

Oliot 오픈소스 프로젝트 “데이터 혁명, 참치에서 기차까지 그들의 일생을 담아라”

김 대 영

2019년 10월 17일

Standardsville

교수, 전산학부, KAIST

Director, Auto-ID Labs, KAIST





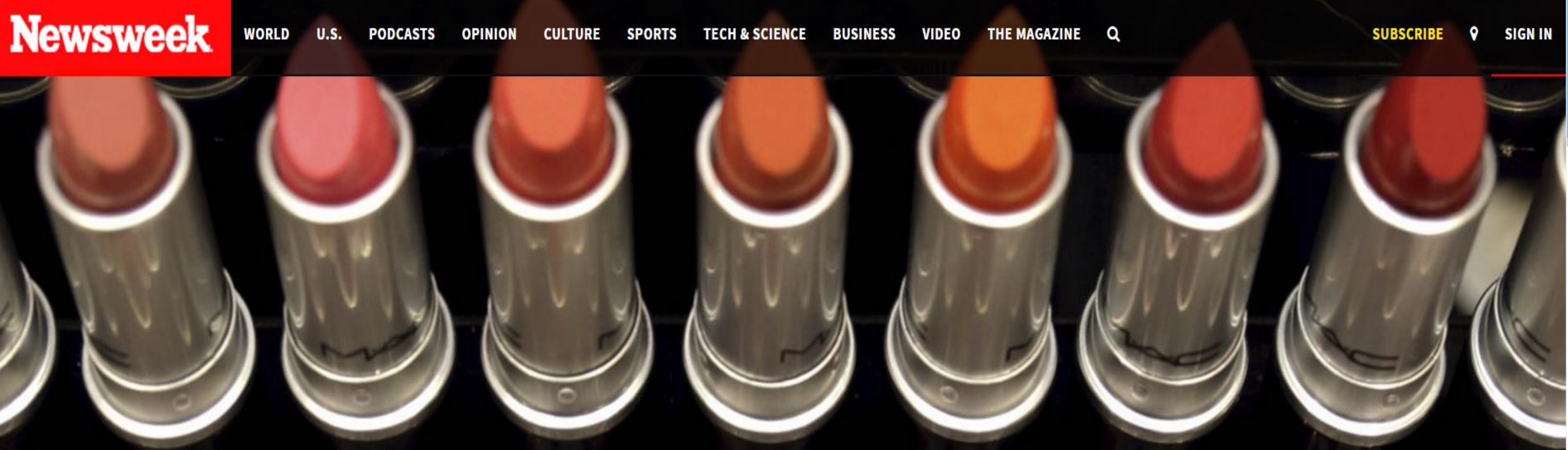
4IR

FOURTH INDUSTRIAL REVOLUTION



데이터 혁명 (Data Revolution)

Identify, Capture, Share, Use
식별하고, 기록하고, 공유하고, 활용한다



1999년 Kevin Ashton, Auto-ID Center (Labs)
MIT, 이 세계 최초로 Internet of Things
(사물인터넷) 용어와 기술 소개

IN THE MAGAZINE 

Auto-ID Labs는 GS1 국제표준기구의
선행표준기술연구 협력 국제 공동연구소 컨소시엄
(MIT, Cambridge, ETH Zurich, Keio, Fudan, KAIST)

Meet Kevin Ashton, Father of the Internet of Things



WE ARE IN THE DATA ERA

Jack Ma
CEO Alibaba



Keynote Speech

 Jack Ma

Founder & Executive Chair
of Alibaba Group

"20년간 지속돼온 IT(Information Technology)의 시대가 저물고 앞으로 30년간 DT(Data Technology) 혁명에 기반한 새로운 인터넷 시장이 열릴 것이다"

마윈(馬雲) 알리바바그룹 회장 Asian Leadership Conference 기조연설 (2015)

**Digital
Technology Era**

Digital Twin

#digitaltransformation

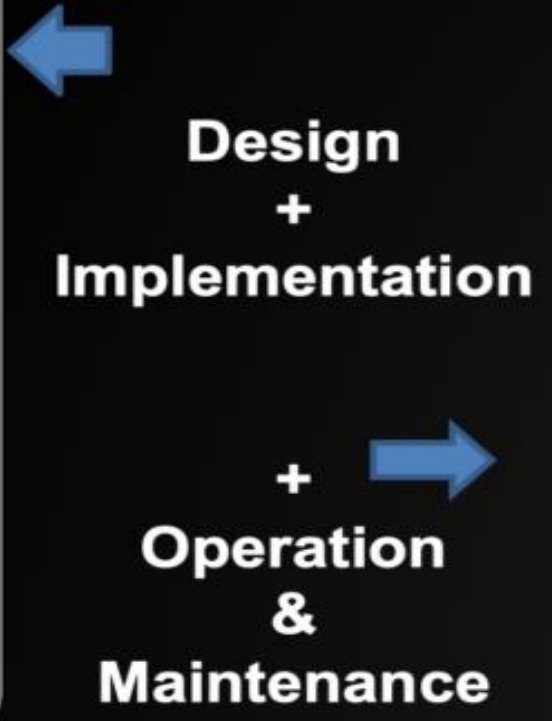
디지털혁명시대에는 **옛 것은 갈아엎고 가야 하는가?**
아님 함께 가야하는가? -> 국제표준 기반 다함께 하는 데이터 혁명



A digital twin is a digital or virtual copy of physical assets or products.

