

It goes without saying that the products themselves should be attractive, but in addition to that, system construction has been progressing to increase customer satisfaction and safety with additional values of the products.

Under such circumstances, in Japan, where the QR code was invented, GS1 QR code has widely been used as a reliable identification symbol being the entrance of the system to offer a variety of information on products taking advantage of its functionality and reliability.

One of such servicing systems is 'scodt®' which is offered free from TDN International Ltd. (TDN) in multi-languages, and here in this section the use cases are explained.

This scodt® service offers a lot of information instantly when a customer scans the GS1 QR code, attached by the brand owner of the products, with a smartphone or other devices. In addition, users can receive recall information and others, which require instant notifications, as a push notification.

Actually the service is providing the following information.

- Detailed product information
- Proper usages
- Operation manual
- Access to web sites, etc.
- Maintenance period
- Appropriate duration of use
- Recall information

In Japan, a part of the Food Sanitation Act had been amended to impose reporting of food recall cases on Wednesday, 13th June 2018 to strengthen food safety efforts.

Therefore, we believe that services utilising GS1 standards for reliable product identification will increasingly function well in the future.

1.4.2.1 Service Overview

TDN issues GS1 QR code with the GTIN (AI (01)) and the URL (AI (8200)) encoded after registering the product information provided by brand owners to their dedicated system.

Brand owners, after receiving the GS1 QR code, attach it onto their target product.

Consumers, after scanning GS1 QR code on the product using scodt® application, can refer to the product information in detail and operation manual, and get access to the website.

In addition, customers are kept informed with the maintenance period and appropriate end-of-life date as push notifications, hence they can use the product safely.

Figure 1.4.2.1-1 Free application dedicated to GS1 QR Code (scodt®)



1.4.2.2 Utilisation Examples

<Efforts Improving Hardware Product Safety (Sanjo City and Tsubame City, Niigata Prefecture)>

The adjacent cities Sanjo and Tsubame are located about 200 km north of Tokyo with the population of about 170,000 in total and have a long history manufacturing Japanese nails started in Edo era (1603-1868) and still now the hardware manufacturing businesses are popular in the area.

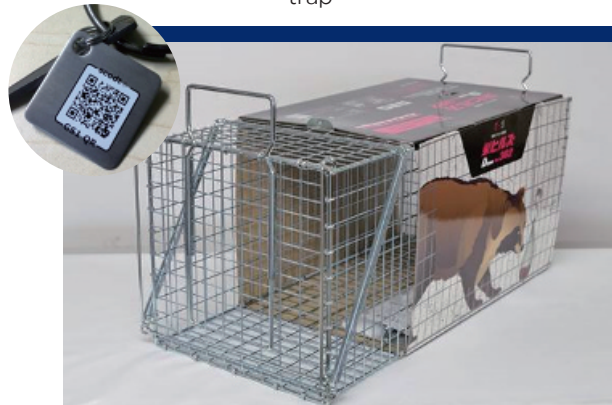
Most of them are small-and-medium-sized-business and are thrustfully using the internet as a means to provide information.

One of the local companies that manufactures and sells traps for vermin control has employed the scodt® service.

Recently, damages to crops, houses, and humans by wild animals have grown up to be a problem worldwide, and the need for damage prevention has increased. One of the preventive measures is to install traps, but if they were not properly assembled at the site, they would not work as they are intended or even the installing person might get injured.

Therefore, the company attached the GS1 QR code to the trap in order to refer to the product information and assembling procedures with just scanning the code with the mobile terminal, easily and reliably.

Figure 1.4.2.2-1 GS1 QR code attached vermin control trap



Owing to that, the trap installers now can set up the traps accurately and safely while checking the information displayed on the mobile device screen in the field.

In addition to the trap company, a local household goods manufacturing company that manufactures frying pans has also been using this service to improve customer satisfaction.

There are many variations of frying pans in terms of materials, processing methods, and sizes.

In order to help customers understand characteristics of each frying pan, use them effectively, cook foods deliciously, and care for them properly, the company is making efforts to provide information on its products, adding the GS1 QR code to guide customers to the information.

They are going to refine information to further improve customer safety, including multilingualisation, anticipating the expansion of the Japanese cooking utensil businesses toward the foreign markets.

<Utilisation for Koji Cosmetics>

‘Koji’ may not be a familiar word to foreign people, which is made by breeding microorganisms such as fungus, which is effective in food fermentation, on grains such as rice, barley, and soybeans. It is used in

Figure 1.4.2.2-2 GS1 QR for Cosmetics



the production of fermented foods such as Sake, Miso (soybean paste), vinegar, Soy Sauce, and others.

Since the Koji is regarded as effective to beauty, one Japanese company is manufacturing and selling cosmetics using Koji. Because their ingredients are different from those of common cosmetics, their usage and features need to be provided to customers adequately.

This company, making good use of GS1 QR code leveraged service, is running effective and economic publicity steering customers to their web page. The page appeals the products' effect, safeness, excellence in feeling of use and proper usage.

As cosmetics are kind of popular products for inbound tourists, they made their web pages multilingualised (Japanese, German, Italian and French), and then propelling the business expansion to the overseas markets.

<Utilisation for Agricultural Machinery>

There is a wide range of items as the agricultural machinery including relatively large machines such as tractors and cultivators to a variety of tools and jigs.

In the past, those products had been offered mainly for agricultural professionals, but recently, smaller sized equipment has been made available on the general market through hardware stores and others, targeting individual farmers and gardeners.

Some companies are trying to use this service to transmit product information to help customers, who are relatively unfamiliar with such machinery, operating and maintaining them safely and securely.

Customers, as long as they have internet access, just need to scan the GS1 QR code on the label attached to the product with mobile terminal, thus they can refer the information, including operation manual and others instantly for safe use.

1.4.2.3 Conclusion

Accurate information should be available to the person in need at the required place and in a required time in order for the product to be used safely and securely accordingly with the brand owner's intended operation and environment.

In addition, it is also important how to communicate with customers in order to get their understandings on the appropriate product operation to get their proper product reviews.

Furthermore, if, by any chance, recall case is generated, quick and accurate information transmission is required to the target customers.

It is expected that such services utilising GS1 QR code will have been bringing higher additional values to the products which may lead us to enjoy increasing customer satisfactions.

Column: EPC/RFID (Electronic Tag) Current Picture in Japan

- RFID Tag Application has been Increasing -

Introduction

It was 2003, EPCglobal Inc., a standardisation organisation for RFID tags, had been established. Many Japanese companies had also participated into the EPCglobal and cooperated in the development of standards. Going through about 17 years of the history after that, more and more companies are finally coming to use RFID tags in their business operations. Recently, its application fields have been broadened to the fields other than apparel industry, fostering a sense of anticipation of RFID tag utilisation.

History and Current Situation

In Japan as well, researches had been conducted on RFID tag utilisation starting from around 2004, and various demonstration experiments had also been carried out. Regardless of the efforts, it, even had attracted attention, did not become immediately popular. One of the main reasons for this was the case that people had shunned the high cost of RFID tags and readers, but presumably also the performance of the tags and readers, such as the reading accuracy, was still immature.

In Japan, as in other countries, apparel industry had led the introduction of RFID tag. The Japan Apparel-Fashion Industry Council (JAFIC) had been studying on this and, in 2010, an apparel brand started to manage all of their products utilising RFID tags. This was followed by some famous domestic brands such as BEAMS and UNITED ARROWS. Since then, major

apparel companies, including UNIQLO Co., Ltd., have introduced it.

In the meantime, in the logistics field, RFID tags have been used for the management of rental pallets and carts used for deliveries of orders from distribution centres to retail stores. Although RTI (Returnable Transport Item) is indispensable in the logistics industry, its location is often unknown before the introduction of RFID tags, which has led to increased costs.

Recently, RFID tag is introduced to managing mesh boxes for agricultural products and metal logistic containers for motorcar parts.

In addition, the tag application is spread to various fields including management of library collections, healthcare items (medical devices and supplies) and construction materials.

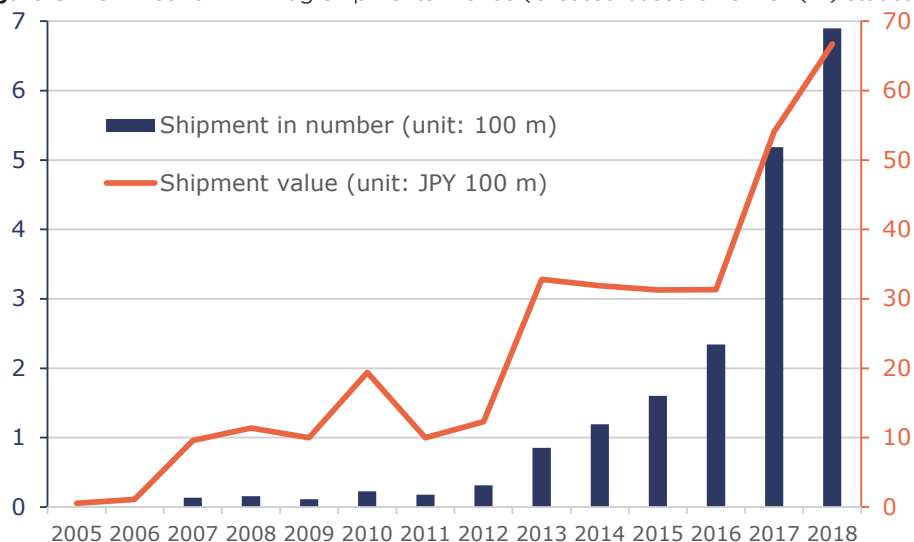
UHF-band RFID Tag Market Size

Figure C-1 shows trends in the number and value of shipments of UHF-band RFID tags in Japan.

 (*1) **JAISA**: Japan Automatic Identification System Association

RFID tag shipments have grown steadily since 2013. It also suggests to us that RFID tag unit prices had been decreased in the period between 2013 and 2016, as the values were flat while the shipment had been increased. We could estimate that the recent RFID tag unit price is about JPY 10 (about USD 0.1) assuming that the greatest portion of the application is for apparel

Figure C-1 UHF-band RFID Tag Shipments Trends (Created based on **JAISA**(*1) statistics)



industry, although it is hard to unambiguously define so, because there are a variety of RFID tags.

▪ UHF-band RFID Tag Utilisation State

GS1 Japan and JAISA together have conducted a survey on the use of RFID tags in Japan. According to the survey, the apparel industry dominates the use of RFID tags by industry, followed by libraries, logistics, and warehouses. In addition, it is used more in open and mobile environment than in a closed environment (within facilities or areas such as factories and warehouses).

Currently, most of the users are vertically-integrated apparel companies. Apparel companies of this type had been using their own codes (barcode) even before the introduction of RFID tags, and most of them have been storing their own codes in the RFID tags as the identification codes instead of the GS1 standardised codes.

And main purpose of the introducing RFID tags are incoming/shipping and inventory management. These applications of utilising the high speed reading capability of multiple RFID tags are the greatest advantage of introducing RFID tags.

▪ 'Land Mobile Radio Station' Category Newly Added

Before 27 March 2019, Japanese radio regulations permitted UHF-band RFID readers as 'premises radio stations' (1W or less antenna power) or 'specified low power radio stations' (250mW or less antenna power). Now 'land mobile radio stations' are also permitted in addition to them.

While the premises radio stations are allowed to operate only in their designated premises, the land mobile radio stations can move on land, e.g. the readers attached on truck running on public roads can be supported. (Table C-1) However, maritime and aeronautical uses of the land mobile radio stations are prohibited.

The readers as the land mobile radio stations are classified into two categories: 'licensed radio stations' and 'registered radio stations'. The licensed land mobile radio stations are not required to perform LBT (Listen Before Talk). The licensed land mobile radio stations need to be operated by licensees of On-the-Ground III-Category Special Radio Operators or exceeding.

Existing readers used as the premises radio stations can be changed over to the land mobile radio stations with some formalities.

Table C-1 Type of UHF-band RFID tag Radio Stations (Created referring to material of JAISA)

| Radio station | Land mobile radio station | | Premises radio station | | Specified low power radio station |
|--------------------------------------|---|---|--|---|-----------------------------------|
| License system | Licensed radio station | Registered radio station | Licensed radio station | Registered radio station | N/A |
| Required qualification for operators | On-the-Ground III-Category Special Radio Operators or exceeding | Notrequired | | | |
| LBT | Not required | Required | Not required | Required | Required |
| Antenna power | 1 W or less | | | | 250mW or less |
| Conformity certification | Technical regulations conformity certification or Construction design certification | | | | |
| Application before use | Starting use after approval of a license application. | Starting use after registration based on an application. Submitting an establishment notice within 15 days from starting date of use. | Starting use after approval of a license application. | Starting use after registration based on an application. Submitting an establishment notice within 15 days from starting date of use. | Not required |
| Application at relocation | Not required | | As soon as possible after relocation | | Not required |
| Location of use | Land: available on public roads Maritime: prohibited Aeronautical: prohibited | | Land: designated premises only Maritime: prohibited Aeronautical: prohibited | | No restriction |
| Valid until | 31 May between 4 and 5 years later from registration date | | 5 years later from registration date (if not specified) | | N/A |

▪ Headway of RFID Tag and Reader

The technology developments of RFID tags, readers, and other devices have advanced, as the introduction of them have progressed.

In the apparel industry, the number of items handled is very large, as such, there is also a strong demand to read the contents in cardboard boxes without unpacking during inspections. Therefore, inexpensive but sensitive RFID tags have been developed and provided. However, the memory capacity has been reduced to realise the high sensitivity and low cost.

Regarding the reader, the peripheral products of antenna are rather being progressed in improvement and ingenuity. The increased RFID tag sensitivity, on the other hand, brought up an issue that is to read the tags which do not have to. Recently, to avoid the excess reading, they have been endeavouring to limit the reading range employing a tunnel equipped with antennas or to read only the tags within close range above it in the form of a sheet antenna. In addition, they are making efforts to prevent unnecessary radio waves from passing through the walls by attaching materials that reflect or absorb radio waves.

At present, handheld readers, that are easy to handle, might mostly be used, but in order to promote automation, they have been studying about constant monitoring systems with fixed readers.

■ Toward Future Expansion of Use

▪ Adoption of Standard Identification Codes

Industries are starting to use RFID tags in a variety of fields, not just the apparel industry. Even though, the concern in this situation is still the identification code. Standardisation of identification codes is a major assumption for the use of RFID tags throughout the supply chain. Of course, this is not just limited to RFID tags. Now, could the in-house code be satisfactory, if the codes are used only in the company's closed circumstance? There may be multiple applications for the code usage within one company. For example, some departments may want to use RFID tags for product management, while others may want to use those for asset management. In this case, if an asset management RFID tag is read by a reader of product management system, how should the system handle it? Identification code in the RFID tag, anyhow, is the criterion for each system to rely on to determine what kind of process to take. Assuming this is the case, we should still adopt a standardised identification code for the RFID tags.

Incidentally, some industries are moving toward

utilising GS1 standard identification code (SGTIN), which include tire and healthcare industry. It might be a good reason for companies to employ standard identification code, if industry associations and others provide guidelines on what kind of standard identification code to adopt.

▪ RFID Tags and Information Systems

Many of the current expectations for RFID tags might be the operation efficiency improvements, which need to count items, such as stocktaking and inventory management through high-speed batch reading. Such streamlining of work is one of the most important solutions in the labour shortage situation.

In the stocktaking operation with barcodes, workers find the product and then scan the barcode. On the other hand, when the stocktaking is conducted with the RFID tag, since the objects are distant separated from readers and there are multiple of them, it is difficult for operators to know whether the object had actually been read. Thus, it is common for them to prepare an identification code list of all the objects that should exist, and delete the read code from the list.

This example suggests that even a relatively simple task of inventory would require an information system when RFID tags are integrated into the operation. Or to be more precise, a system to handle the unique identification codes of the tags, which is, for example, SGTIN allocated to each RFID tag, will be needed.

In the conventional business system, they might have mostly been monitoring and controlling the total count. For example, they save count of certain stock product into a database. In contrast, an RFID tag system would necessarily have to deal with each unique identification code attached to each product, one by one.

▪ Toward Overall Optimisation

Although the introduction of RFID tags is expanding, there are still many cases where they are used only within their company. RFID tags have the potential not only to improve the efficiency of operations within a company, but also to optimise the operation of the supply chain or the entire industry. In order to further expand these possibilities, it is essential to standardise the necessary items among the parties concerned and still to establish an information system.

The main assumption for all of these is to create an environment that enables easy reading of RFID tag, in other words, utilises multiple batch reading abilities. Then, using the standardisation as a steppingstone, we can move forward with the development of informatised system that allows us to leverage the application of unique identification codes, which will lead us all to the overall optimisation.