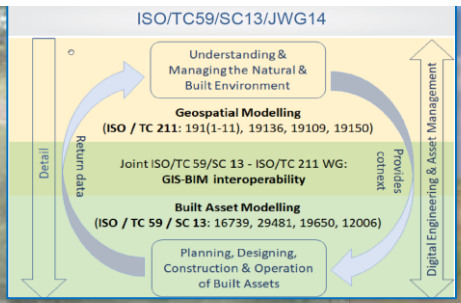


BIM Model



GIS Environment

Interoperability between GIS (Geospatial) and BIM



→ 항공기, 자동차 (사물)가 만들어내는 데이터 확대 (4차 산업혁명/데이터혁명)

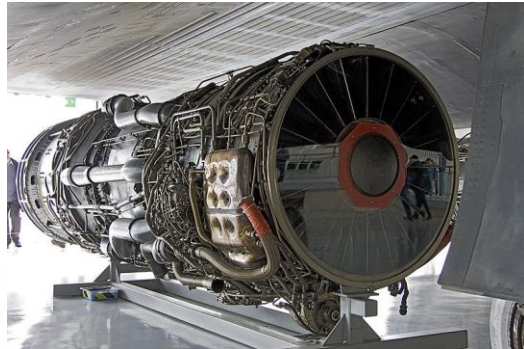


Forbes / Business

ForbesBrandVoice™ Connecting marketers to the Forbes audience. [What is this?](#)

JUN 23, 2014 @ 10:34 AM 7,428 VIEWS

Will The Internet Of Things Revolutionize The Aircraft Industry?



Sensor data from a cross-country flight

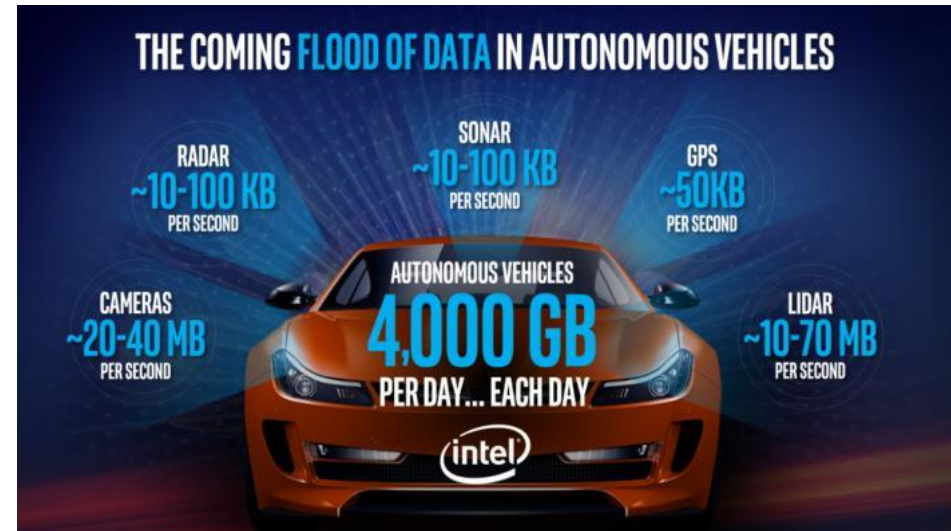


<http://www.forbes.com/sites/ptc/2014/06/23/will-the-internet-of-things-revolutionize-the-aircraft-industry/> http://wikibon.org/wiki/v/Big_Data_in_the_Aviation_Industry

OPINION

Just one autonomous car will use 4,000 GB of data/day

Self-driving cars will soon create significantly more data than people—3 billion people's worth of data, according to Intel



<http://www.networkworld.com/article/3147892/internet/one-autonomous-car-will-use-4000-gb-of-dataday.html>

2020년 전세계 데이터의 42퍼센트는 사물이 만들어낼 것으로 예상



SEAFOOD BUSINESS FOR OCEAN STEWARDSHIP



GLOBAL DIALOGUE on Seafood Traceability



→ Global Dialogue 씨푸드/해양생물 이력추적 시스템 프로젝트

Global Food Traceability Center, IFT (Institute of Food Technologies)



178 Degrees — Ahold Delhaize — Albion Farms and Fisheries — ALDI North Group — AP2HI — Bomar (PT. BOGATAMA MARINUSA) — Bumble Bee — Charoen Pokphand Foods Public Company Limited (CPF) — China Aquatic Products Processing & Marketing Alliance (CAPPMA) — Citra Mina — Fishin Company — General Tuna Corporation (Century Pacific Tuna) — Japanese Consumers' Co-operative Union — LIDL Stiftung & Co, KG — Luen Thai Fishing Venture — Metro — Nissui — Orca Bay — PT Bumi Menara Internusa (BMI) — Sainsbury's Supermarkets Ltd — Santa Monica Seafood — Sea Delight — Seacore — Southeast Asian Packaging and Canning Ltd — Stavis Seafoods — Taylor Shellfish — Thai Tuna Industry Association — Thai Union — Tri Marine — Vietnam Association of Seafood Exporters and Producers — Vinatuna

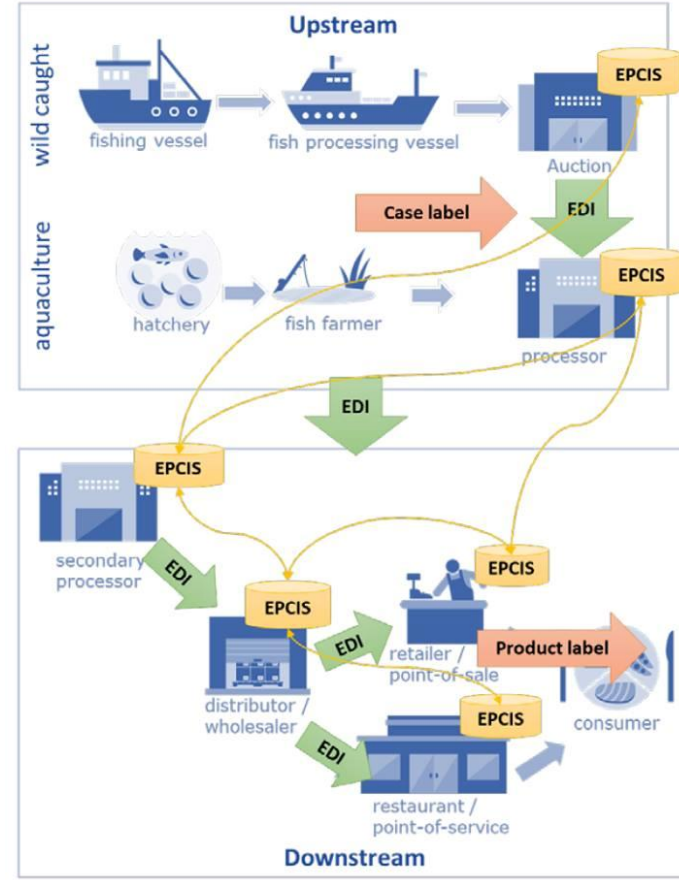
Endorsement of SeaBOS companies:
 Maruha Nichiro Corporation, Nippon Suisan Kaisha, Thai Union Group, Marine Harvest Group, Dongwon Industries, Cermaq (subsidiary of Mitsubishi Corporation), Cargill Aqua Nutrition, Skretting (subsidiary of Nutreco), Charoen Pokphand Foods, and Kyokuyo

(list above includes only GDST members who have granted permission to publicize their involvement in the Dialogue)



- 55 leading companies from Asia, Americas, & Europe
 - Includes large multinationals & SMEs from across the supply chain
 - Producing global voluntary standards for full-chain seafood traceability
- Defining what kind of data should be shared, and how to share it across proprietary systems

Figure 4-2 Sharing traceability data





Global Dialogue Trackathon (국제 해커톤)



DEVPOST

Hackathons

Projects

For organizations



GLOBAL DIALOGUE on Seafood Traceability

GDST Cologne Trackathon, 21-22 October 2019

The Global Dialogue is hosting its second Seafood Trackathon of 2019!

Bali Trackathon, 26-27 October 2019

Global Dialogue on Seafood Traceability (GDST) is hosting its second Seafood Trackathon of 2019!

- Auto-ID Labs, KAIST is kindly supporting the hackathon with access and use of its OLIOT EPCIS engine.



"With the data Global Fishing Watch provides, governments, fishery management organizations, researchers and the fishing industry can work together to rebuild fisheries and protect critical marine habitats."

- Leonardo DiCaprio

The Leonardo DiCaprio Foundation is proud to be a Funding Partner of Global Fishing Watch.



Partners



Sponsors



<https://traceability-dialogue.org/gdst-news-2/gdst-seafood-traceability-hackathon-2/?fbclid=IwAR3hE9UOjX1PRictBwY-LtsNk8W-Pdp-lrvWZKy5id75aouk9rBXtjt3loE>

© Auto-ID Lab Korea / KAIST





Celebrating 45 Years

Happy Birthday, Barcode!

Celebrating the Barcode's Debut | 1974-2019

→ GS1 비영리 국제표준기구 (데이터, 비즈니스, 산업, 사물인터넷)



114개국 국가-MO (Member Organizations), 170개 국가 공식 활용
2백만 이상의 기업 멤버로 구성된 비영리 국제표준기구

한국은 **대한상공회의소** 산하의 **GS1 Korea (유통물류진흥원)** 와
Auto-ID Labs, KAIST GS1 국제표준공동연구소 운영
(KAIST, MIT, Cambridge, ETH Zurich, Keio, Fudan University)