2. Services & Solutions

2.1 GS1 AIDC Standards Conformity Check Guide and GS1 AIDC Standards Self-Declaration of Conformity Service Launched

In January 2020, GS1 Japan released the GS1 AIDC Standards Conformity Check Guide (hereinafter called as Check Guide), which provides basic information on the GS1 standards and checklists by functions to check if subjects are conformed with the GS1 standards.

The contents of the Check Guide had been discussed in the joint committee meeting, which consisted of members from barcode related equipment manufacturers and distributors, and GS1 Japan.

The main readers expected are barcode software companies such as barcode printer and scanner manufacturers. These companies can utilise the Check Guide in order to understand GS1 standards correctly and check how well their barcode related products are conforming to the GS1 standards, and also utilise as the tool for implementing corresponding functions to fulfil GS1 standards requirements.

2.1.1 Outline of GS1 AIDC Standards Conformity Check Guide

This Check Guide is composed of two main parts.

First half of the Check Guide summarises important information and points of attention related to GS1 standards. Specifically, this part contains explanations for GS1 identification keys, GS1 application identifiers, overviews of each GS1 standard barcode, HRI, FNC1, barcode size, truncation, and more.

The second half provides checklists to confirm if the target devices and software intended to generate and/or capture GS1 standard barcodes are equipped with the required functions. The target product types of the checklists are GS1 barcode generation software, GS1 barcode printers, and GS1 barcode scanners. The checklists are provided by product categories and barcode symbol types.

Both mandatory and optional check item groups are listed as the checklists.

Mandatory items are minimum but indispensable functions to abide by GS1 standards. These include, for example, capabilities of generating and/or capturing symbols accordingly with ISO and other appropriate standards, calculating check digit automatically (or alert if the result was incorrect).

Optional items are, in fact, not required for the purpose of GS1 standards conformity. However, these are user-friendly and desirable, nice-to-have functions for the users to be able to generate and capture correct GS1 standard barcodes. In other words, the products, that meet the optional items, have more useful functions such as not generating barcodes that do not meet GS1 standard or issuing warning if barcodes do not meet GS1 Standard.

Figure 2.1.1-1 GS1 AIDC Standards Conformity Check Guide



GS1 Japan has made this Check Guide available for download from the website for dissemination purpose anticipating its maximum utilisation.

<www.dsri.jp/standard/gs1/index.html#gs1guide>

2.1.2 Launch of GS1 AIDC Standards Self-Declaration of Conformity Service and Publication of List of GS1 AIDC Standards Self-Declared Conforming Products

In addition, in April 2020, we started GS1 AIDC Standards Self-Declaration of Conformity Service. This service is provided as a part of GS1 Japan Partners (hereinafter called as GJP) membership privileges, which is one of the membership programs offered by GS1 Japan.

GS1 AIDC Standards Self-Declaration of Conformity (hereinafter called as Self-Declaration of Conformity) is the declaration proved and stated by the manufacturers themselves, with the checked results, after confirming the functions of their product required to conform with GS1 standards based on the checklist provided in the Check Guide. For system vendors, it provides an opportunity to promote their GS1 standard

complied barcode products. And for users looking for barcode related products, it is a reference to help them find GS1 standard compliant products.

GS1 AIDC Standards Self-Declared Conforming Products (hereinafter called as Product List) are listed on the following page with the products information, which the conformity was declared by the companies. <www.dsri.jp/partnership/member_products/>

2.1.3 Product List Outline

Product information is listed by product categories (Generation software, Printer, and Scanner). Specifically, the information of manufacturer name, model name, product page URL, compatible GS1 barcodes, and the degree of conformance to the GS1 standard for each product can be checked (Figure 2.1.3-1).

In addition, GS1 standards conforming details, which are filled by applying companies, can be browsed item by item with Self-Declaration of Conformity and checklist after clicking Detail button. Furthermore, contact information of each company is on the Self-Declaration of Conformity for direct contact with the company.

Figure 2.1.3-1 List of Self-Declared Conforming Products on the Web Page

The screenshot shows the GS1 Japan website interface. At the top, there is a logo for GS1 Japan and a search bar. Below the logo, there is a navigation menu with categories like 'About', 'Get Codes & Overview', 'Standardisation', 'Database', 'Councils & Study Groups', and 'Education & Resources'. The main content area is titled 'Councils & Study Groups' and features a list of links for 'GS1 Japan Partners' and 'Supply Chain Standards Management and Promotion Council'. The central focus is on '3. GS1 Standard Barcode Scanners', which includes a note: '* Click on Detail for detailed information on functions of each product'. Two product entries are shown, each with a table of details and a 'Details (Browse the Self-Declaration of Conformity)' button.

| ABC Co., Ltd. | |
|---|---|
| Manufacturer name | ABC Co., Ltd. |
| Model name | ABC Multi Scanner |
| Product URL | https://www.ABC.co.jp/products/ABC-Multi-Scanner.html |
| Compatible symbols | EAN/UPC, ITF, GS1-128, GS1 DataBar |
| Standard conformity+ | GS1 DataBar Composite, GS1 DataMatrix, GS1 QR |
| Details (Browse the Self-Declaration of Conformity) | |

| ABC Co., Ltd. | |
|---|---|
| Manufacturer name | ABC Co., Ltd. |
| Model name | ABC Tough Scannerr |
| Product URL | https://www.ABC.co.jp/products/ABC-Tough-Scanner.html |
| Compatible symbols | EAN/UPC, ITF, GS1-128, GS1 DataBar |
| Standard conformity+ | GS1 DataBar Composite, GS1 DataMatrix, GS1 QR |
| Details (Browse the Self-Declaration of Conformity) | |

As explained above, mandatory items are indispensable minimum required elements for the generation and capture. Therefore, only the products fulfilling all the mandatory items can be declared and published as the GS1 standard complied products on the GS1 Japan website.

On the other hand, as optional items are user-friendly, nice-to-have functions, degree of standard conformity is grouped into two, which are Standard conformity+ and Standard conformity, accordingly with the count of checked optional items. By defining the standard conformity degrees of barcode related products into two, users can now easily find the degrees of GS1 standard conformity.

2.1.4 Supporting Activities Promoting GS1 Standards Correct Usages

The Check Guide and the Self-Declaration of Conformity Service are both intended for promoting proper use of GS1 standards.

Therefore, the Check Guide has been prepared expecting utilisation by even such readers, who are non GJP members and/or not carrying out Self-Declaration of Conformity, in mind. The Check Guide covers basic information and the contents are created to be as clear as possible, even for non-technical readers so that it can be utilised as barcode related GS1 standard reference. It is also expected that customers who are not applying for Self-Declaration of Conformity Service can also utilise the checklist to review their products.

Furthermore, as a similar effort, GS1 Japan has released a smartphone application, GS1 Japan Scan, which allows users to check whether their barcode is in line with the GS1 standards

<www.dsri.jp/application/gs1japanscan/>.

GS1 Japan will continue focusing on customer supports for proper GS1 standards implementation and for smooth adoption through providing various resources, tools, and services. In addition, we are also going to plan seminars on the GS1 standards and briefing sessions about the Self-Declaration of Conformity Service.

2.2 GS1 Japan Data Bank (GJDB)

GS1 announced a policy that it should urgently create and offer a centrally managed and referable system for information, which is interlinked to GS1 identification keys such as GTIN and GLN, while managing and operating GS1 Company Prefix allocation much more strictly.

On the basis of this policy, GS1 is launching a new database service GS1 Registry Platform which stores basic information on GS1 Company Prefix and GS1 Identification Keys including GTIN and GLN and provide essential information necessary to identify products or locations.

To register or access to GS1 Registry Platform, users need to be routed through local GS1 MO service in principle, and GS1 Japan Data Bank (GJDB) service is the entrance for Japanese users.

GJDB has been up and running since October 2019, which is the system to offer easy registration and management of GTIN and its associated information, and to release the registered product data seamlessly to GS1 Registry Platform and domestic database systems.

With the GJDB initial release, brand owners can easily go through GTIN allocation, GTIN management, and barcode symbol image generation/download, and further functional enhancements are planned for the following releases.

2.2.1 Challenges Related to Product Information in Japan

In Japan, there are a lot of brand owners of small and medium-sized enterprises (SMEs), and they have been largely bothered by registration and management of product information.

On the other hand, wholesalers and retailers, which handle those products from the SMEs, are undergoing inefficient works on product data exchange.

2.2.1.1 Challenges Related to Product Information Registration and Management

It is a big decision for SMEs to afford a product management system from the perspective of cost-effectiveness.

Therefore, those who cannot acquire such system are mostly processing their product information with handwriting or entering data to a spreadsheet.

However, when GTIN is manually allocated without enough knowledge of GTIN structure (composed of three elements: GS1 Company Prefix, item reference, and check digit), the risk of wrong product information registration, which includes registering incorrect GTIN, allocating the same GTIN to different products (duplicate), and others, would be increased.

Wrong GTIN allocation brings trouble down to brand owner's trading partners including wholesalers and retailers, as GTIN is the key for information throughout the value chain.

2.2.1.2 Challenges Related to Product Information Exchange

At retailers and wholesalers sides, they need correct product information in a timely manner, but they have been struggling with collecting such product information.

In Japan, there is no such database that centrally manages all the product information retailers need for their reference.

As a result, wholesalers and retailers need to ask brand owners for the necessary product information each time as needed.

The product information is transmitted from the brand owners in various ways which include entering the data into the retailer's Web system, sending retailer-prepared spreadsheet as an email attachment after filling it out with the required data.

These kinds of manual operations give brand owners undesirable burdens and cumbersome operations, which might be resulted in the wrong information entry even for the same product, or entry with different information, and any of them has a chance to alter the information.

Product information is vital for ordering, logistics, and sales operations, thus wrong information affects the entire business.

2.2.2 Functions GJDB Offers

GJDB initial release is prepared mainly to reduce as much of issues on product information registration and management or product information exchange including GTIN allocation as possible, and the following functions are offered:

- (i) Easy allocation of GTIN
- (ii) Easy management of GTIN
- (iii) Easy generation of barcode symbol images for GTIN
- (iv) Seamless interlinked operation with GS1 Registry Platform and domestic databases

2.2.2.1 Easy Allocation for GTIN

GTIN needs to be correctly allocated with setting item reference according to the rule and then calculating the check digit.

This process might be a kind of burdensome, especially for SMEs, but this GTIN allocation has been made easy with GJDB which requires only the following three steps:

<Three Steps of GTIN Allocation>

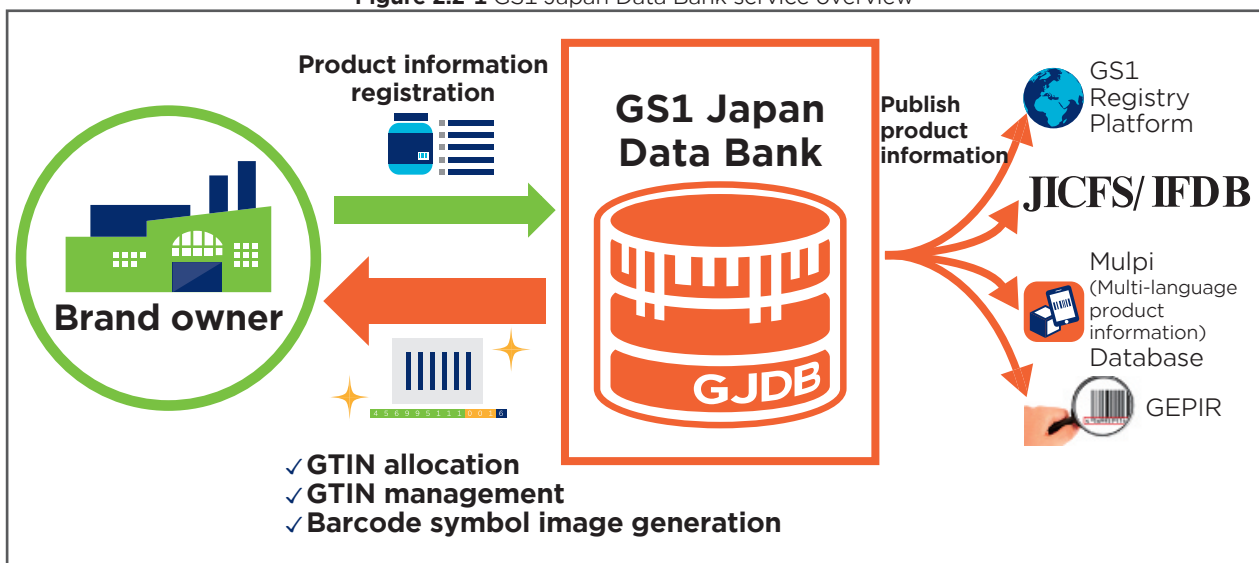
- (i) Select GS1 Company Prefix
- (ii) Enter the basic product information
- (iii) Press the 'Issue GTIN' button

2.2.2.2 Easy Management of GTIN

The biggest reason to use GTIN is its global uniqueness.

Reduplication of GTIN brings about confusions to stakeholders who handle the products, including wholesalers and retailers, and undermines supply chain efficiency.

Figure 2.2-1 GS1 Japan Data Bank service overview



In order to avoid the confusions, each brand owner has to allocate GTIN correctly without reduplication.

Brand owners do not need to worry about the GTIN reduplication once they have registered all of their own products to GJDB, as the GTINs are correctly managed.

Furthermore, the status of GTIN allocation including counts of the allocated GTINs (also remaining unallocated GTIN count) per a GS1 Company Prefix is visualised with a coloured bar chart.

2.2.2.3 Easy Generation of Barcode Symbol Images for GTIN

Brand owners need to allocate GTIN for their product

and then display the barcode.

If the brand owner leaves those work to a printing company, the owner just needs to give the GTIN data. On the contrary, if the owner would like to carry out the process by themselves, they need to find a software for the symbol image generation, and then display it on the product.

There is no problem printing the barcode if they are familiar with the process, but the SMEs are not always familiar with that, and the symbol image generation for the allocated GTIN is not so easy.

Utilising GJDB function, brand owners can easily generate the necessary EAN/U.P.C. symbol images and

Figure 2.2.2.1-1 GTIN allocation made easy (three steps)

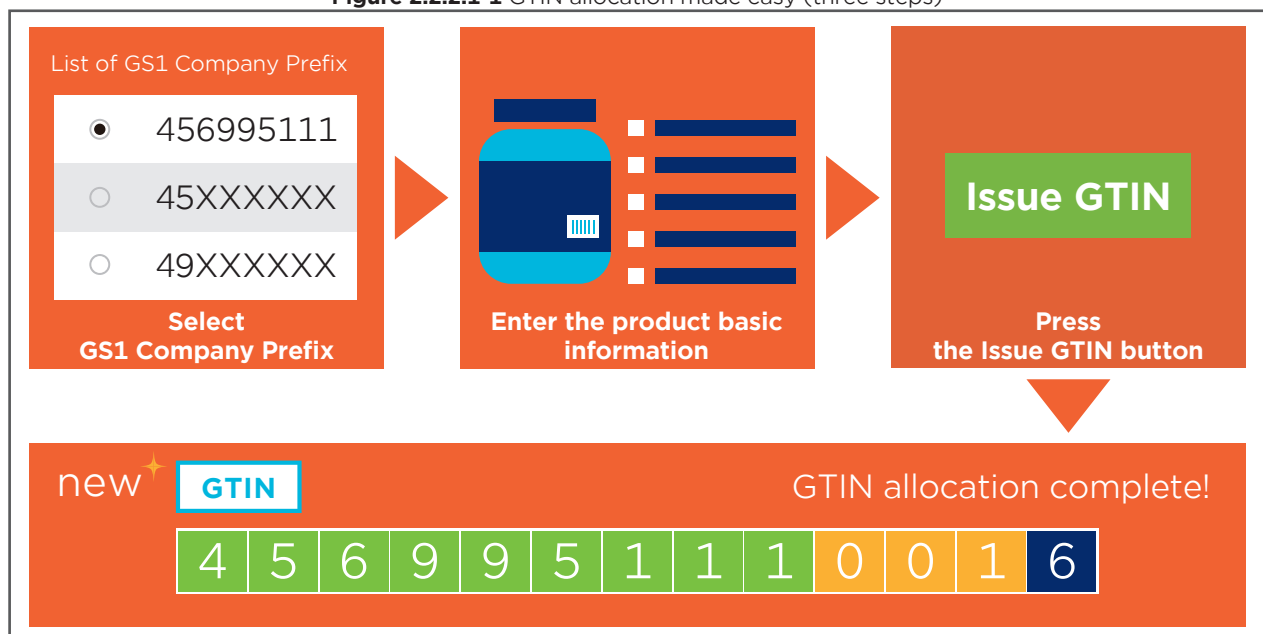
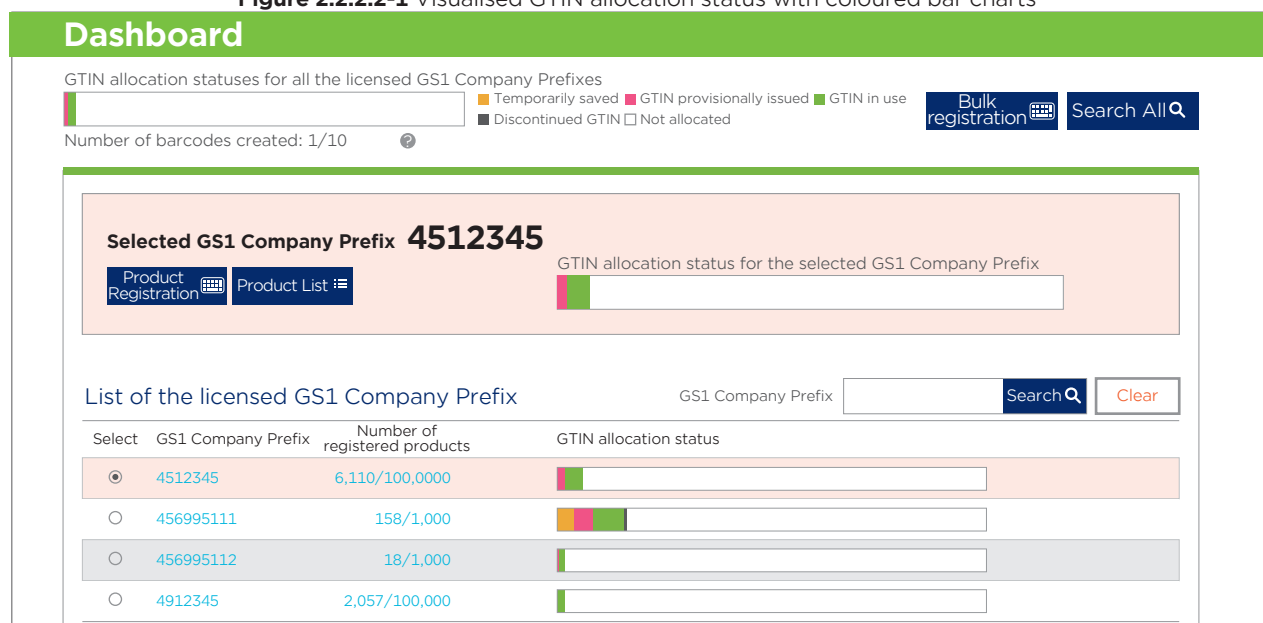


Figure 2.2.2.2-1 Visualised GTIN allocation status with coloured bar charts



download them in the electric format, after they published the product information to GJDB and its connected database.

2.2.2.4 Seamlessly Interlinked Operation with GS1 Registry Platform and Domestic Databases

Brand owners anticipate their products to be widely sold. For that purpose, they need to share the accurate product data among the stakeholders and make them to be well known to the parties concerned.

However currently, to share the product information, brand owners need to provide it in many different ways, following each party's own format request, which gives them a burden.

GJDB allows users to publish their accurate product information globally as it has already been seamlessly interconnected with GS1 Registry Platform, JICFS/IFDB (2.3), GEPIR, and Mulpi database (2.7).

2.2.3 Number of Items Registered in GJDB

About 80,000 items have been registered in GJDB by approximately 5,000 brand owners as of August 2020.

During the service start-up period, we had been asking for the companies, who got their GS1 Company Prefix newly allocated, to register their product information, but it is now expanding to the customers who already had been holding their GS1 Company Prefix before the start-up. Therefore, the number of items and brand owners will be expected to increase further in the future.

2.2.4 GJDB Update History Information

Since its release in October 2019, we have been making several updates to GJDB to make it easier to register product information and to improve usability. GJDB will be continuously updated to incorporate requirements from our local users and directions of GS1 data services.

Figure 2.2.3-1 Item counts by categories

| Categories | Item counts |
|--|-------------|
| Foods | 14,062 |
| Healthcare supplies | 2,438 |
| General merchandise, Household items, Durable consumer goods | 20,302 |
| Cultural goods | 9,457 |
| Apparel, Personal items | 27,720 |
| Others | 4,772 |
| Grand total | 78,751 |

Table 2.2.4-1 below shows the update histories that have been made and planned.

Table 2.2.4-1 GJDB update histories

| Dates | Contents |
|--------------------|---|
| July 2020 (Q1) | <ul style="list-style-type: none"> Functions enhanced for those who register product information Bulk upload/download, bulk update, and assistance for classification selection New function released for those who browse product information Product information search, browse functions |
| December 2020 (Q3) | <ul style="list-style-type: none"> Function to be enhanced for those who register product information Adding barcode symbol form pattern |

2.2.5 Future of GJDB

GJDB is going to widen its product information coverage, getting cooperation from the product information database of related industries, and then step-by-step strengthen its features to be able to solve various issues arisen from domestic product information exchange.

Furthermore, GJDB is going to be evolved not only for the service of product information registration by brand owners, but also for the service of efficiency improvement in product information exchange for wholesalers and retailers who receive the data.

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

Since 1988, GS1 Japan has been operating JICFS/IFDB, database of product catalogues and collecting basic product attributes, e.g., GTIN, product names, product categories, weights, and quantities.

Product data are not only registered directly by product manufacturers, but also collected from product information databases of various industries, including alcoholic beverages and processed foods, household goods and cosmetics, consumer electronics, and OTC (Over-the-Counter) drugs, and even of

distributors. These data are then entered into the database after manual maintenance according to the JICFS/IFDB standard and made available to retailers, wholesalers, and other users via JICFS Database Providers (JDPs) (Figure 2.3-1).

Table 2.3-1 shows the number of the products registered in JICFS/IFDB.

Approximately 20,000 new products are registered to the database every month.

Most of the data registered in the JICFS/IFDB were related to food or commodity, but in recent years the data count of products such as stationery, toys, durable consumer goods has been increasing, because the market demands for GS1 barcodes mark on them are raising.

Similarly, more variations are seen in the usage cases of product data in JICFS/IFDB.

In the past, these data were mostly used in the field of business to business (B2B), i.e. to support retailers in creating the master data to introduce a point-of-sale (POS) system or an electronic ordering system (EOS), to suggest shelf allocation, and to analyse POS data.

Recently, however, usage for the field of business to consumers (B2C) is growing according to the increase of online shopping sites and consumer apps for Consumer Panel Survey.

Since many stores on online shopping malls register the products information using their own codes and product names, the products are sometimes repeatedly registered under different names and categories.

To solve this problem, several companies operating online shopping malls use GTIN for product information control. Refer to '1.4.1' for specific examples.

Data collection applications for Consumer Panel Survey use the product information of JICFS/IFDB as the data

Figure 2.3-1 JICFS/IFDB system flow

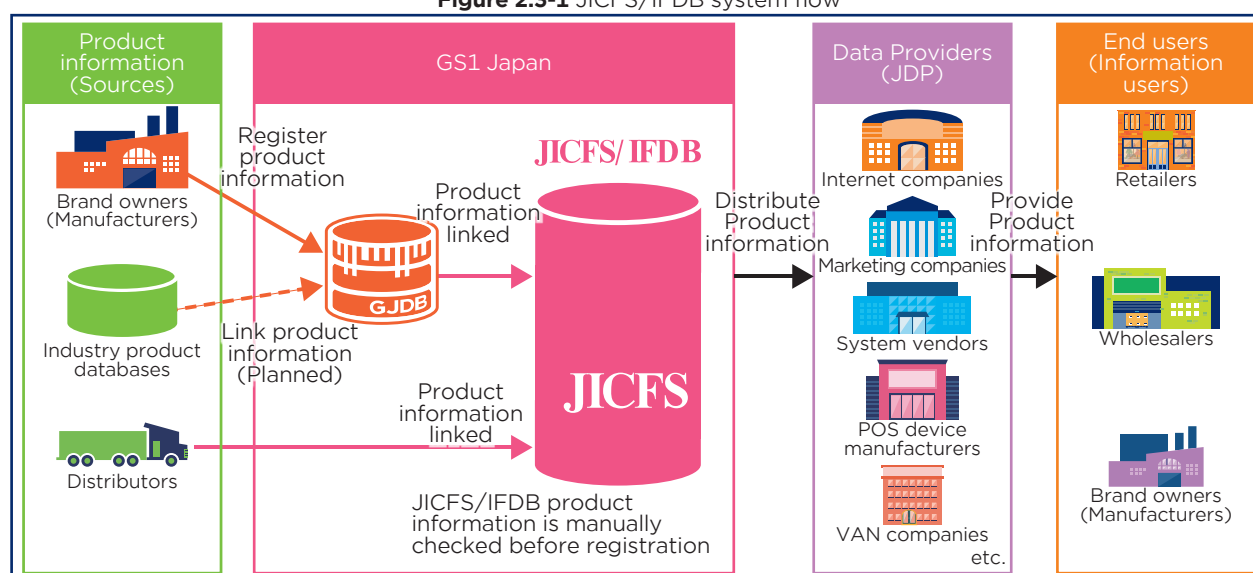


Table 2.3-1 Number of Registered Products

| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|--|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Food | 1,291,008 | 1,371,489 | 1,465,218 | 1,544,912 | 1,628,262 | 1,688,487 | 1,766,776 |
| Commodity | 714,237 | 759,793 | 807,882 | 855,876 | 897,873 | 937,338 | 976,486 |
| Recreation and Miscellaneous | 453,135 | 492,503 | 532,678 | 575,471 | 616,509 | 653,634 | 695,942 |
| Durable Goods | 262,309 | 281,236 | 311,321 | 337,560 | 406,105 | 459,415 | 485,633 |
| Apparel, Personal items & Sporting goods | 245,395 | 270,240 | 301,951 | 331,360 | 367,305 | 397,709 | 430,390 |
| Others | 3,262 | 3,230 | 3,172 | 3,147 | 3,123 | 3,111 | 3,092 |
| Active item Total | 2,969,346 | 2,969,346 | 3,422,222 | 3,648,326 | 3,919,177 | 4,139,694 | 4,358,319 |
| Inactive Data | 3,104,154 | 3,104,154 | 3,104,154 | 3,104,154 | 3,104,154 | 3,104,154 | 3,104,154 |
| Grand Total | 6,073,500 | 6,282,645 | 6,526,376 | 6,752,480 | 7,023,331 | 7,243,848 | 7,462,473 |
| Increase in number of items (year-on-year) | 211,395 | 209,145 | 243,731 | 226,104 | 270,851 | 220,517 | 218,625 |
| Rate of increase (year-on-year) | 103.61% | 103.44% | 103.88% | 103.46% | 104.01% | 103.14% | 103.02% |

Table 2.3-2 JICFS Classification Code System <Example: 110109: Salt>

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

which assists each user (consumer) to input merchandise information that they purchased, into the application.

One typical usage example is illustrated as follows; A user scans a barcode on a product they purchased with their smartphone camera.

Then, the app automatically shows the user the product name and product category if the product data is registered in JICFS/IFDB and collects the merchandise information at the same time.

The product information in JICFS/IFDB includes JICFS - classification codes (Table 2.3-2) that indicate product categories.

These codes are used as search keys for extracting the necessary product groups, and as aggregate keys for grouping similar products for data analysis.

The JICFS - classification is revised as necessary.

In March 2014, minor changes were made for OTC drugs.

2.4 GEPIR

GEPIR is a unique, internet-based service that gives access to the basic contact information on GS1 Company Prefix licensees. Since 2003, GS1 Japan provides GEPIR service in Japanese and English on the GS1 Japan website.

In 2007, a GLN location search function was added to GEPIR by GS1 Japan, followed by GTIN information

display services in 2013. In March 2017, the upgrade to GEPIR version 4.0 was completed.

With GEPIR version 4.0, GS1 member companies' basic information can be searched by the company's name, GTIN, GLN, and other GS1 identification keys.

Currently, GEPIR is used by many companies, with more than two million annual access.

Figure 2.4-1 Example of GS1 Japan search result

The screenshot displays the GEPIR search interface. On the left, there are search methods: GTIN, GLN, Other GS1 Keys, and Party Name. A 'Search by Barcode (GTIN)' section is active, showing a search for '4569951116179'. Below this are search filters for 'Trade Item Ownership' and 'Trade Item Info'. The main search results area shows 'Number of Hits: 1'. The 'Company Information' table lists details for GS1 Japan, including its contact information and various identification numbers (GS1 Company Prefix, GLN, etc.).

| No. | Entity GLN | Company Information | Contact information | GS1 Company Prefix | GLN Information |
|-----|---------------|--|---------------------|---|-----------------|
| 1 | 4569951110009 | 一般財団法人流通システム開発センター GS1 Japan 〒107-0062 東京都港区南青山1-1-1新青山ビル東館9F JP | http://www.dsri.jp/ | 4512345 456995111 456995112 4912345 4987000 499687 | GLN List |

Information Provider: GS1 Japan(4569951110009)

2.5 GPC Translation and OECD Product Recall portal

Global Product Classification (GPC) is a product classification developed and managed by GS1. GPC is a required attribute when registering product information into data pools of the Global Data Synchronisation Network (GDSN). As of December 2019, the development of 40 broad categories including Food/Beverage/Tobacco, Kitchenware and Tableware, Beauty/Personal Care/Hygiene, and Pet Care/Food have been completed and released on the GS1 website <www.gs1.org/gpc>.

Multilingualisation has been progressing, with translations into 25 languages, including Japanese,

which are available on the GS1 website.

Recently, there have been needs raised to use GPC for other purposes than GDSN. The OECD-managed recall portal website has adopted GPC for its product categorisation.

The aim of this portal site is to facilitate efficient sharing of international product safety information in multiple languages, as a response to current trends in global trading. The portal site started operation in October 2012 in English and French with the participation of U.S., Australia, Canada, and EU countries. Japan also joined in January 2015, providing product recall

Figure 2.5-1 The GlobalRecalls portal showing Japanese products subject to recall

The screenshot shows the GlobalRecalls portal interface. At the top, there is the OECD logo and navigation links for RSS, Administration, English, Français, 日本語, and Español. Below this is a blue navigation bar with 'Global portal on product recalls', 'Home', 'The portal', and 'Dashboard'. A search bar is present with 'Japan' entered and a 'Search' button. On the left, there is a sidebar with 'Records found: 92' and a category list including Audio Visual/Photography, Automotive, Building Products, Clothing, Communications, Computing, Electrical Supplies, Footwear, Fuels/Gases, and Home Appliances. The main content area displays a table of recall records.

| Date | Picture | Product name | Jurisdiction of recall | Economy where made | Language | Authorities link |
|------------|---------|--|------------------------|------------------------------|----------|----------------------|
| 2020-09-09 | | WHILL Personal Electric Vehicles, Model CI | United States | Chinese Taipei | English | Link |
| 2020-07-16 | | Passenger car; Honda; Civic, CR-V and HR-V | Portugal | Mexico | English | Link |
| 2020-05-28 | | Pickup truck; Mazda; B-Series | Portugal | Japan | English | Link |
| 2020-05-12 | | Tablet | Japan | China (People's Republic of) | English | Link |
| 2020-04-09 | | Passenger car; Honda; Accord, Civic, CR-V, Integra, Logo, Shuttle | Portugal | Japan | English | Link |
| 2020-03-31 | | Travel adaptor; DRND; Travel adaptor / World Travel Adapter | Poland | China (People's Republic of) | English | Link |
| 2020-03-13 | | Line 6 Relay G10 Digital Wireless Guitar Systems and USB Charging Cables | Japan | | English | Link |
| 2020-02-03 | | Wine Cooler | Japan | China (People's Republic of) | English | Link |

information of Japanese products, as well as adding a link to the Japanese-language version on the top page of the site.

We expect the more recall-related information is supplied by OECD member to this site, the more GPC utilisation will be expanding.

2.6 Ryutsu BMS (Business Message Standards)

The use of EDI in the retail sector in Japan started with the Electric Ordering System (EOS) using the **JCA Protocol**(*1), a standard data communication protocol drawn up in 1980 by the Japan Chain Stores Association (JCA). In the 1990s and thereafter, EDI also came to be adopted for business processes other than ordering.

Furthermore, in the 2000s, based on Efficient Consumer Response (ECR) and Quick Response (QR) procedures, Ryutsu Business Message Standards (known as **Ryutsu** (*2) BMS) were established for the purpose of achieving improved information sharing between retailers and suppliers.

✓ (*1) **JCA Protocol**: The standard communications protocol for electronic ordering, established in 1980 by the Japan Chain Stores Association (JCA). The communication circuits available for the protocol are public circuits (2,400 bps) and DDX circuits (9,600 bps), and it cannot transmit Kanji and images. DDX circuits are packet-type

communication services that use telephone circuits.

(*2) **Ryutsu**: Ryutsu is a Japanese word that means the entire supply and demand chain, which typically consists of three groups of Manufacturers, Wholesalers, and Retailers.