GS1

8 801234 543125

KAIST

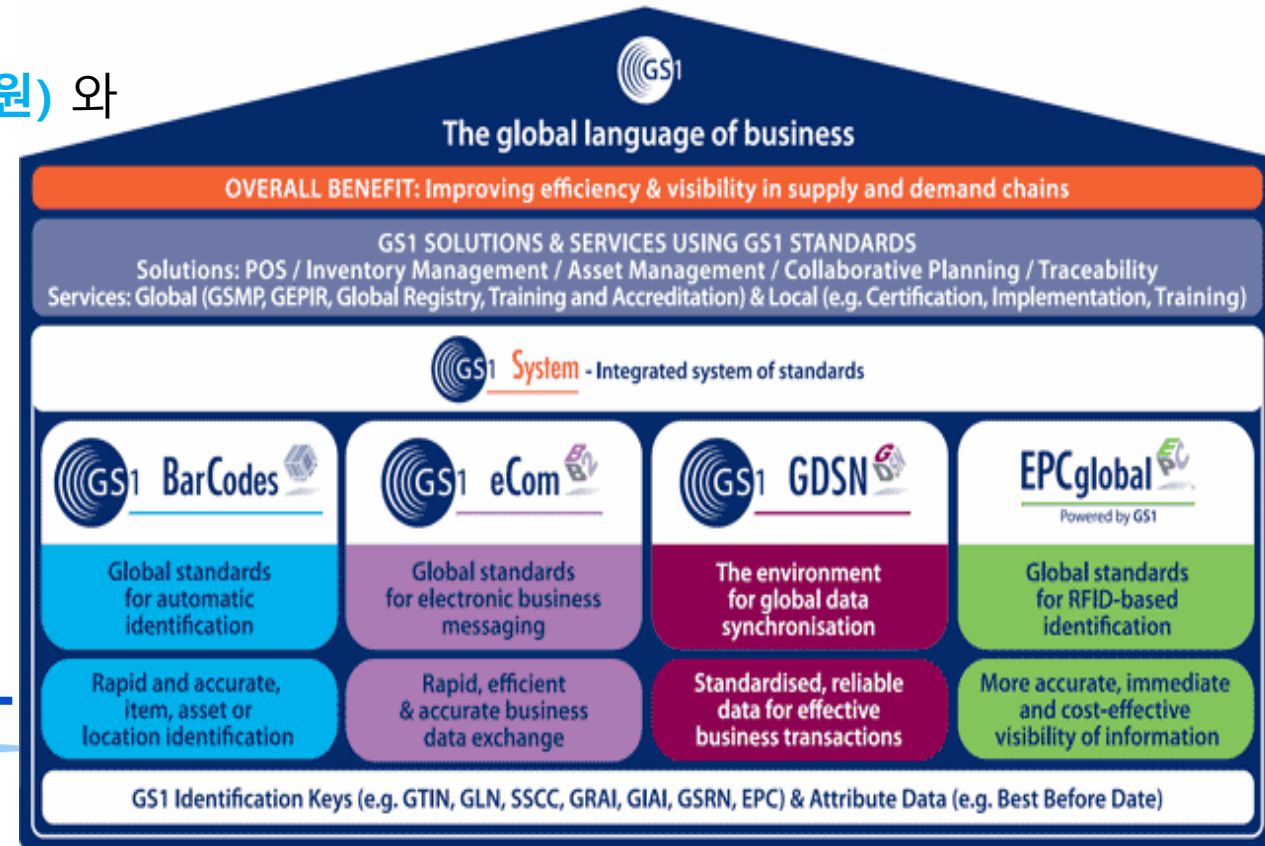
GS1 Korea

대한상공회의소 유통물류진흥원

대한상공회의소

AUTO-ID LABS

- Countries with a GS1 Member Organisation
- Countries served on a direct basis from GS1 Global Office



**Auto-ID Labs가
1999년 세계 최초로
사물인터넷 소개**

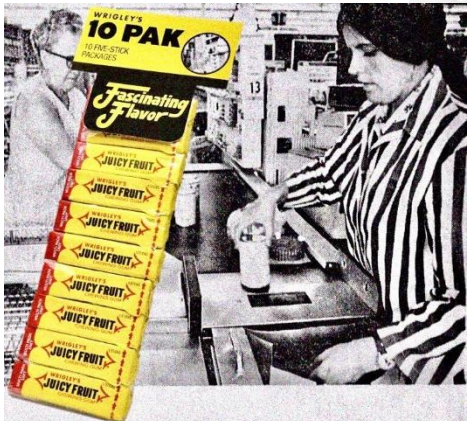


GS1 올드 타운 (1974 - 1999)

EAN-UCC

means

European Article
Numbering-Uniform Code Council



Scanner Ready Groceries

As fast as cashier Susan can pass groceries across the glass panel which covers a laser beam scanner, the price is recorded in the computerized register. Because cashiers immediately bag the

groceries after scanning, the order is ready when the sales slip is presented. The "automated front end" system is being tested at the Marsh Supermarket in Troy, Ohio. (Star Photo)



NCR 255 scanning system for supermarkets extends computer's power to checkstand. First system installed in U.S. is in Marsh Super Market, Troy, Ohio. Checker passes purchased items over scanning window. Universal Product Code, which appears on package, is read by laser scanner linked to computer. The latter records items and flashes prices on display panel. In supermarket control room, NCR 726 minicomputer controls system and provides detailed operating information for store manager.

GS1 뉴 타운 (2000 - 현재)



Digital Transformation

GS1 ISO INDUSTRIES



GS1 코리아 타운 (1988 - 현재)

EAN
stands for
European Article Number



우리의 과거는? 현재는? 그리고 미래는?