2.6.1 Development of Ryutsu BMS

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

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

- Low speed
- Inability to deal with Kanji characters and images
- The necessary communication equipment was discontinued

- Difficulty in adding new data fields due to a fixed length data format
- Message formats that differed from retailer to retailer

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

2.6.2 Outline of Ryutsu BMS

Ryutsu BMS defines the followings:

<Communication infrastructure>

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

- Server-to-Server Protocols: ebMS and AS2
- Client-to-Server Protocol: **JX Protocol**(*1)

In addition, the guidelines for secure internet communications are prepared, and the use of certificate authority that meets the requirements of the guidelines is recommended.

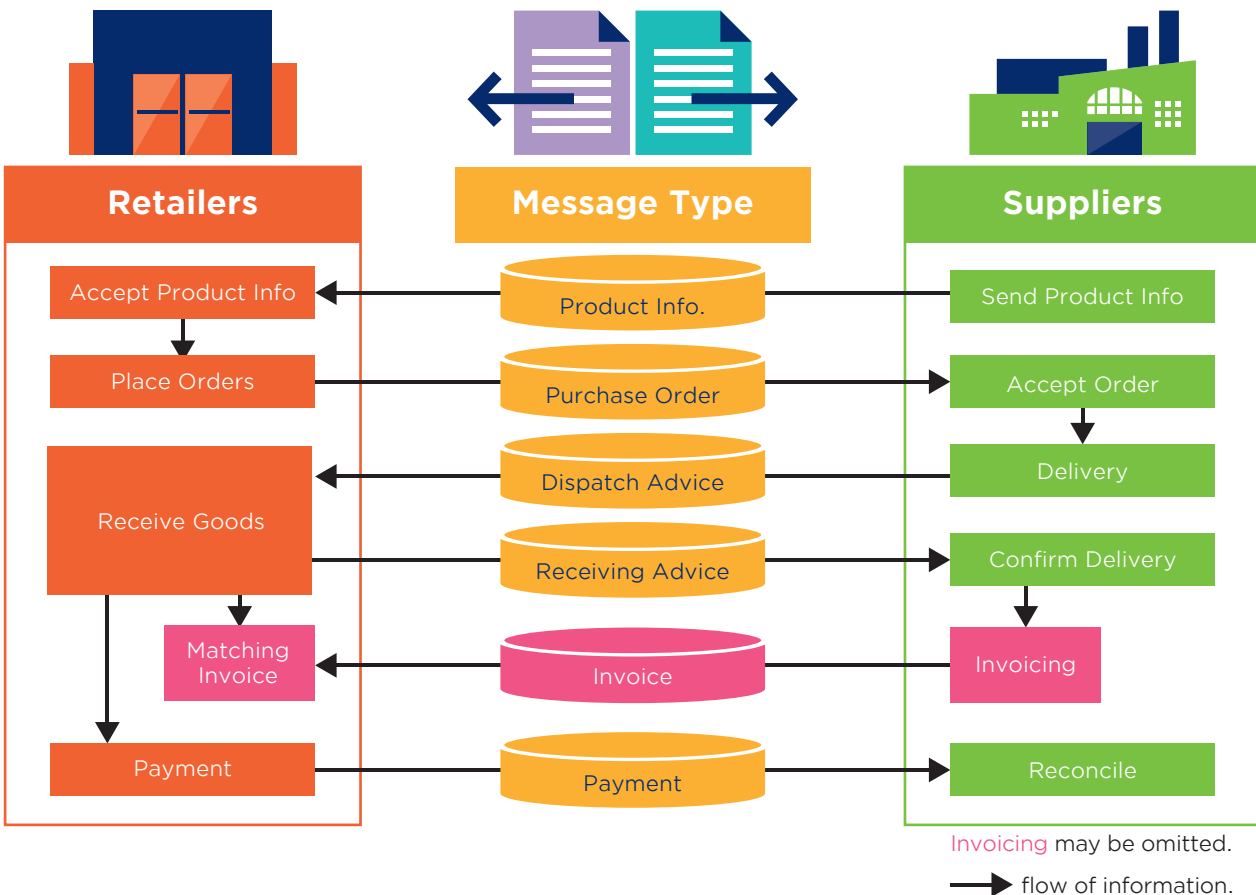
✔ (*1) **JX Protocol**: The communications protocol for transmitting messages from a client terminal to a corresponding server on a TCP/IP network. Using the international SOAP-RPC standard, the protocol realises functions that are equivalent to those of the J Protocol. The JX Protocol has become a standard communications protocol for exchanging EDI messages between clients and servers within Ryutsu BMS.

<Standard Messages>

There are 2 types of messages:

- Basic messages
 - Intended for use at supermarkets, drugstores, etc., the 28 basic messages were published based on the Order to Cash business model. In 2010, retailers and the apparel industry worked together to develop a system of peer-to-peer product information data messages.
- Department store messages
 - Japanese department stores have unique transaction models, which are different from those of other retailers. For example, they register a merchandise purchase when the merchandise has been actually sold; and also they need to manage the pre-ordering

Figure 2.6.2-1 Typical turnaround business processes and Ryutsu BMS Messages between retailers and suppliers



of seasonal gifts for the Japanese custom of giving gifts twice a year (in the summer and at the year's end).

Therefore, the department stores use 27 unique messages in their transactions.

2.6.3 Efforts to Promote Ryutsu BMS

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

- Trainings and seminars:

GS1 Japan has been offering a wide range of training courses from introductory to advanced implementation courses. Some of these courses are

available as e-learnings. We also hold seminars to introduce the best practices to Ryutsu BMS users and solution providers.

- Promotional materials:

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

2.6.4 Users' Commitments to Ryutsu BMS

In 2020, 218 retailers and 227 wholesalers or manufacturers have already adopted or intend to adopt Ryutsu BMS. The details of this survey are described in Table 2.6.4-1.

Table 2.6.4-1 Number of companies with their names made public (As of April 2020)

Retailers

| Classification | Implemented | Planning to Implement | Subtotal |
|-----------------------------------|-------------|-----------------------|------------|
| 1. Supermarket | 148 | 9 | 157 |
| 2. Department Store | 9 | 2 | 11 |
| 3. Drug Store | 25 | 1 | 26 |
| 4. Home Improvement Store | 4 | 1 | 5 |
| 5. Co-operative Federation | 4 | 0 | 4 |
| 6. Storage-type Membership Store | 1 | 0 | 1 |
| 7. Voluntary Chain Headquarters | 1 | 0 | 1 |
| 8. Discount Store | 4 | 0 | 4 |
| 9. Cooperative Chain Headquarters | 8 | 1 | 9 |
| Total | 204 | 14 | 218 |

Wholesalers/Manufacturers

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

2.7 Multilingual Product Information Service

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

✓ (*1) **The Collaborative Council of Manufacturers, Wholesalers, and Retailers:** The council was established in collaboration with manufacturers, wholesalers, and retailers of consumer goods, aiming to foster significant innovation and improvement of the supply chain management, and to enhance the industry’s competitiveness for contribution to better people’s lives. As of April 2020, 22 manufacturers, nine wholesalers, and 22 retailers have been acting as the active council members.

2.7.1 Background and Objectives

The number of foreign visitors to Japan exceeded 30 million in 2018 and the Japanese government set a target to increase this to 60 million by 2030. However, there are a growing number of foreign visitors who feel dissatisfied or anxious when they shop in Japan since many products do not have any information in other languages than Japanese.

To address this situation, in 2016 the council started a project to establish a system to offer foreign visitors accurate product information, which is provided by the brand owners in various languages such as English, simplified and traditional Chinese, and Korean through

a smartphone application. Upon seeing the results of this project, GS1 Japan launched its multilingual product information service in 2018.

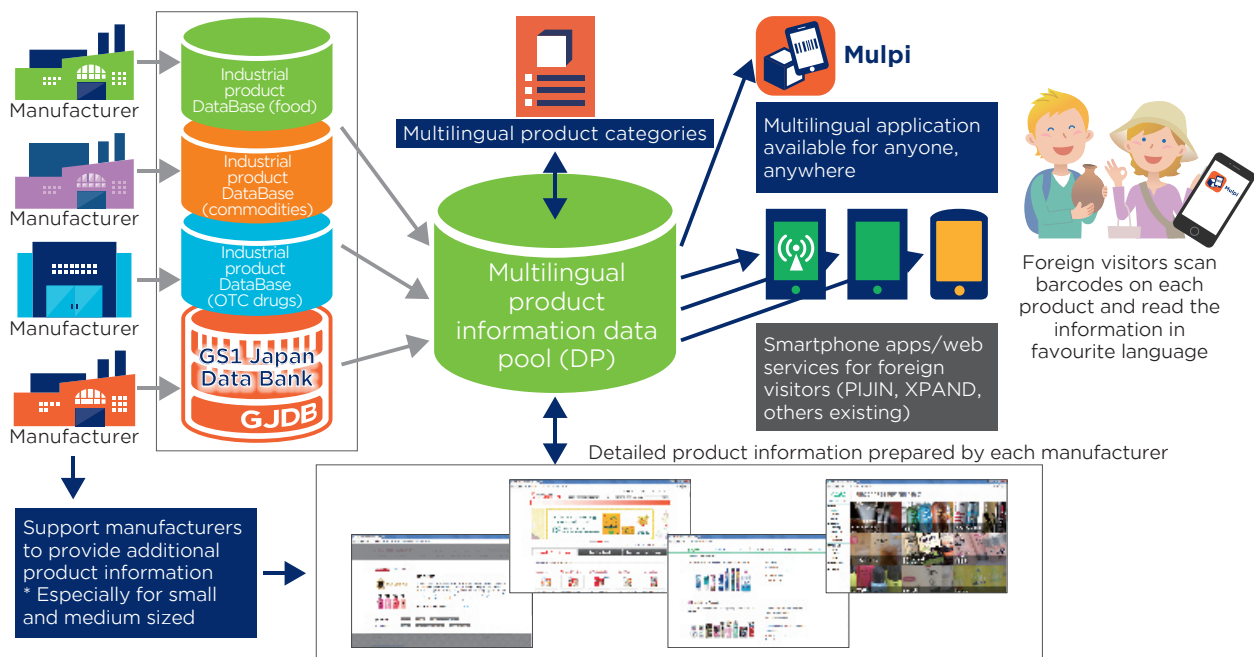
2.7.2 Service Overview

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

The user experience of the multilingual product information service is as follows:

- (i) When a user scans the barcode on a product using a smartphone, its basic product information including GTIN, **product name**(*1), image, and **category name**(*2) will be shown on the screen in a selected language. If there is a product website prepared by the brand owners, Mulpi automatically displays the webpage.
- ✓ (*1) **product name:** Product names are in Japanese.
- (*) **category name:** Category names classified by JICFS (See 2.2).
- (ii) As a communication infrastructure for accurate

Figure 2.7.2-1 Overview of the multilingual product information service



product information provided by each brand owners, the multilingual product information DP will be available for other applications provided by related service providers. GS1 Japan provides support to participating companies to create multilingual product information web pages in cooperation with translation agencies.

2.7.3 Expected Results

Expected results of this service are:

◇ Brand owners will:

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

◇ Retailers will:

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

◇ Foreign visitors to Japan will be able to:

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

2.7.4 Future Plan

As a part of the effort to assist the shopping experience of foreign tourists visiting Japan during the 2021 Tokyo Olympics and Paralympics, GS1 Japan plan to increase the number of products registered on the service and accelerate wider use of the application.

Figure 2.7.2-2 The multilingual product information service

Multi Language Product Information (Mulpi)

Mulpi instantly tells you what the product is.
Mulpi supports Japanese, English, Chinese and Korean.

The main feature of Mulpi is that **it shows product information provided by the brand owners.**

Simply scan barcode with Mulpi and get product information in multiple languages!

Brand owner

3. Community Engagement and Standard Implement

3.1 GS1 Japan Partners

In April 2015, GS1 Japan launched the program 'GS1 Japan Partners', mainly for solution providers. This program aims to share information on the latest trends and cases of systematisation, while promoting the systematisation of information and efficiency in the overall distribution industry with use of GS1 standards.

The number of members in fiscal year 2019 is 122, including many of the major solution providers in Japan. (Table 3.1-1)

Table 3.1-1 Membership Structure (as of March 2020)

| Sales | | Members |
|--------------------------|----------------|------------|
| Less than | JPY 1 billion | 51 |
| JPY 1 billion - | JPY 10 billion | 28 |
| JPY 10 billion - | JPY 1 trillion | 40 |
| JPY 1 trillion and above | | 3 |
| Total | | 122 |

Table 3.1-2 Events in Fiscal Year 2019

| When | Events | Main themes |
|----------------|---------------------|---|
| June 2019 | 1st Regular Seminar | <ul style="list-style-type: none"> • 'Simple Scan Goes Global -Utilising GS1 Standards in Healthcare-' • 'Utilisation of RFID in the Healthcare Industry' • 'Establishment of a Traceability Data Bank at NCGM -GS1 Standards Transform Healthcare: Healthcare Big Data, Relationship Between AI and GS1 Standards-' |
| July 2019 | Special Seminar | <ul style="list-style-type: none"> • 'Renewing the GS1 Company Prefix Registration Management System' • 'Promoting GS1 Japan Data Bank (GJDB) and Addressing the Internetisation: Increasing Product Information Needs with Digitisation and Internetisation' |
| September 2019 | 2nd Regular Seminar | <ul style="list-style-type: none"> • 'GS1-128 Symbol Utilisation at Miyagi Children's Hospital' • 'Current Status and Future Challenges of the Product Information Database for OTC Drugs' • 'RPA Utilisation in Wholesale Industry (KOKUBU Group)' • 'Logistics Innovation through RFID Applications' |
| November 2019 | 3rd Regular Seminar | <ul style="list-style-type: none"> • 'Product Information Trends in Europe and New Developments in GS1' • 'Overview and Future Prospects of "Q-PITS", a New Service for Quality Product Information Exchange' • 'GS1 Standards for Supply Chain and Web -Overview of "GS1 Digital Link", a New Way of Representing GS1 Standard data, and a look ahead, and Future Prospect' |
| March 2020 | 4th Regular Seminar | <ul style="list-style-type: none"> • 'Efforts to Improve Logistics in the Distribution Industry' <p>* Cancelled due to the spread of the COVID-19</p> |

3.2 Supply Chain Standards Management and Promotion Council

Supply Chain Standards Management and Promotion Council was founded in April 2009 by various industry groups and businesses to help promote efficient supply chain information system in Japan's retail sector.

The activities of the council include maintaining and promoting Ryutsu BMS (see 2.5), which was initially developed with the support of the Ministry of Economy, Trade and Industry (METI). At present, GS1 Japan acts as the secretariat of the council.

The Council held its inaugural General Assembly in Tokyo in April 2009. The council consists of trade associations of manufacturers, distributors, and retailers in the consumer goods industry as full members. As of May 2020, the council is composed of 49 full member organisations. In 2020, the council is being operated with the following structure:

3.2.1 Organisational Structure

(i) General Assembly

The Council holds general assembly annually at which it shares and confirms activity results of the previous fiscal year, and approves the new agendas for the new fiscal year. The officers of the council are also appointed at the general assembly for two-year terms.

(ii) Executive Committee

The role of the executive committee includes making important decisions on the council's management, such as admitting new members, establishing and abolishing working groups, and appointing working group members. In 2020, the committee is composed of representatives from 14 full member organisations.

(iii) Working Groups (Task force)

The Council has three working groups as follows (See Figure 3.2.1-1).

(iii.i) Message Maintenance Working Group

This group maintains and manages Ryutsu BMS messages except product master data, and various guidelines.

The work is done in response to requests from full members for changes or additions to the established standards.

The group examines such requests, decides on the steps to be taken, revises the relevant guidelines, and then publishes as a new standard.

In 2012, the group set the standard for product images (image size, resolution, filenames etc.) for online supermarket, and published a guideline.

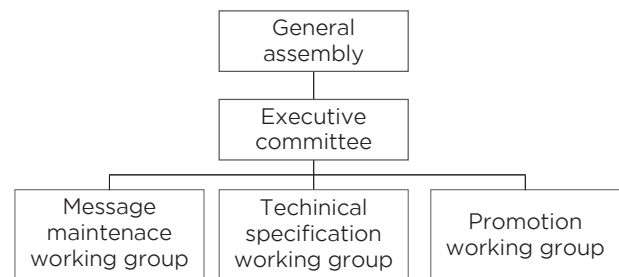
(iii.ii) Technical Specification Working Group

This group maintains and manages the guidelines for network technology and information processing technology used for exchanging the standard messages of Ryutsu BMS via communications circuits.

(iii.iii) Promotion Working Group

This group examines and implements steps to encourage wider adoption of Ryutsu BMS among SMEs. The group also monitors 'off the standard usage' of Ryutsu BMS.