SEOUL 1988



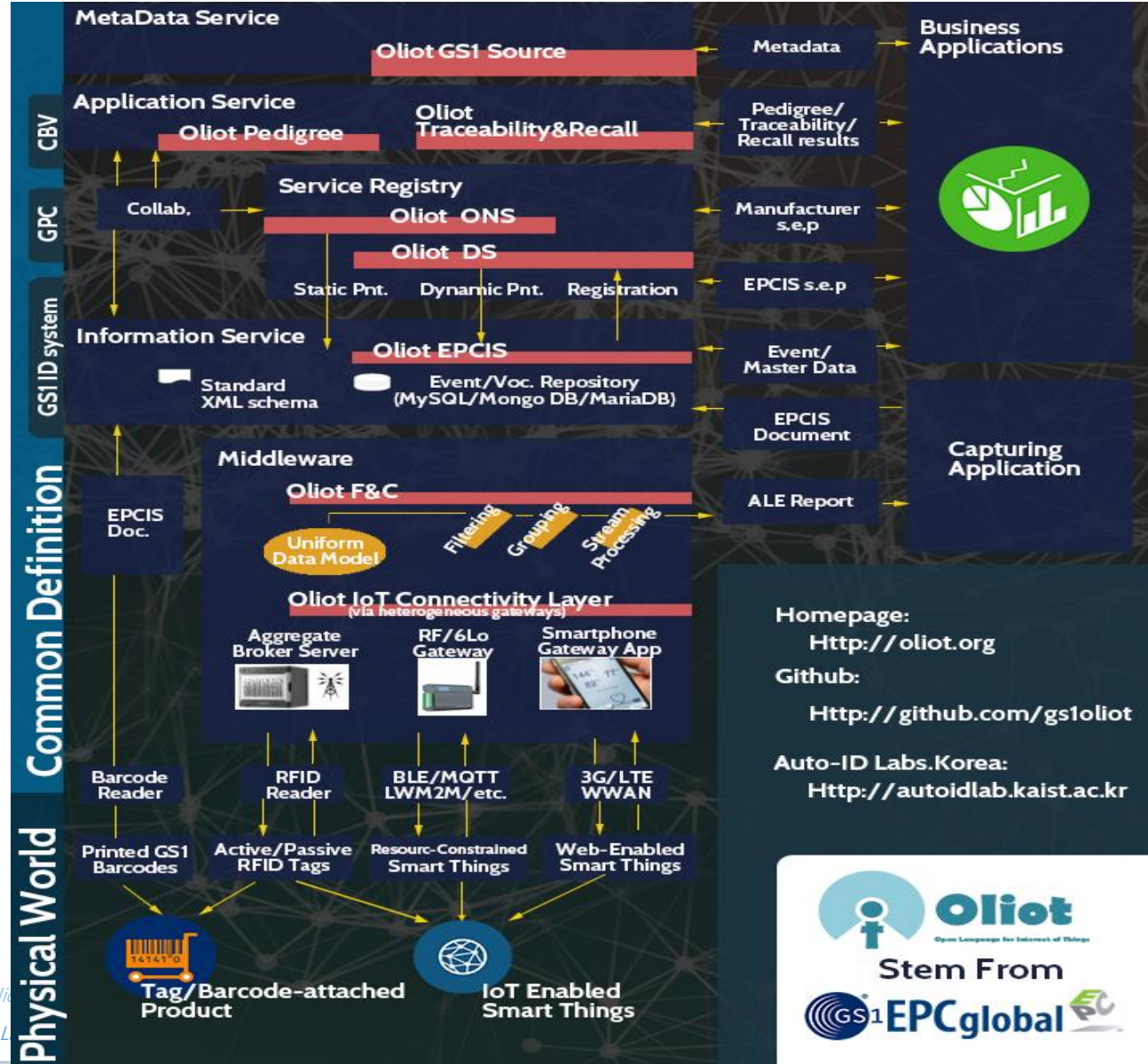
→ Oliot Open Source Project (KAIST) Apache License



• Oliot Open Source Project

GS1 EPCglobal 데이터 및 서비스 공유 국제표준 구현

- GS1 Source
- Pedigree
- Traceability & Recall
- ONS
- DS
- EPCIS
- F&C
- IoT connectivity Layer, etc.



Finnish [edit]

(index ol)

Etymology [edit]

olla (to exist) + *-io*

Noun [edit]

olio

1. creature, being, thing
2. (*philosophy*) object
3. (*programming*) object

© Auto-ID L



Homepage:
[Http:// oliot.org](http://oliot.org)
Github:
[Http:// github.com/gsoiliot](http://github.com/gsoiliot)
Auto-ID Labs.Korea:
[Http:// autoidlab.kaist.ac.kr](http://autoidlab.kaist.ac.kr)