Figure 3.2.1-1 Organisational structure of the council



3.2.2 Activities for Promotion and Increasing Adoption

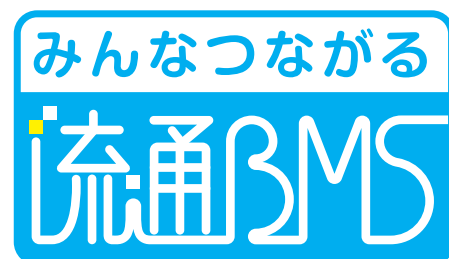
GS1 Japan and the council take various efforts to encourage wider use of the Ryutsu BMS.

For details see 2.6.

3.2.3 Registration of Ryutsu BMS Trademark

GS1 Japan has registered Ryutsu BMS logo to be used for products and services that comply with Ryutsu BMS specifications. As of May 2020, there are 132 products accredited and permitted to use the logo.

Figure 3.2.3-1 Ryutsu BMS Logo



3.3 GS1 Healthcare Japan

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

As of September 2020, GS1 Healthcare Japan consists of 110 members.

3.3.1 Work Groups

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

- **International Standards and Regulations Study Work Group**

Research on the trends in international regulations and standardisation.

- **Medical Solutions Study Work Group**

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

- **Planning and Public Relations Group**

Promotion of GS1 standards to medical institutions.

3.3.2 Topics in 2019/20

Amendments to the Law on Medical Devices and Drugs were promulgated in December 2019. Barcode labelling, which had been asked as a recommendation by the MHLW's notice, will be a mandatory requirement. The deadline for the implementation has been set for 1 December 2022. Along with this stricter barcode labelling requirement, it is also expected for medical facilities to propel the utilisation of barcodes.

GS1 Healthcare Japan holds its annual conference every spring to share GS1 barcode use cases at medical institutions and the latest regulatory information.

GS1 Healthcare Japan had been preparing for the conference with about 500 participants on 5 March 2020, but regrettably this conference have cancelled due to the widespread of the COVID-19.

This was really disappointing because the conference was scheduled to include a lecture from the MHLW on the amendments to the law.

3.4 ICT-Oriented Wholesale Industry Study Group

In 1985, GS1 Japan set up a Study Group aimed at promoting the computerisation of the wholesale industry, with GS1 Japan as the secretariat of the Group.

In Japan's supply chain system, wholesalers play a major role, as most manufactured products are delivered to retailers through wholesalers.

The Study Group is operated primarily by wholesalers dealing in Fast Moving Consumer Goods (FMCG) in different industries (foods, household products, etc.), and the membership is 51 companies as of March 2020.

The Group is further divided into several sub-working groups, according to themes related to the members' interests, and each sub-working group holds monthly meetings.

Other activities of the Study Group include an Annual Forum, which is the biggest event, and 'future solution study tour', which is carried out a few times a year.

With its mission of 'Initiatives toward total optimisation of Japanese distribution' the Study Group worked on

Topic 1. Labour-saving and Personnel-saving for Logistics Efficiency Improvement

The Group studied about labour-saving and personnel-saving by improving the logistics operation efficiencies, based on the two main points; (i) ASN (Advanced Shipping Notice) utilised receiving operation improvement, and (ii) AI utilised ordering operation improvement.

(i) ASN utilised receiving operation improvement: The Group studied the following two points and proposed specific measures.

- Reduction of personnel in charge of product receiving
- Reduction of truck drivers' waiting time

(ii) AI utilised ordering operation improvement: The Group studied the following three points and proposed specific measures.

- Reduction of workloads with optimising ordering and inventory operations
- Reduction of needless work by diminishing disposal losses and product returns
- Less dependency on individual skills for the tasks with streamlining the ordering process in addition to the above two points

Topic 2. Promotion of Ryutsu BMS Utilisation between Retailers and Wholesalers

The issues, specifically highlighted, are the new purchase tax credit formula which will go into effect in 2023, and the termination of legacy telecom line service in 2024. Therefore, the Group reaffirmed the necessity of efforts to encourage broader use of a new EDI standard known as Ryutsu BMS (2.6). The Group has sorted out challenges to the spread of Ryutsu BMS in the wholesale and retail industries then drafted a proposal for measures to address these challenges. As a specific deliverable, the Group created a document (flier) for promotion of Ryutsu BMS. The Group is planning to utilise this flier at briefings within wholesale companies, and, in addition, distribute to retailers through wholesalers.

Topic 3. Wholesalers' Collaboration — Common Platform Scheme for All Companies —

As a result of discussions on collaboration in the wholesale industry, the Group has reached to the conclusion that the Group should not develop individual systems for each company in areas that cannot be differentiated from one another, but instead build a system that allows joint use across the industry to lower the costs. Following the conclusion, the Group selected 'The Common Platform Scheme for the Wholesale Industry' as the theme for this year. Several functions had been mentioned that the Group would like to develop as elements of the common platform service for joint use, but this time the Group focused on the following two themes and started studying.

- 'Standardisation of data exchange means between wholesalers (e.g. format)'
- '“Quotation System” scheme for joint use among Wholesalers'

Topic 4. Knowledge Sharing Scheme to Link Wholesalers — From Competition to Co-creation (both Pronounced as 'Kyou-Sou' in Japanese, Creating the Rhythmic Pattern) —

The Group had been discussing the possibility of using new IT to improve the efficiency of wholesalers as a whole in the future, and in the meeting, it was pointed out that one of the impediments to improving business operations was the absence of information sharing about business operations. Therefore, by focusing on 'knowledge sharing', The Group ultimately decided to delineate a common platform that could be called as an aggressive IT platform. The wholesaler sharing platform would be the flower blooming in the new era, as a pioneer of cross-company data aggregation and as a source of new ideas utilising data.

Topic 5. Ideal Wholesalers

There are harsh realities of the wholesale industry, which are, in particular, low operating profit margins and rising logistics costs. In order to break through this and realise a sustainable wholesale future, the Group recognised the challenge is to reduce logistics costs by utilising possessed large amounts of data (EDI, POS, etc.) throughout the entire supply chain. Therefore, the Group took this on board as the theme of the study. The Group has concluded that the standardisation of format and codes used across companies and industries, and the establishment of an underlying foundation for data utilisation is essential for overall optimisation, and then the Group formulated a road map for this.

Figure 3.4-1 ICT-Oriented Wholesale Study Group



3.5 The Collaborative Council of Manufacturers, Wholesalers, and Retailers

The Collaborative Council of Manufacturers, Wholesalers, and Retailers was formally established in May 2011 for the purpose of improving the nation's industrial competitiveness, and of contributing to an affluent standard of living for the nation's citizens, through extensive innovations and improvements in supply chain management. The Council has clearly stated the purpose of the Council's activities in our 'Vision' .

Member companies can participate in the Council based on their endorsement and support of the Vision by their executive management, and an agreement to act while upholding the Vision.

GS1 Japan, and the Distribution Economics Institute of Japan, jointly serve as the Secretariat of the Council. Under the auspices of both Institutes, 15 founding member companies have participated in the Council, and have continued to hold preparatory meetings since May 2010. They have discussed the adoption of the Vision and how to manage the full-scale activities of the Council with the active support of the Ministry of Economy, Trade and Industry (METI). They have also established working groups and continued discussions on three specific themes: 'Reducing Returns' ; 'Optimising Deliveries' ; and 'Promoting the Introduction of a new EDI standard known as Ryutsu BMS (2.6)' . In May 2011, the founding companies announced the formal establishment of the Council in the 'Collaborative Forum of Manufacturers, Wholesalers, and Retailers' .

In FY2019, the Council is committed to further discussions of the theme of 'Optimisation of Logistics' , organising its past deliverables, and sorting out common challenges to be shared among manufacturers, wholesalers, and retailers.

Meanwhile, through the Product Information Multiple Languages project, which has been promoted since FY2015, the data pool and the application for mobile devices were developed for practical use based on the knowledge obtained through the past demonstration experiments. They have been released in March 2018. (2.7 for further information)

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

The General Meeting in 2019 was held in July 2019.

The executive management of each company has confirmed the responsibility for their activities, and will lead specific on-site improvements and innovations within the company.

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



3.6 Study Group for Information Systems in Food, Beverage, and Alcohol Industry

It is important for food producers to cooperate with wholesalers, as they are positioned between retailers and product manufacturers.

This is a voluntary study group of liquor and processed food businesses established in 1983 with the aim of studying the most appropriate information systems for use between food producers and wholesalers.

The study group has about 60 corporate members that are Japan’s leading companies in 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 standardisation of B2B data exchanges among companies in the supply chain. It holds regular quarterly meetings where best practices of members’ information systemisation are introduced. It also

organises seminars on the latest topics inviting outside lecturers and study tours to pioneering businesses.

Figure 3.6-1 Regular meeting



3.7 Supports and Trainings

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

- (i). Introduction to Barcodes
- (ii). Introduction to EPC/RFID
- (iii). Introduction and Implementation of Ryutsu BMS
- (iv). Introduction to Barcode for Prescription Drugs and Medical Devices

This year, the school style courses had been hard to hold because of the COVID-19. We are considering utilisation of distant online courses.

Table 3.7-1 GS1 Japan Seminar Statistics in 2019

| Courses | Held | Attendees |
|--|------|-----------|
| Introduction to Barcodes | 21 | 543 |
| Introduction to EPC/RFID | 4 | 111 |
| Introduction and Implementation of Ryutsu BMS | 8 | 162 |
| Introduction to Barcode for Prescription Drugs and Medical Devices | 5 | 132 |

3.7.1 Introduction to Barcodes

This scheduled program offers basic knowledge on GS1 barcodes accelerating GTIN usage and application.

Classroom locations are Tokyo and Osaka, and participants, mostly new members who want to learn

about barcodes from the basic and to know how to display barcode to products, are expected to obtain general knowledge of barcodes. ‘On-site training’ is also available accordingly upon applicant’s request at specified place and time.

In addition to the classroom courses above, e-learning program was introduced in 2016 enabling learners free from location and time constrain.

Due to the COVID-19, we have not been able to hold school-style seminars, but in contrast, access to e-learning courses has been increased.

Figure 3.7.1-1 Classroom of ‘Introduction to Barcodes’



3.7.2 Introduction to EPC/RFID

This program targets EPC/RFID beginners in order them to obtain deeper understandings of the approach of its utilisations. Classroom locations are Tokyo and Osaka, and participants are expected to learn about those characteristics of RFID, successful implementation case examples of EPC/RFID systems,

GS1 EPC/RFID standards, and other related information. After the lecture sessions, a demonstration is carried out simulating shipping and receiving item check, conducting RFID batch reading. Participants can also get hands-on experience of the simulation.

E-learning is also available with the title of 'Guide to EPCIS System Construction', which is helpful for EPCIS system construction.

3.7.3 Introduction and Implementation of Ryutsu BMS

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

This program is intended for persons related to CPG supply chain, especially toward to persons assigned newly to information system department, or considering Ryutsu BMS introduction.

In addition, it is also useful for solution providers or consultants to support user companies.

Main classroom locations are Tokyo and Osaka, and its e-learning version was launched in May 2017.

Next step program is also prepared as e-learning explaining key points how effectively introduce Ryutsu BMS complying with the standard specifications under the title of 'Ryutsu BMS Implementation Course'.

3.7.4 Introduction to Barcode for Prescription Drugs and Medical Devices

This program provides practical knowledge about the guidelines released by the Ministry of Health, Labour and Welfare (MHLW), which specifies barcode marking

rules for prescription drugs and medical devices. This program is designed for the people who are working at drug or medical device manufacturers, wholesalers, medical service providers and related solution providers, and the classroom is scheduled regularly in both Tokyo and Osaka.

3.7.5 Junior Job Shadowing

Another but not least unique activity from GS1 Japan is the 'Job Shadowing' for middle and high school students. Throughout the several hours of lectures and trainings, the future GS1 users learn about barcodes and GS1 standards.

This program is supported by 'Specified Non-profit Corporation - School Support Center' as one of their school support activities.

Unfortunately, it was not held this year due to the COVID-19, but we would like junior and senior high school students to learn about GS1 activities through their experiences possibly next year.

Figure 3.7.5-1 Students learning and experiencing scanning barcodes/RFIDs: 2019



3.8 Publications and PR Tools to Promote GS1 Standards

3.8.1 Guidelines

GS1 Japan has been providing the materials about the GS1 standards to retailers, wholesalers, products manufacturers, and Solution Providers.

The information is published in order to promote GS1 standards, and most of materials are also available on our website.

Followings are the examples of our current publications:

- (i) Guide to Barcodes for Beginners

With a focus on GTIN, this book provides an easy-to-understand explanation of the various product identification keys and barcodes that are the basis of distribution information systems.

Figure 3.8.1-1 Guide to Barcodes for Beginners



(ii). JAN Symbol Marking Manual

It explains the technical basics of the EAN (called as JAN in Japan) symbol, such as the structure, size, and colour, as well as some examples for the practical symbol creation to avoid wrong symbols which need long time to read, or are difficult to read. It is intended not only for brand owners who are responsible for displaying EAN symbols, but also for companies providing equipment and services related to printing, acquiring and verifying symbols.

Figure 3.8.1-2 JAN Symbol Marking Manual



(iii). Barcode Guideline for UDI

Regarding barcode labelling of medical devices, there are subtle differences between the GS1 standard and the rules of each country including Japan. As barcodes are increasingly used for import and export products, it is important for brand owners to correctly understand the regulations and industry rules of each country in addition to the international GS1 standard. This guide provides the basics of the GS1 standards as well as points to be aware of when distributing the healthcare products in Japanese markets. Furthermore, for exporting parties, it gives fundamental knowledge about the U.S. FDA UDI regulations.

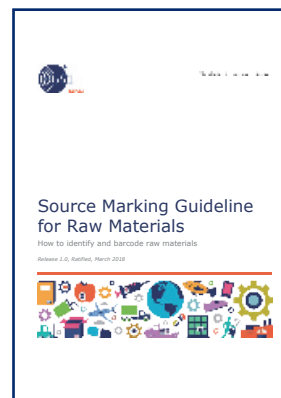
Figure 3.8.1-3 Barcode Guideline for UDI



(iv). Source Marking Guideline for Raw Materials

This guideline defines standard data items such as GTIN, lot number and date information (e.g. expired date) to be displayed and recommended barcodes on raw materials. We hope that this guideline will encourage the use of barcodes with globally unique identification (i.e. no overlapping with others) anywhere in the world, helping make supply chains more efficient and improve food safety and security.

Figure 3.8.1-4 Source Marking Guideline for Raw Materials



(v). GS1 AIDC Standards Conformity Check Guide

It offers the fundamental knowledge about GS1 standards and checklists to check if the products conform with the GS1 standards for generating, printing, and reading the barcodes.

It can be used to confirm the functions of various barcode related products and as reference material for GS1 standards.

Figure 3.8.1-5 GS1 AIDC Standards Conformity Check Guide



3.8.2 Periodical Publications

We also issue two periodical publications 'GS1 Japan News' and 'GS1 Japan Review'.

GS1 Japan News, issued every two months provides latest information about GS1 Standards, events and trends of industry standardisations.

3. Community Engagement and Standard Implement

GS1 Japan Review, issued twice a year provides more detailed information including use cases in addition to the above.

These were redesigned to follow the GS1 Brand Manual this fiscal year.

Figure 3.8-2-1 GS1 Japan Review (Left) and GS1 Japan News (Right)



3.8.3 Videos and Mobile App 'GS1 Japan Scan'

Moreover, GS1 Japan creates educational videos about GS1 Standards including EAN and ITF symbol, GTIN, EPC/RFID, GS1 Healthcare, and Ryutsu BMS.

Besides the above videos, we also created many other

informative educational videos which are mostly used during classroom programs.

All the videos are available both on our website and the 'GS1 Japan channel' on YouTube.

<www.youtube.com/channel/UCWaw3zjmvvjytr0x4KLK1hw>

In addition to the above, in 2018, GS1 Japan has developed a mobile app, named 'GS1 Japan Scan', to promote utilisation of the GS1 standards.

This app allows users to simply check their products' barcodes to provisionally find if they meet GS1 standards and the Japanese industry rules for medical devices, pharmaceuticals, or food raw materials.

Figure 3.8-4 GS1 Japan Scan



3.9 Events

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

3.9.1 GS1 Japan Annual Seminar

The information exchange meeting for 2019 was held at the Meiji Kinenkan on 5 December and was attended by more than 300 people from a variety of organisations and businesses.

In the special lecture, Mr. Takayoshi MIURA, Chairman of the Board of Terumo Corporation, gave a lecture

Figure 3.9.1-1 Mr. MIMURA in his special lecture



titled 'Terumo's efforts in China and the management that I have practiced in China' on three themes: the overview of Terumo Corporation, the history of Terumo's business in China, and what I have practiced and been aware of in China.

For details of the lecture, please refer to the Ryukkai Center News No. 227. (Japanese)

3.9.2 GS1 B2C (Mobile) Seminar

This annual seminar is targeting mainly the audiences from the following industries for the purpose of sharing trends of GS1 standardisation activities and excellent use cases of leading companies around the world.

- Mobile marketing professionals in manufacturing, retail, and distribution industries
- System planners and developers including software service providers for mobile devices

The theme of GS1 B2C (Mobile) Seminar 2019 was 'Omni-channel environment business innovation utilising GS1 Standards 2019 - Increasing adaptations of GS1 standards for online sales', and number of

participants was counted to about 40.

Nikkei MJ posted an article about the seminar on their web site.

<www.mj-tenporyoku.com/special/article/156>

Figure 3.9.2-1 GS1 B2C (Mobile) Seminar



3.9.3 EPC RFID FORUM

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

In 2019, we had held the 15 th forum titled ‘Challenges to Diversifying Consumer Needs, and RFID Tags (EPC/RFID) - “Progress of 100 billion RFID Tags Project by METI” and Use Cases in Apparel Industry’ . In this forum, in addition to the presentation on the progress of the METI-led RFID and data utilisation projects in the

Figure 3.9.3-1 15th EPC RFID FORUM



retail industry, JOHN LEWIS, a major British department store, and Takashimaya, a major Japanese department store, had reported on their use of RFID tags.

3.9.4 RETAILTECH JAPAN 2019

GS1 Japan provides a special collaboration with ‘RETAILTECH JAPAN’ , a major exhibition which is held usually in March annually. RETAILTECH JAPAN, hosted by the Nikkei, is an exposition of distributional information systems, where 200 or more exhibitors attract some 130,000 attendees, targeting distributors, retailers, and food service providers.

GS1 Japan, with cooperation from the Ryutsu (Distribution) Business Message Standards (BMS) council, set up a booth in this exposition and worked actively to promote the Ryutsu BMS and GS1 standards.

In addition to exhibition panels and video screenings, a distribution solution seminar is held at the corner set up in the distribution BMS zone to introduce details in an easy-to-understand manner. During the exposition period GS1 hosts a prepared seminar to report the latest trends of distribution systems using GS1 standards, and gathers more than 200 participants usually.

We regret but, this exhibition had also been cancelled.

Figure 3.9.4-1 RETAILTECH JAPAN 2018 GS1 booth



4. About GS1 Japan

4.1 Overview

GS1 Japan was founded in 1972 mainly through the efforts of the then Ministry of International Trade and Industry (present Ministry of Economy, Trade and Industry or METI) as the Distribution System Research Institute (DSRI), a non-profit organisation for promoting the introduction of distribution systems, and have been striving for rationalising and increasing the efficiency of supply chains. As the first mission, we conducted studies on the standardisation of national product codes for apparel and grocery. We started to endeavour structuring the system of standard product codes and symbols for Japanese industries with studying and incorporating those systems already standardised in both Europe and the U.S. Then in 1978, we had been accepted as an EAN Association member as the first outside European member.

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 feasibility had been tested obtaining cooperation from Kikkoman Corporation (a soy sauce manufacturer), Coca-Cola (Japan) Company, Limited, and Kai Corporation (a cutlery manufacturer), while retailers had begun to conduct storefront practical demonstration experiments of the POS (Point-of-Sale) 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.

One of the most remarkable milestones for expanding the source marking usage was the fact that, in 1982, SEVEN-ELEVEN JAPAN CO.,LTD., a leading convenience store chain, had adopted POS system at all of its stores (1,650 stores, which increased to about 20,900 in 2020). Another remarkable contribution to POS system usage expansion was the consumption tax introduction in 1989. As the next step, GS1 Japan had set up study groups for selected industries in 1980s, for the purpose of studying business process improvement together with the industry members. Those processed foods, sporting goods, consumer electronics, and books and magazines industry members had positively participated in the study groups. One of the study groups, wholesalers' study group, was set up under the leadership of representatives from various industries. These study groups soon came to cooperate in the

adoption of EAN standards.

Needless to mention, 'share' is coming after 'identify' and 'capture' .

GS1 Japan had started the Japan Item Code File Service (JICFS) service in the middle of 1980s, which contains cleaned and proofed product data, and which is worthwhile utilising for POS data collection and provision.

During the 1990s, GS1 Japan studied product codes, EDI (Electronic Data Interchange) messages and other subjects in cooperation with the apparel industry under METI-funded study of QR (Quick Response) system. Retailers used to assign their proprietary code to apparel products. We, together with apparel industry members, studied the way of realising EAN source marking to apparel products, and which brought about the successful result. It was also a notable accomplishment that the GS1-128 was employed for the labelling of wooden crates, containing various products, delivered to department stores. JEDICOS (Japan EDI for Commerce Systems), one of the Japanese EDI message standards, development was accomplished, which had been developed on the basis of EANCOM to meet with Japanese business practices.

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 realising this service, the GS1-128 was adopted on the bills for the public utility charges. And the meat industry decided to adopt the GS1- 128 for its standard labels for traceability. The identification needs are not only for the physical objects but also for non-physical products.

In the second half of the 2000s, GTIN had been employed to identify non-physical music streaming services, and online and mail-order companies started using GTIN for those identifications and management.

4.1.1 EPC/RFID

In the period between 2003 and 2009, we had been supporting METI's RFID pilot projects for the purpose of finding and solving issues in conducting introduction of RFIDs into various industries (apparel, footwear, books, home appliances, international logistics, etc.), and then these efforts took us to have built the foundation for the promotion of RFID utilisation.

In 2004, we established EPCGlobal Japan and have

been actively developing industries' awareness of RFID, along with striving to increase the number of members.

4.1.2 Healthcare

In 2009, GS1 Healthcare Japan was established as a voluntary group for promoting GS1 Standards in healthcare sector. We are confident that all the continuous efforts including issuing guidelines which illustrate how GS1 systems can be applied to medical device management, and all other pioneering efforts, which had been conducted together with the healthcare industry stakeholders since the late 1990s, had led us to set up the GS1 Healthcare Japan.

4.1.3 New Developments

In the area of EDI, GS1 Japan created an XMLformat

EDI standard (Ryutsu BMS) for supporting domestic business practices and has worked to spread the standard together with 49 trade organizations. There have been new developments in several recent years. As public interest in food safety has increased, GS1 Japan started a joint study with Japanese supermarkets and supply chain stakeholders on the use of GS1 DataBar including pilot testing of the symbol with discounted price or sell-by-hour information at retail stores.

In 2015, GS1 Japan launched the program 'GS1 Japan Partners' , aiming to share information and best practices among solution providers.

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

4.2 GS1 Japan in Brief

We joined GS1 in 1978 and obtained the GS1 prefix '490 - 499' . We subsequently applied for an additional prefix in 1992, obtaining the prefix '450 - 459' .

Initially, GS1 Japan was allocating seven-digit GS1 Company Prefixes, but since January 2001, we have started to allocate nine-digit GS1 Company Prefixes, given the rise in the number of registered companies and a recommendation from GS1.

Currently, in principle, GS1 Japan allocates nine-digit GS1 Company Prefixes to new applicants.

When a company continues to use the GS1 Company Prefix, it needs to renew the registration every three years. In the fiscal year 2019, we had 11,625 new registrations.

As of the end of March 2020, the number of registrations for GS1 Company Prefixes reached 137,909.

Recently, sole proprietorships are leading the number of registrations, accounting for around 40% of the new registrations in the first half of fiscal year 2019. That number, compares to about 20% nine years ago, is indicating a significant increase. Another trend to highlight is the increase in registrations for selling products online.

The top product categories, handled by newly registered companies in the first half of FY 2019, are as follows.

1) Sundries (19%), 2) Processed foods (16%), 3) Fresh foods and Apparel (7% each), 5) Health foods (6%).

The top category was sundries, at 19%. About half of the businesses which selected sundries were sole proprietors, and 62% cited online shopping malls as their primary business partners. It shows the smaller

businesses are entering into the online sales of sundries, which are relatively easy to procure and manufacture.

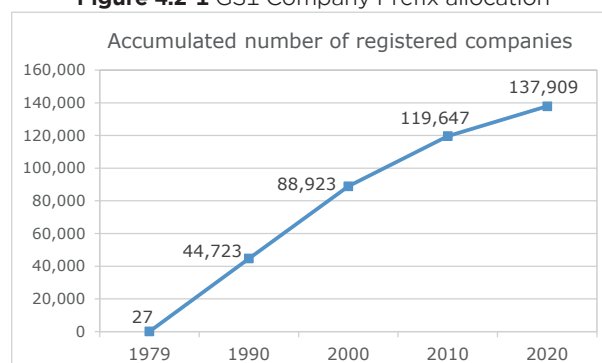
The third category was 'Apparel' with 7 %, which had been more than doubled since 2010. This is because the apparel sales, owing to online shopping malls such as Amazon, are rapidly increasing. Of the businesses those had chosen the 'Apparel' category, 56% mentioned Amazon as their primary customer.

In addition, while the ratio was not so high, healthcare products had also been securing steady figures since 2009.

This is because the Ministry of Health, Labour and Welfare (MHLW) is promoting the labelling of GTINs and other information on medical devices and supplies with barcodes. GS1 Japan organises regular courses to promote correct understanding of the GS1 standards and also holds courses at designated locations around the country for those industries upon request.

The number of GS1 Company Prefix registration in Japan is expected to grow continuously, given the expansion of online sales channels and the increase of source marking in areas with low source marking rates, such as apparel and specialty products.

Figure 4.2-1 GS1 Company Prefix allocation



4.3 History

| Year | Events |
|------|---|
| 1972 | DSRI (Distribution Systems Research Institute) is established. (Shinagawa-ward) |
| 1973 | 'Supply Chain Information Network Models' is developed. |
| 1974 | 'Standardised Transaction Code' study is conducted by industry types. |
| | 'Distribution & System' (quarterly journal) first issue is published. |
| 1975 | 'Distribution System Design Engineer Course' and 'Distribution System Management Course' are started. |
| 1977 | 'Distribution Information System Study Committee' is started. |
| | 'Distribution Code Centre' is opened. (predecessor of GS1 Japan) |
| | Allocation of 'Common Supplier Codes' is started. |
| 1978 | Joins 'EAN International' and GS1 Prefix '49x' is allocated. |
| | EAN/U.P.C. symbol is defined as a JIS standard (JIS B 9550). |
| | Allocation of 'GS1 Company Prefix' starts. |
| 1979 | First POS pilot is conducted at a supermarket in Tokyo (Tatsumi Chain, Tokyu Store). |
| 1980 | 'JCA (Japan Chain Stores Association) Protocol' for Retail industry is defined. |
| | Second POS pilot is conducted at some selected supermarkets (AEON, Co-op Supermarket, etc.) |
| 1981 | Third POS pilot is conducted at some selected retailers (Kasmi Convenience Store (now called: United Supermarkets Holdings Inc.), Kishi Shopping Center (now called: Watahan & Co., Ltd.), etc.). |
| 1982 | 'DCC Japan Newsletter' (later, the name changed to 'RYUKAI Centre News' (Bi-monthly)) is first published. |
| | SEVEN-ELEVEN JAPAN (Convenience Store) has introduced POS. |
| | Moves office to another location in Shinagawa-ward. |
| 1983 | 'Low-interest financing for POS introduction' is provided to SME retailers by the government (Small and Medium Enterprise Agency). |
| | 'Study Group for Information System in Food, Beverage, and Alcohol Industry (called F-KEN)' is started. |
| 1985 | 'Study Group for ICT-Oriented Wholesale Industry (called OROSHI-KEN)' is started. |
| | Ryutsu POS Database Service (RDS) Project is started. |
| | JICFS (Jan Item Code File Service) Project is started. |
| | Ito-Yokado (GMS) has introduced POS. |
| 1987 | Sporting Goods Information System Study Group has started. |
| | 'Common Magazine Code' registration has started. |
| | ITF symbol is defined as a JIS standard (JIS X 0502). |
| | Utility bills collection service system using multiple EAN-13 symbols has started. |
| 1988 | Practical application experiment of JICFS (JAN Item Code File Service) is started. |
| | Standard EOS (Electronic Ordering System) using GTIN-13 is developed. |
| | EAN International General Assembly is held in Tokyo. |
| | U.P.C. Company Prefix application service is started. |
| 1989 | 'Consumption Tax' is introduced. |
| | Research and pilots of POS are conducted for small retailers located in the shopping street. |
| 1990 | Barcoding in Book Industry. |
| 1991 | Multi-functional card for regional shopping streets is developed. |
| | Daiei (GMS) has employed EAN codes for all the products. |
| 1993 | Heiwado (supermarket in Western Japan) has first employed ITF as a retailer. |
| 1995 | Acquires additional GS1 Prefix '45x' and started allocating '45x' GS1 Company prefix. |
| 1996 | Study for computerisation of trade for perishables is started. |
| | Moves office to Minato-ward. |
| | Open Business Network (OBN) system is developed. |
| | Code-128 is defined as a JIS standard (JIS X 0504). |
| 1997 | Heiwado (Supermarket) has begun CRP (continuous replenishment program) with several manufacturers. |
| | JEDICOS, Japanese version of EANCOM, has been developed. |
| 1999 | GLN utilisation study and verification test are started to realise efficient and effective distribution system for the supply chain. |

| Year | Events |
|------|--|
| 2001 | Nine-digit GS1 Company Prefix has been introduced. |
| 2002 | EAN International's Asia Pacific Regional Meeting is held in Tokyo. |
| 2003 | GEPiR operation has started. |
| | EPCglobal subscription is started. |
| | GS1 Application Identifier is defined as a Japanese Industrial Standard (JIS X 0531). |
| 2004 | 'EPCglobal Japan' is set up. |
| 2005 | MHLW (Ministry of Health, Labour & Welfare) issues a guideline 'Implementation Guideline for Bar Code Labelling of Prescription Drugs,' which uses GS1 barcodes. |
| | Promotion of GTIN is started. |
| | 'DCC Japan' changed name to 'GS1 Japan'. |
| 2006 | GTIN is employed for online sales of music products. |
| | EPCglobal Board Meeting is held in Tokyo. |
| 2007 | Ryutsu BMS (Japanese XML-EDI Message Standards) is published. |
| | GS1 Mobile Conference held in Tokyo. |
| | 'GS1 DataBar Study Group' is set up. |
| 2008 | 'GS1 Healthcare conference' is held in Tokyo. |
| | Several Online Shopping companies have started to use JICFS/IFDB. |
| 2009 | 'Supply Chain Standards Management and Promotion Council' is set up. |
| | 'GS1 Healthcare Japan' is set up. |
| 2010 | Verification test of GS1 DataBar utilisation is conducted at some supermarkets. |
| | Mobile Day Seminar is held in Tokyo. |
| 2011 | Mobile Day event held in Tokyo. |
| | 'The Collaborative Council of Manufacturers, Wholesalers, and Retailers' is started. |
| 2012 | 'GS1 Advisory Council Meeting' is held in Tokyo. |
| | Changes corporate form to 'General Incorporated Foundation'. |
| 2013 | GS1 B2C mobile and omnichannel Seminar are held in Tokyo. |
| 2014 | 'GS1 Healthcare Japan UDI and Prescription Drug Traceability Seminar' is held in Tokyo. |
| 2015 | 'GS1 Japan Partners' membership has started. |
| | 'GS1 Company Prefix' application on the web has started. |
| 2017 | 'Source Marking Guideline for Raw Materials' is published. |
| | Hosts 'GS1 Asia Pacific Regional Forum' in Tokyo. |
| 2020 | 'GS1 AIDC standards conformity check guide' is published. |
| | Moves office to Minami-Aoyama. (Minato-ward: Current location) |
| | Renewed 'RYUKAI Centre News' design and changed the name to 'GS1 Japan News'. |
| | Renewed 'Distribution & System' design and changed the name to 'GS1 Japan Review'. |