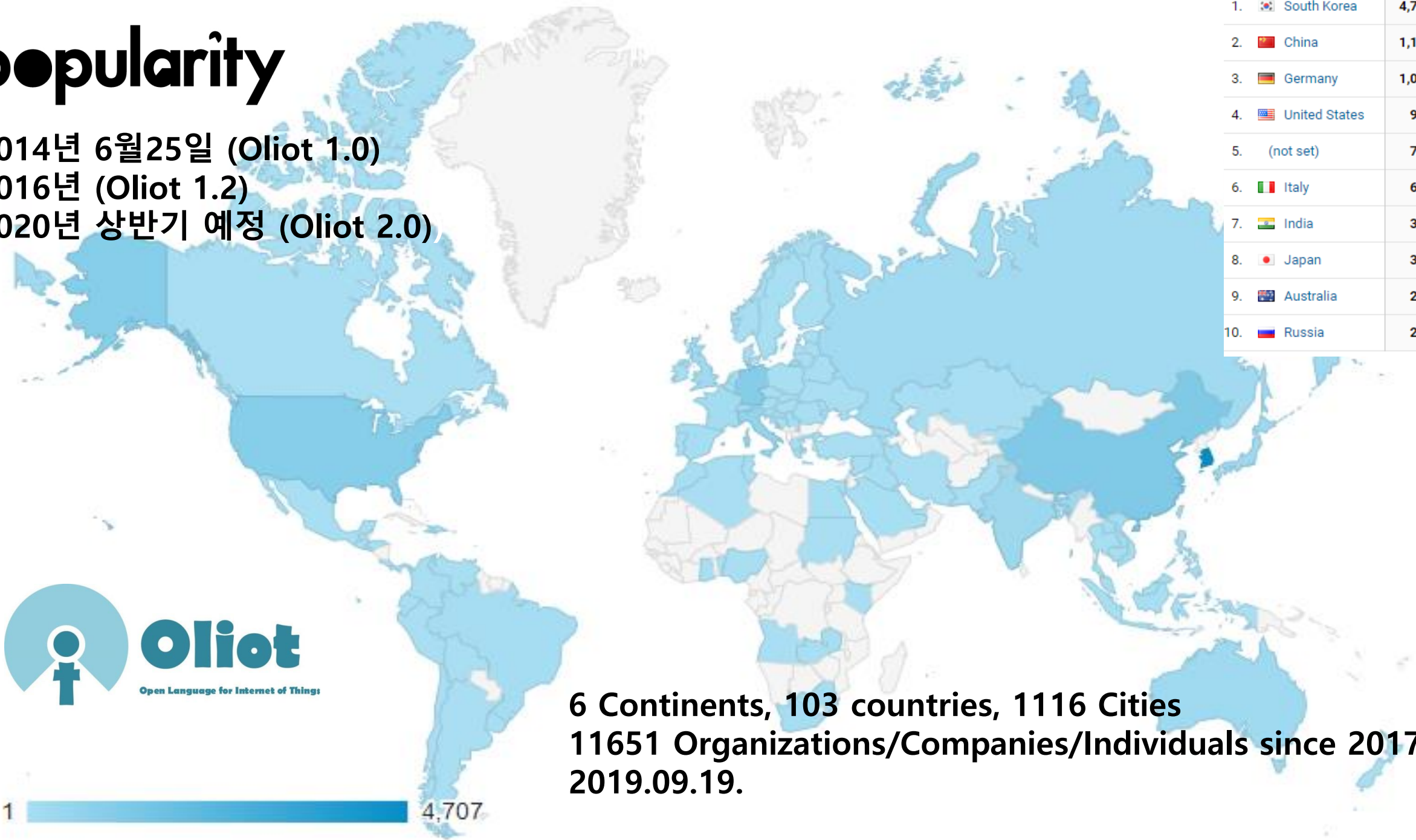


popularity

2014년 6월25일 (Oliot 1.0)

2016년 (Oliot 1.2)

2020년 상반기 예정 (Oliot 2.0)



1.	South Korea	4,707 (38.67%)
2.	China	1,193 (9.80%)
3.	Germany	1,014 (8.33%)
4.	United States	990 (8.13%)
5.	(not set)	708 (5.82%)
6.	Italy	639 (5.25%)
7.	India	376 (3.09%)
8.	Japan	302 (2.48%)
9.	Australia	295 (2.42%)
10.	Russia	268 (2.20%)



6 Continents, 103 countries, 1116 Cities
11651 Organizations/Companies/Individuals since 2017
2019.09.19.



→ Dataism – 호모 데우스 (Homo Deus)와 데이터 기반 사물인터넷 (GS1)



호모 데우스
미래의 역사

유발 하라리 | 감명주 옮김

전 세계 45개국! 500만 부 초대형 베스트셀러
《사피엔스》 유발 하라리 최신작!

《사피엔스》는 우리가 어디에서 왔는지 알려주고
《호모 데우스》는 우리가 어디로 가는지 알려준다

Yuval Noah Harari
Homo Deus

**RECORD,
UPLOAD, SHARE!**

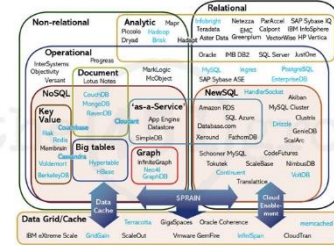
기록하고,
업로드 하
고, 공유
하라

IBM 인공지능 '왓슨', 한국어 배운다

372 3

IBM이 인공지능 왓슨을 이용해 한국어를 학습시키고 한국어 서비스를 2017년 초에 제공할 것이라고 5월 9일 밝혔다. 한국 IBM은 이를 위해 SK C&C와 전략적 제휴를 맺고, 왓슨과 관련된 마케팅 및 사스팀 구축(SI) 등의 사업을 공동 진행할 계획이다.