5. References

5.1 Statistics on Japanese Retail Industry

Table 5.1-1 Number of establishments, number of employees, annual sales of goods and sales floor space. (2016)

| | Stores | | Annual sales (JPYm) | | Employees (*1) | Store space (k sq m) |
|--|----------------|---------------|---------------------|---------------|------------------|----------------------|
| | | Ratio (%) | | Ratio (%) | | |
| Department stores and general merchandise supermarkets | 1,590 | 0.16 | 12,634,774 | 8.71 | 330,992 | 17,936,735 |
| Miscellaneous retail trade, general merchandise (with less than 50 employees) | 1,536 | 0.16 | 244,574 | 0.17 | 11,663 | 376,657 |
| Dry goods and cloth stores, Bedding stores | 14,711 | 1.49 | 483,722 | 0.33 | 51,131 | 936,835 |
| Men's clothing | 17,419 | 1.76 | 1,531,789 | 1.06 | 83,324 | 2,960,425 |
| Women's and children's clothing | 64,013 | 6.46 | 4,961,255 | 3.42 | 322,551 | 8,860,879 |
| Footwear | 10,523 | 1.06 | 750,596 | 0.52 | 48,953 | 943,847 |
| Other miscellaneous woven fabrics, apparel, apparel accessories and notions stores | 32,709 | 3.30 | 2,259,523 | 1.56 | 170,047 | 5,061,745 |
| Grocery | 27,442 | 2.77 | 20,552,114 | 14.16 | 1,025,225 | 22,364,400 |
| Vegetable and fruit | 18,397 | 1.86 | 970,860 | 0.67 | 84,882 | 808,690 |
| Meat and poultry | 11,058 | 1.12 | 728,575 | 0.50 | 58,530 | 322,363 |
| Fresh fish | 13,705 | 1.38 | 728,352 | 0.50 | 56,326 | 334,111 |
| Liquor | 32,233 | 3.26 | 1,564,253 | 1.08 | 95,169 | 1,118,052 |
| Confectioneries and bakeries | 61,922 | 6.25 | 2,392,327 | 1.65 | 369,508 | 1,655,102 |
| Other miscellaneous food and beverage stores | 132,479 | 13.38 | 14,631,846 | 10.08 | 1,280,037 | 9,250,911 |
| Motor vehicles | 83,887 | 8.47 | 17,366,166 | 11.97 | 565,227 | 2,982,778 |
| Bicycles | 11,207 | 1.13 | 240,079 | 0.17 | 27,204 | 667,430 |
| Machinery and equipment (except motor vehicles and bicycles) | 46,272 | 4.67 | 9,507,282 | 6.55 | 271,385 | 9,241,211 |
| Furniture, fixture and 'tatami' mat | 20,138 | 2.03 | 1,550,041 | 1.07 | 91,251 | 5,107,010 |
| Household utensil stores | 15,225 | 1.54 | 450,699 | 0.31 | 46,310 | 742,967 |
| Medicine and toiletry stores | 89,453 | 9.03 | 12,654,688 | 8.72 | 605,676 | 10,363,924 |
| Farming supply | 11,938 | 1.21 | 1,626,018 | 1.12 | 59,051 | 1,567,625 |
| Fuel | 48,240 | 4.87 | 12,123,560 | 8.36 | 305,230 | 539,003 |
| Books and stationery | 34,847 | 3.52 | 3,157,908 | 2.18 | 438,421 | 3,773,623 |
| Sporting goods, toy, amusement goods and musical instrument | 22,347 | 2.26 | 2,247,270 | 1.55 | 137,588 | 4,506,737 |
| Camera, watch and spectacles stores | 20,175 | 2.04 | 1,133,785 | 0.78 | 77,848 | 1,136,958 |
| Stores, n.e.c. (not elsewhere classified) | 102,095 | 10.31 | 8,340,300 | 5.75 | 562,834 | 21,783,675 |
| Total | 990,246 | 100.00 | 145,103,822 | 100.00 | 7,654,443 | 135,343,693 |

✓ (*1): The number of Employees is the total of 'sole proprietors', 'unpaid family employees', 'paid executives', and 'regular employees', thus 'temporary employees' are not included.

(*2): Total and breakdown may not match as the figures include establishments that could not methodically be classified.

The source: Ministry of Economy, Trade and Industry of Japan

<www.stat.go.jp/english/data/e-census/2012/index.html>

Table 5.1-2 Top 30 Wholesalers in Japan (2019)

| 2019 | 2018 | Companies | Head office | Annual sales (JPYm) | Growth (%) | Industries |
|------|------|---|-------------|---------------------|------------|-----------------------------------|
| 1 | 1 | MEDIPAL HOLDINGS CORPORATION | Tokyo | 3,253,079 | 2.20 | Pharmaceutical |
| 2 | 2 | Alfresa Holdings Corporation | Tokyo | 2,698,511 | 2.20 | Pharmaceutical |
| 3 | 3 | Mitsubishi Shokuhin Co., Ltd. | Tokyo | 2,654,698 | 1.30 | Food |
| 4 | 4 | SUZUKEN CO., LTD. | Aichi | 2,213,478 | 3.80 | Pharmaceutical |
| 5 | 5 | NIPPON ACCESS,INC. | Tokyo | 2,154,392 | 1.10 | Food |
| 6 | 6 | KOKUBU GROUP CORP. | Tokyo | 1,891,676 | 0.30 | Food |
| 7 | 7 | TOHO HOLDINGS CO., LTD. | Tokyo | 1,263,708 | 3.40 | Pharmaceutical |
| 8 | 8 | KATO SANGYO CO., LTD. | Hyogo | 1,063,219 | 5.40 | Food |
| 9 | 9 | MITSUI FOODS CO.,LTD. | Tokyo | 820,200 | 0.00 | Food |
| 10 | 10 | ARATA CORPORATION | Tokyo | 796,227 | 5.50 | Household items, Medical supplies |
| 11 | 11 | TOMOSHIA HOLDINGS CO.,LTD. | Tokyo | 740,630 | 3.10 | Food |
| 12 | 12 | ITOCHU-SHOKUJIN Co.,Ltd. | Osaka | 661,244 | (0.90) | Food |
| 13 | 13 | VITAL KSK HOLDINGS, INC. | Tokyo | 562,505 | 0.50 | Pharmaceutical |
| 14 | 14 | NIPPON SHUPPAN HANBAI INC. | Tokyo | 560,474 | 1.90 | Food |
| 15 | 16 | YAMAE HISANO Co., Ltd. | Fukuoka | 522,102 | 6.80 | Food |
| 16 | 15 | NIHONSHURUIHANBAI CO., LTD. | Tokyo | 515,922 | (5.50) | Books, Music, Video, Instruments |
| 17 | 17 | Forest Holdings inc. | Oita | 471,132 | 3.50 | Pharmaceutical |
| 18 | 18 | TOHAN CORPORATION | Tokyo | 408,249 | (2.00) | Books, Music, Video, Instruments |
| 19 | 20 | Starzen Co., Ltd. | Tokyo | 351,356 | 0.00 | Food |
| 20 | 19 | CHORI CO.,LTD. | Osaka | 329,360 | (7.60) | Textile |
| 21 | 22 | YAMABOSHIYA Co., Ltd. | Osaka | 276,052 | 4.40 | Food |
| 22 | 24 | OHKI HEALTHCARE HOLDINGS CO., LTD. | Tokyo | 274,790 | 7.30 | Pharmaceutical |
| 23 | 21 | ITOCHU Food Sales and Marketing Co., Ltd. | Tokyo | 269,243 | (3.40) | Food |
| 24 | 23 | SHINMEI Co., LTD. | Hyogo | 256,239 | (3.00) | Food |
| 25 | 25 | ONWARD HOLDINGS CO., LTD. | Tokyo | 248,233 | 3.20 | Textile |
| 26 | 27 | HOKUYAKU TAKEYAMA Holdings,Inc. | Hokkaido | 243,102 | 3.40 | Pharmaceutical |
| 27 | 26 | HAPPINET CORPORATION | Tokyo | 233,347 | (2.90) | Toy |
| 28 | 29 | TOHO Co.,Ltd | Hyogo | 231,266 | 6.20 | Food |
| 29 | 28 | MARUICHI CO.,LTD. | Nagano | 230,722 | 2.30 | Food |
| 30 | 30 | FUJIMOTO HOLDINGS CO., LTD. | Tokyo | 210,900 | (0.60) | Household items, Medical supplies |

The source: The Nikkei Marketing Journal, 12 August 2020

5. References

Table 5.1-3 Top 25 Retailers in Japan (2019)

| 2019 | 2018 | Companies | Business | Annual sales (JPYm) | Growth (%) |
|------|------|--|--------------------|---------------------|------------|
| 1 | 1 | AEON CO., LTD. | Holding Company | 8,604,207 | 1.01 |
| 2 | 2 | Seven & i Holdings Co., Ltd. | Holding Company | 6,644,359 | (2.16) |
| - | - | AEON RETAIL Co.,Ltd. | Supermarket | 2,290,548 | 4.81 |
| 3 | 3 | FAST RETAILING CO., LTD. | Holding Company | 2,192,500 | 2.93 |
| 4 | 5 | Amazon Japan G.K. (*2) | Mail-order | 1,744,378 | 14.27 |
| 5 | 4 | YAMADA DENKI CO., LTD. | Specialty Shop | 1,611,538 | 0.68 |
| 6 | 7 | Pan Pacific International Holdings Corporation | Holding Company | 1,328,874 | 41.14 |
| - | - | Ito-Yokado Co., Ltd. | Supermarket | 1,185,147 | (4.13) |
| 7 | 6 | Isetan Mitsukoshi Holdings Ltd. | Holding Company | 1,119,191 | (6.48) |
| 8 | 9 | Takashimaya Co., Ltd. | Departmental Store | 919,094 | 0.68 |
| 9 | 8 | H2O RETAILING CORPORATION | Holding Company | 897,289 | (3.19) |
| 10 | 10 | BICCAMERA INC. | Specialty Shop | 894,021 | 5.92 |
| - | - | SEVEN-ELEVEN JAPAN CO.,LTD. | Convenience Store | 887,625 | 1.61 |
| - | - | UNIQLO CO., LTD. | Specialty Shop | 872,957 | 0.95 |
| - | - | WELCIA HOLDINGS CO.,LTD. | Holding Company | 868,280 | 11.44 |
| - | - | WELCIA YAKKYOKU CO.,LTD. | Specialty Shop | 810,308 | 11.81 |
| 11 | 17 | TSURUHA HOLDINGS INC. | Holding Company | 782,447 | 16.22 |
| 12 | 11 | Izumi Co., Ltd. | Supermarket | 744,349 | 1.67 |
| 13 | 12 | EDION Corporation | Specialty Shop | 733,575 | 2.08 |
| 14 | 13 | Lawson, Inc. | Convenience Store | 730,236 | 4.22 |
| 15 | 14 | LIFE CORPORATION | Supermarket | 714,683 | 2.29 |
| 16 | 16 | K'S HOLDINGS CORPORATION | Specialty Shop | 798,222 | 15.83 |
| - | - | Don Quijote Co., Ltd. | Specialty Shop | 704,810 | 5.82 |
| 17 | 15 | Yodobashi Camera Co.,Ltd. | Specialty Shop | 704,611 | 1.65 |
| - | - | United Super Markets Holdings Inc. | Holding Company | 691,660 | (0.38) |
| 18 | 22 | Valor Holdings Co., Ltd. | Holding Company | 678,096 | 19.82 |
| 19 | 19 | Nitori Holdings Co., Ltd. | Holding Company | 642,273 | 5.61 |
| 20 | 20 | Sundrug Co.,Ltd. | Specialty Shop | 617,769 | 5.05 |
| 21 | 23 | COSMOS Pharmaceutical Corporation | Specialty Shop | 611,137 | 9.52 |
| - | - | Sogo & Seibu Co., Ltd. | Departmental Store | 600,148 | (2.46) |
| 22 | 21 | Matsumotokiyoshi Holdings | Specialty Shop | 590,593 | 2.54 |
| - | - | Isetan Mitsukoshi Ltd. | Departmental Store | 583,203 | (8.05) |
| - | - | MAXVALU NISHINIHON CO., LTD. | Supermarket | 542,989 | 97.50 |
| 23 | 27 | Sugi Holdings Co., Ltd. | Holding Company | 541,964 | 10.95 |
| 24 | 25 | Nojima Corporation | Specialty Shop | 523,968 | 2.13 |
| 25 | 24 | SHIMAMURA Co.,Ltd. | Specialty Shop | 522,894 | (4.40) |



(*1): Companies with a hyphen (-) in the rank column are consolidated subsidiaries whose parent companies are listed on the top 500 list.

(*2): The total annual sales is calculated using the annual average exchange rate.

The source: The Nikkei Marketing Journal, 22 July 2020

Table 5.1-4 Top 10 Convenience Store Chains in Japan (2019)

| 2019 | 2018 | Shop Names | Companies | Groups | Annual sales (JPYm) | Shops |
|------|------|--|------------------------------|-----------------------------------|---------------------|--------|
| 1 | 1 | 7-Eleven | SEVEN-ELEVEN JAPAN CO.,LTD. | Seven & i Holdings Co., Ltd. | 5,010,273 | 20,916 |
| 2 | 2 | FamilyMart | FamilyMart Co.,Ltd.(*1) | FamilyMart UNY Holdings Co., Ltd. | 2,965,052 | 15,686 |
| 3 | 3 | LAWSON (*1) | Lawson, Inc. (*1) | Mitsubishi Corporation | 2,820,070 | 14,444 |
| 4 | 4 | MINI STOP | MINISTOP Co., Ltd. | AEON CO., LTD. | 314,002 | 1,997 |
| 5 | 5 | Seicomart | Secoma Company Limited | Independent | 181,271 | 1,177 |
| 6 | 6 | Daily YAMAZAKI | YAMAZAKI BAKING CO.,LTD.(*1) | Independent | 170,592 | 1,414 |
| 7 | 7 | NewDays | JR East Retail Net Co.,Ltd. | East Japan Railway Company | 100,094 | 497 |
| 8 | 8 | POPLAR, SEIKATSU SAIKA, Kurashi House, Three Eight | POPLAR. CO., LTD | Independent | 46,297 | 473 |
| 9 | 9 | Hasegawa Store Company, Ltd. | Hasegawa Store Company, Ltd. | Secoma Company Limited | 1,926 | 12 |
| 10 | 10 | Orange Box, OreBo Station | Ohtsu-ya Co., Ltd. | Independent | 1,649 | 7 |

-  The survey was conducted with chain convenience stores whose business hours are 14 hours and more, and floor spaces are less than 250 square meter.

Ranking is based on the sales excluding area-franchise-chain-stores. Overseas stores are excluded.

(*1) Data for companies operating area-franchise-chain-stores include neither those stores' Annual sales nor the number of Stores. LAWSON figures include data of its area-franchise-chain-stores.

The source: The Nikkei Marketing Journal, 26 August 2020

5. References

Table 5.1-5 Top 25 Speciality Store Chains in Japan (2019)

| 2019 | Companies | Business Areas | Sales | | Ordinary Income (JPYm) | Stores |
|------|---|---|-----------|------------|------------------------|--------|
| | | | (JPYm) | Growth (%) | | |
| 1 | YAMADA DENKI CO., LTD. | Home electrical appliances | 1,405,451 | 0.6 | - | 675 |
| 2 | UNIQLO CO., LTD. | Casual clothing | 872,957 | 0.9 | - | 817 |
| 3 | WELCIA YAKKYOKU CO.,LTD. | Chemists & Medicines | 810,308 | 11.8 | 39,770 | 1,800 |
| 4 | K'S HOLDINGS CORPORATION | Home electrical appliances | 708,222 | 2.8 | 37,040 | 504 |
| 5 | Don Quijote Co., Ltd. | General warehouse stores | 704,810 | 5.8 | 26,355 | 322 |
| 6 | Yodobashi Camera Co.,Ltd. | Home electrical appliances | 704,611 | 1.7 | 60,157 | 23 |
| 7 | EDION Corporation | Home electrical appliances | 669,436 | 2.7 | 11,967 | 1,124 |
| 8 | Nitori Holdings Co., Ltd. | Furniture | 642,273 | 5.6 | 109,522 | 607 |
| 9 | COSMOS Pharmaceutical Corporation | Chemists & Medicines | 611,136 | 9.5 | 27,262 | 993 |
| 10 | Matsumotokiyoshi Holdings Co., Ltd. | Chemists & Medicines | 590,593 | 2.5 | 39,985 | 1,717 |
| 11 | Sugi Holdings Co., Ltd. | Chemists & Medicines | 541,964 | 11.0 | 31,473 | 1,287 |
| 12 | SHIMAMURA Co.,Ltd. | Women's and children's clothing | 516,973 | (4.4) | 23,551 | 2,158 |
| 13 | BICCAMERA INC. | Home electrical appliances | 516,078 | 5.9 | 12,185 | 43 |
| 14 | Daiso Industries Co., Ltd. | 100-yen shops | 501,500 | 5.4 | - | 3,493 |
| 15 | Cainz Co., Ltd. | DIY stores & Motor car accessories stores | 429,857 | 4.4 | 25,992 | 219 |
| 16 | Trial Company ,Inc. | General warehouse stores | 427,867 | 8.4 | 3,806 | 251 |
| 17 | Sundrug Co.,Ltd. | Chemists & Medicines | 412,601 | 3.4 | 26,561 | - |
| 18 | Joshin Denki Co.,Ltd. | Home electrical appliances | 410,402 | 2.8 | 7,776 | 239 |
| 19 | FUJI YAKUJIN CO., LTD. | Chemists & Medicines | 396,886 | 2.8 | - | - |
| 20 | Culture Convenience Club Co.,Ltd. (TSUTAYA) | Books & Stationeries | 353,264 | (2.0) | 12,695 | - |
| 21 | KOHNAN SHOJI CO., LTD. | DIY stores & Motor car accessories stores | 340,729 | 4.1 | 19,461 | 372 |
| 22 | Ryohin Keikaku Co.,Ltd. (MUJI) | Daily necessities | 336,247 | 8.5 | 41,166 | 437 |
| 23 | KOMERI Co.,Ltd. | DIY stores & Motor car accessories stores | 335,276 | 0.7 | 16,684 | 1,197 |
| 24 | GEO HOLDINGS CORPORATION | Musical instruments & CDs | 305,057 | 4.3 | 10,765 | 1,938 |
| 25 | AIN HOLDINGS INC. | Chemists & Medicines | 292,615 | 6.2 | 16,822 | 1,151 |