한국어는 왓슨이 배우는 17번째 언어다. 현재 왓슨은 영어뿐만 아니라 일본, 스페인어, 이탈리아어, 포르투갈어 등을 학습하고 음성인식, 번역, 음성-텍스트 변환, 문맥 분석 서비스 등을 제공하고 있다. 여기에 이차원인 IBM 리서치 기계 번역 모델 및 도구 부서 매니저는 "한국어는 컴퓨터가 배우기에 가장 어려운 언어"라며 "이제 한국어를 익힌 왓슨은 밥 개발에 활용되고, 한국인에게 서비스를 제공할 수 있을 것"이라고 흥미를 표현했다.



Internet 시대의 인공지능 : 영어, 한글, 중국어 배우기
Internet of Things 시대의 인공지능 : GS1 언어 배우기

- 사물인터넷 세상에서 발생하는 데이터를 “기록하고, 업로드하고, 공유하라”
- 국가, 언어, 기업, 산업을 통합할 수 있는 사물인터넷을 위한 새로운 국제표준 언어 요구

Slide 20

→ GS1 국제표준 기반 데이터 혁명



- 사물인터넷 (4차산업혁명) 세상에서 글로벌 데이터/서비스 공유 생태계



사물에 연계된 서비스 생성, 검색 및 접근 [언어, 국가 글로벌 지원]



표준화된 데이터 저장 및 검색, 공유 [사물인터넷 표준언어]



데이터와 서비스 실록 [세상에서 일어나는 모든 것을 기록]

국제표준 데이터 기반 4차산업혁명이 바꿀 미래 [사회와 산업]

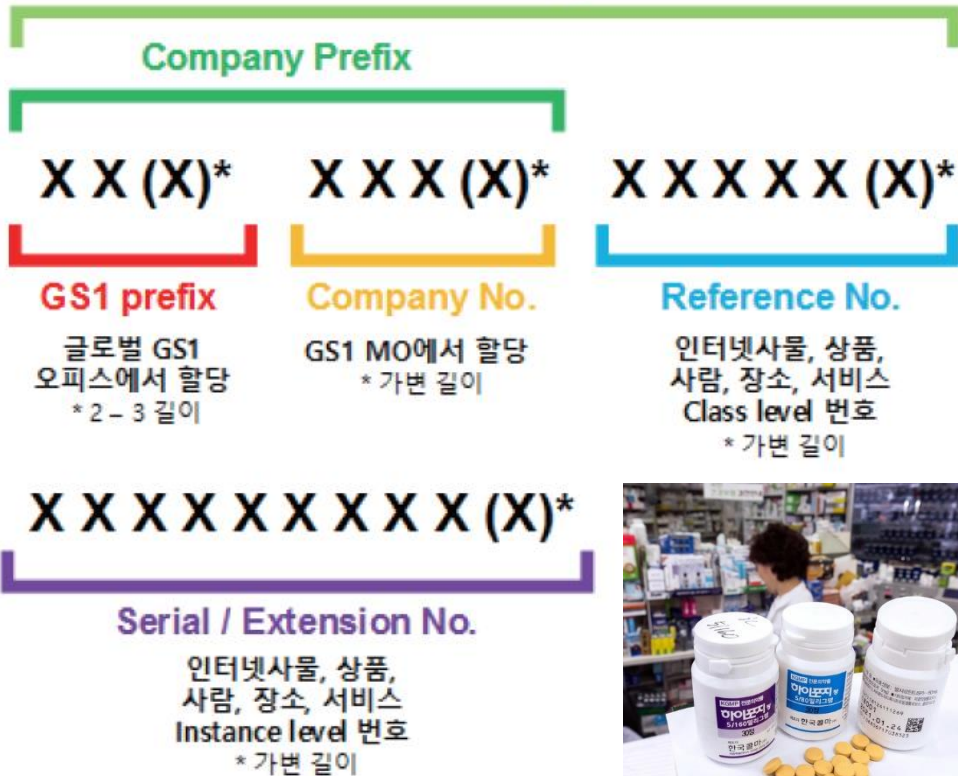


GS1 Company Prefix (식별자의 시작)



- GS1 국제 생태계에 진입하기 위해, 각 기업이나 기관은 국가코드와 기업/기관 코드로 이루어진 GS1 Company Prefix (GCP) 를 확보해야 함
- GS1 Company Prefix 를 기반으로 16종류이상의 다양한 글로벌 GS1 식별자를 사용할 수 있음 (GTIN, GRAI, GIAI, **GLN**, GSRN,)

GS1 ID key



Gepir Worldwide

Master Data GLN

9501101020016 No error

GLN:
GCP: 8712000
Heineken Nederland B.V.