The source: The Nikkei Marketing Journal, 5 August 2020

Table 5.1-6 Sales by Type of Merchandise in Department Stores (2019) [unit: JPYk]

| | 2018 | 2019 | Growth (%) | Ratio (%) |
|----------------------------|----------------------|----------------------|---------------|---------------|
| Apparel | 1,772,568,199 | 1,683,368,867 | (5.03) | 29.25 |
| Men's | 385,936,434 | 364,325,084 | (5.60) | 6.33 |
| Women's | 1,131,838,956 | 1,079,109,870 | (4.66) | 18.75 |
| Children's | 135,506,048 | 127,115,455 | (6.19) | 2.21 |
| Others | 119,286,761 | 112,818,458 | (5.42) | 1.96 |
| Personal items | 785,950,064 | 767,274,225 | (2.38) | 13.33 |
| Accessories | 1,134,464,817 | 1,154,423,193 | 1.76 | 20.06 |
| Cosmetics | 560,443,540 | 571,378,903 | 1.95 | 9.93 |
| Jewelleries | 357,557,434 | 386,091,749 | 7.98 | 6.71 |
| Others | 216,463,843 | 196,952,541 | (9.01) | 3.42 |
| Household Items | 238,551,873 | 229,737,829 | (3.69) | 3.99 |
| Furniture | 61,430,067 | 62,441,370 | 1.65 | 1.09 |
| Home electrical appliances | 12,510,586 | 15,196,500 | 21.47 | 0.26 |
| Others | 164,611,220 | 152,099,959 | (7.60) | 2.64 |
| Foods | 1,622,922,048 | 1,591,521,903 | (1.93) | 27.66 |
| Fresh foods | 310,865,069 | 296,975,928 | (4.47) | 5.16 |
| Confectioneries | 455,936,240 | 456,654,989 | 0.16 | 7.94 |
| Delicatessen | 359,631,082 | 356,000,987 | (1.01) | 6.19 |
| Others | 496,489,657 | 481,889,999 | (2.94) | 8.37 |
| Restaurant | 152,611,723 | 147,004,618 | (3.67) | 2.55 |
| Services | 59,358,397 | 58,929,144 | (0.72) | 1.02 |
| Others | 120,575,470 | 122,455,185 | 1.56 | 2.13 |
| Grand total | 5,887,002,591 | 5,754,714,964 | (2.25) | 100.00 |
| Gift Vouchers | 143,529,232 | 130,282,481 | (9.23) | 2.26 |

✓ The sales of Gift Vouchers are excluded from the total sales.

The source: Japan Department Stores Association <www.depart.or.jp/store_sale/>

Table 5.1-7 Sales by Type of Merchandise in Chain Stores (2019)

| | 2018 | 2019 | Growth (%) | Ratio (%) |
|----------------------------------|----------------------|----------------------|----------------|---------------|
| Foods | 857,390,195 | 821,847,144 | (4.15) | 66.10 |
| Agricultural products | 122,328,961 | 115,273,995 | (5.77) | 9.27 |
| Livestock products | 100,577,851 | 96,030,589 | (4.52) | 7.72 |
| Fishery products | 77,340,727 | 72,763,881 | (5.92) | 5.85 |
| Delicatessen | 103,572,301 | 105,086,379 | 1.46 | 8.45 |
| Other foods | 453,570,355 | 432,692,300 | (4.60) | 34.80 |
| Apparel | 100,940,034 | 87,972,610 | (12.85) | 7.08 |
| Men's | 19,227,658 | 16,114,002 | (16.19) | 1.30 |
| Women's | 27,995,727 | 23,939,782 | (14.49) | 1.93 |
| Other apparels | 53,716,649 | 47,918,826 | (10.79) | 3.85 |
| Household items | 257,549,944 | 250,899,102 | (2.58) | 20.18 |
| Sundries | 99,323,882 | 96,882,397 | (2.46) | 7.79 |
| Healthcare & cosmetics | 37,216,307 | 33,965,859 | (8.73) | 2.73 |
| Furniture & interior accessories | 69,942,866 | 70,562,234 | 0.89 | 5.68 |
| Home electrical appliances | 11,513,552 | 10,860,868 | (5.67) | 0.87 |
| Other products | 39,553,337 | 38,627,744 | (2.34) | 3.11 |
| Services | 3,376,233 | 3,045,847 | (9.79) | 0.24 |
| Others | 79,574,131 | 79,482,796 | (0.11) | 6.39 |
| Total | 1,298,830,537 | 1,243,247,499 | (4.28) | 100.00 |

The source: Japan Chain Stores Association (56 member companies and 10,621 stores)

<www.jcsa.gr.jp/public/statistics.html>

Table 5.1-8 BtoC EC market size in Japan (2018)

| | | 2018 (JPYb) | EC Ratio (%) (*1) | 2019 (JPYb) | EC Ratio (%) | Growth (%) |
|-------------------------|--|----------------|----------------------|----------------|-----------------|---------------|
| Retail | Foods, beverages, liquors | 1,692 | 2.64 | 1,823 | 2.89 | 7.74 |
| | Home electrical appliances, audio & visual equipment, PC & peripherals | 1,647 | 32.28 | 1,824 | 32.75 | 10.75 |
| | Books, video & music software | 1,207 | 30.80 | 1,302 | 34.18 | 7.87 |
| | Cosmetics, healthcare | 614 | 5.80 | 661 | 6.00 | 7.65 |
| | Household items, furniture, interior accessories | 1,608 | 22.51 | 1,743 | 23.32 | 8.40 |
| | Apparels & accessories | 1,773 | 12.96 | 1,910 | 13.87 | 7.73 |
| | Motor vehicles, motorbike, parts etc. | 235 | 2.76 | 240 | 2.88 | 2.13 |
| | Office supplies, stationeries | 220 | 40.79 | 226 | 41.75 | 2.73 |
| | Others | 304 | 0.85 | 323 | 0.92 | 6.25 |
| | Total | 9,299 | 6.22 | 10,051 | 6.76 | 8.09 |
| Services | Travel | 3,719 | | 3,897 | | 4.79 |
| | Food & drinks | 638 | | 729 | | 14.26 |
| | Tickets | 489 | | 558 | | 14.11 |
| | Financing | 603 | | 591 | | (1.99) |
| | Beauty & barber | 493 | | 621 | | 25.96 |
| | Others (Healthcare, insurances, homes, educations) | 707 | | 771 | | 9.05 |
| | Total | 6,647 | | 7,167 | | 7.82 |
| Digital Contents | e-publication (Books & magazines) | 278 | | 336 | | 20.86 |
| | Charged music distribution | 65 | | 71 | | 9.23 |
| | Charged movie distribution | 148 | | 240 | | 62.16 |
| | On-line games | 1,449 | | 1,391 | | (4.00) |
| | Others | 98 | | 104 | | 6.12 |
| | Total | 2,038 | | 2,101 | | 3.09 |
| Grand Total | | 17,984 | | 19,319 | | 7.42 |



The '**EC Ratio**' means the ratio of EC market size to the amount of business transaction (Market size) including telephone, e-mail, and face-to-face based sales.

The source: METI (Ministry of Economy, Trade and Industry) 'Research on Infrastructure Development in Japan's Information-based Economy Society (E-Commerce Market Survey)'

<www.meti.go.jp/policy/it_policy/statistics/outlook/ie_outlook.html>

Table 5.1-9 Top 25 E-Commerce (B2C) Players in Japan (2018)

| 2018 | 2017 | Companies (Main Website) | Sales (JPYm) | Growth (%) | EC Ratio (%) | Main Products |
|------|------|--|--------------|------------|--------------|----------------------------|
| 1 | 1 | Amazon Japan G.K. < amazon.co.jp > (*1) | 1,528,100 | 14.30 | 100.00 | General |
| 2 | 2 | Yodobashi Camera Co.,Ltd < www.yodobashi.com > | 121,277 | 9.30 | 100.00 | Home electrical appliances |
| 3 | 3 | ZOZO, Inc. < zozo.jp > | 118,405 | 20.30 | 100.00 | Apparel |
| 4 | 16 | BICCAMERA INC. < biccamera.com > (*2) | 86,000 | 17.80 | 100.00 | Home electrical appliances |
| 5 | 11 | UNIQLO CO., LTD. < uniqlo.com > | 63,063 | 29.40 | 100.00 | Apparel |
| 6 | 7 | AEON CO., LTD. < aeonnetshop.com > (*3) | (*12)62,000 | - | 100.00 | Foods |
| 7 | 8 | Joshin Denki Co.,Ltd. < joshinweb.jp > | (*12)58,000 | - | 100.00 | Home electrical appliances |
| 8 | 6 | Dinos Cecile Co., Ltd. < dinos.co.jp > | (*11)57,074 | 4.40 | 53.00 | General |
| 9 | 9 | Japanet Takata Co.,Ltd. < www.japanet.co.jp/shopping > | (*12)57,000 | 5.90 | 28.00 | Home electrical appliances |
| 10 | 5 | Senshukai CO.,LTD. < bellemaison.jp > | (*12)55,000 | - | 67.00 | General |
| 11 | 13 | Dell Japan Inc. < dell.com > | (*12)53,000 | - | 100.00 | PC |
| 12 | 10 | Interman Corporation < asq.jp > | 51,395 | 23.10 | 100.00 | Household items |
| 13 | 12 | Ito-Yokado Co., Ltd. < iy-net.jp > (*4) | 48,134 | (1.20) | 100.00 | Foods |
| 14 | 15 | Jupiter Shop Channel Co.,Ltd. < shopch.jp > | (*12)47,700 | - | 30.00 | General |
| 15 | 14 | KITAMURA Co., Ltd. < kitamura.jp > (*5) | (*12)44,000 | - | 100.00 | Cameras |
| 16 | 18 | MOA Co.,Ltd. < premoa.co.jp > (*6) | 43,787 | 35.40 | 100.00 | Home electrical appliances |
| 17 | 17 | MouseComputer Co.,Ltd. < mouse-jp.co.jp > (*7) | 39,933 | 8.90 | 100.00 | PC |
| 18 | 20 | NITORI Co., Ltd. < nitori-net.jp/store > | 38,900 | 27.30 | 100.00 | Furniture, household items |
| 19 | 21 | Belluna Co., Ltd. < belluna.jp > (*8) | 32,789 | 11.50 | 26.00 | General |
| 20 | 19 | QVC Japan, Inc. < qvc.jp > | (*12)31,500 | - | 30.00 | General |
| 21 | 44 | YAMADA DENKI CO., LTD. < www.yamada-denkiweb.com > | (*12)30,000 | - | 100.00 | Home electrical appliances |
| 22 | 26 | Oisix ra daichi Inc. < www.oisix.com > (*9) | 29,619 | 19.40 | 100.00 | Foods |
| 23 | - | IRIS OHYAMA Inc. < www.irisplaza.co.jp > | (*12)29,000 | - | 100.00 | Household items |
| 24 | 28 | SEVEN-ELEVEN JAPAN CO.,LTD. < 7-11net.omni7.jp/top > | 27,998 | 5.50 | 100.00 | Foods |
| 25 | 32 | au Commerce & Life, Inc. < luxa.jp > (*10) | (*12)26,646 | 22.00 | 100.00 | General |

✓ (*1) Amazon Japan: Only the service charges and ad revenues from their marketplace tenants thus it is not the entire transactions on the web.

(*2) Bic Camera: Consolidated group net sales including Kojima and Sofmap.

(*3) AEON: Estimation of their digital business group sales mainly the online supermarket business.

(*4) Ito-Yokado: Mainly their online supermarket sales.

(*5) KITAMURA: EC related estimated sales including home delivery and in-store-pick-up sales.

(*6) MOA: Includes wholesale business.

(*7) MouseComputer: Includes store sales etc.

(*8) Belluna: Sum of both general and specialised mail-order business.

(*9) Oisix La Daichi: Net sales of Oisix, the home delivery business.

(*10) au Commerce & Life, Inc.: Established on 1 April 2019 by the merger of KDDI Commerce Forward Corporation and LUXA, Inc. Figures are estimated sales of the former LUXA for the year ended 31 March 2019.

(*11) Sales calculated from the ratio of orders received.

(*12) Estimation

The source: Koubunsuppan Corporation <netshop.impress.co.jp/node/6908>

Table 5.1-10 Number of Vending Machines and Annual sales in Japan (2018)

| Type | Product examples | Sales (JPYk) | | Active units | | Growth (%) |
|--|---|----------------------|------------------|------------------|------------------|----------------|
| | | 2016 | 2017 | 2018 | 2019 | |
| Beverages | Soft drinks | 1,740,528,000 | 2,130,000 | 2,120,000 | 2,100,000 | (0.94) |
| | Milk drinks | 120,620,000 | 133,500 | 126,900 | 111,600 | (12.06) |
| | Coffee, cocoa (Cup) | 137,904,000 | 156,400 | 154,000 | 141,400 | (8.18) |
| | Alcoholic drinks | 30,750,000 | 23,900 | 22,900 | 22,400 | (2.18) |
| Total (Beverages) | | 2,029,802,000 | 2,443,800 | 2,423,800 | 2,375,400 | (2.00) |
| Foods | Instant noodles, frozen foods, ice creams, confectioneries, etc. | 54,132,000 | 71,900 | 72,000 | 71,900 | (0.14) |
| Cigarettes | Cigarettes | 209,356,000 | 171,300 | 153,300 | 131,000 | (14.55) |
| Thickets | Passenger tickets | 1,415,842,000 | 14,700 | 15,200 | 15,000 | (1.32) |
| | Meals, admissions, etc. | 410,972,800 | 40,500 | 43,200 | 45,400 | 5.09 |
| Total (Tickets) | | 1,826,814,800 | 55,200 | 58,400 | 60,400 | 3.42 |
| Household items | Prepaid cards, sanitary goods, newspapers, toys, etc. | 417,967,500 | 238,600 | 230,300 | 210,100 | (8.77) |
| | Others (Newspapers, sanitary goods, toys, etc.) | 52,762,400 | - | - | - | - |
| Total (Household items) | | 470,729,900 | 238,600 | 230,300 | 210,100 | (8.77) |
| Total (Vending machines) | | 4,590,834,700 | 2,980,800 | 2,937,800 | 2,848,800 | (3.03) |
| Automated self-service machines | Money changer | - | 64,600 | 66,900 | 66,800 | (0.15) |
| | Automatic fare adjustment machine (Parking, hotels, hospitals, etc.) | - | 156,000 | 157,400 | 162,500 | 3.24 |
| | Others (Automatic lockers, lending machines, etc.) | 145,200,000 | 1,070,000 | 1,073,000 | 1,071,000 | (0.19) |
| Total (Automated self-service machines) | | 145,200,000 | 1,290,600 | 1,297,300 | 1,300,300 | 0.23 |
| Grand Total | | 4,736,034,700 | 4,271,400 | 4,235,100 | 4,149,100 | (2.03) |



Changes in 2017 data:

- Sales data are deleted as calculation became difficult due to diversification of Household item prices and payment means.
- Unified 'Household items' data excluding public phone prepaid cards.
- Automatic fare adjustment machine for Hospitals and others are merged.
- Growth rates could not be calculated due to changes in both data items and the acquisition methods, etc.

The source: Japan Vending Machine Manufacturers Association <www.jvma.or.jp/information/information_3.html>

GS1 Japan

9F, Shin Aoyama Bldg., East, 1-1-1, Minami Aoyama, Minato-ku, Tokyo

107-0062, JAPAN

T +81-(0)3-5414-8502

F +81-(0)3-5414-8504

www.gs1jp.org

| | |
|-----------------------------------|-------------------|
| President | MUKAE Yoichi |
| CEO and Senior Executive Director | SOMAYA Haruhisa |
| Director | NISHIYAMA Tomoaki |
| Director | MORI Naoko |
| Executive Adviser | HAMANO Michio |



GS1 Japan

9F, Shin Aoyama Bldg., East, 1-1-1, Minami Aoyama, Minato-ku, Tokyo
107-0062 JAPAN

T +81-(0)3-5414-8502

F +81-(0)3-5414-8504

www.gs1jp.org