KT ... 47% 오후 1:33

Gepir Worldwide

Master Data GLN

9501101020016 No error

GLN: 8809293080018
GCP: 880929308
WHARANG

Address:
701-80, Soksa-ri, Geumsan-my
GYEONGSANGNAM-DO

660922
Korea

유통표준코드 회원증

대한민국: 880
대전시: 968822

대한민국: 880
시흥시: 969104





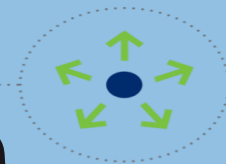
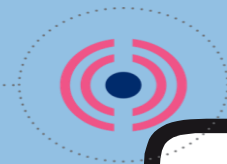
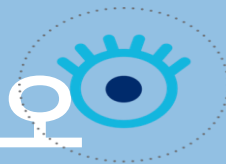
GS1 식별자 종류 및 적용 시나리오

IDENTIFY

CAPTURE

AUTO ID LABS

SHARE



Volkswagen Models (GTIN)



AVIS Rental Office (GLN)



AVIS Coupon (GCN)



Shipping (GSIN)



AVIS Rental Cars (GRAI)



AVIS Employees and Customers (GSRN)



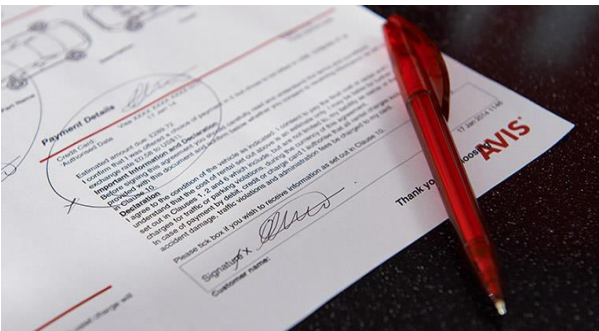
Automotive Components (CPID)



Consignment (GINC)



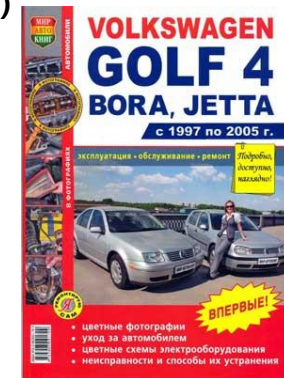
AVIS Shuttle Bus (GIAI)



AVIS Contract Documents (GDTI)

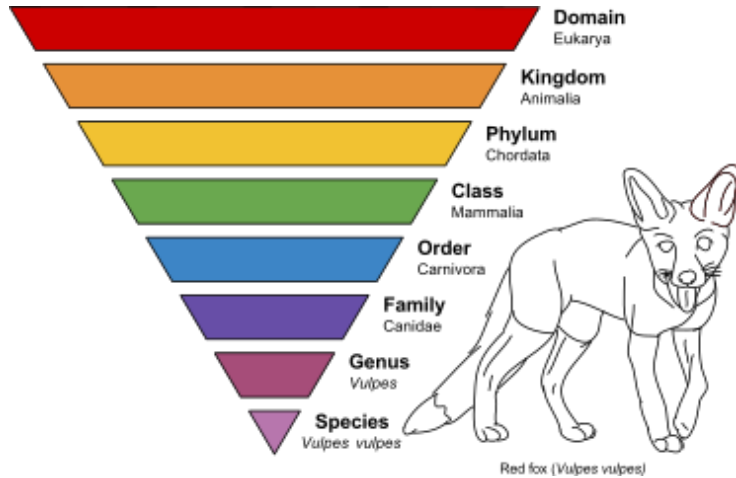


Pallet / Box (SSCC)



Manual Books (ISBN)

→ 상품(사물) 분류 코드 체계 Global Product Classification (GPC)



생물 분류 코드체계인 “종속과목강문계” 처럼, 전세계 제품(사물)은 “세그먼트, 패밀리, 클래스, 브릭”의 4가지 계층으로 분류하며, 더욱 상세한 내용은 어트리뷰트로 제공 (예. Source: 소, 양, 염소, 낙타등)

Segment

Food/Beverage/
Tobacco

Family

Milk/Butter/Cream/
Yogurts/Cheese/
Eggs/Substitutes

Class

Milk and Milk
Substitutes

Brick



Milk
(Perishable)

Brick Attributes

Brick Attribute Values

If Organic

NO
UNIDENTIFIED
YES

Level of
Fat Claim

FULL FAT
HALF FAT
LOW FAT
NON FAT
REDUCED FAT
UNCLASSIFIED
UNIDENTIFIED

If With
Probiotic
Claim

NO
UNIDENTIFIED
YES

Source

BUFFALO
CAMEL
ALMOND NUTS
COMBINATION
COW
.....
SHEEP
UNCLASSIFIED
UNIDENTIFIED
YACK

- ⊕ Segment: 70000000 - Arts/Crafts/Needlework
- ⊕ Segment: 68000000 - Audio Visual/Photography
- ⊖ Segment: 77000000 - Automotive
 - ⊕ Family: 77010000 - Automotive Accessories and Maintenance
 - ⊕ Family: 77030000 - Cars and Motorcycles
- ⊕ Segment: 53000000 - Beauty/Personal Care/Hygiene
- ⊕ Segment: 83000000 - Building Products
- ⊕ Segment: 74000000 - Camping
- ⊕ Segment: 47000000 - Cleaning/Hygiene Products
- ⊕ Segment: 67000000 - Clothing
- ⊕ Segment: 66000000 - Communications
- ⊕ Segment: 65000000 - Computing
- ⊕ Segment: 94000000 - Crops
- ⊕ Segment: 58000000 - Cross Segment
- ⊕ Segment: 78000000 - Electrical Supplies
- ⊕ Segment: 50000000 - Food/Beverage/Tobacco

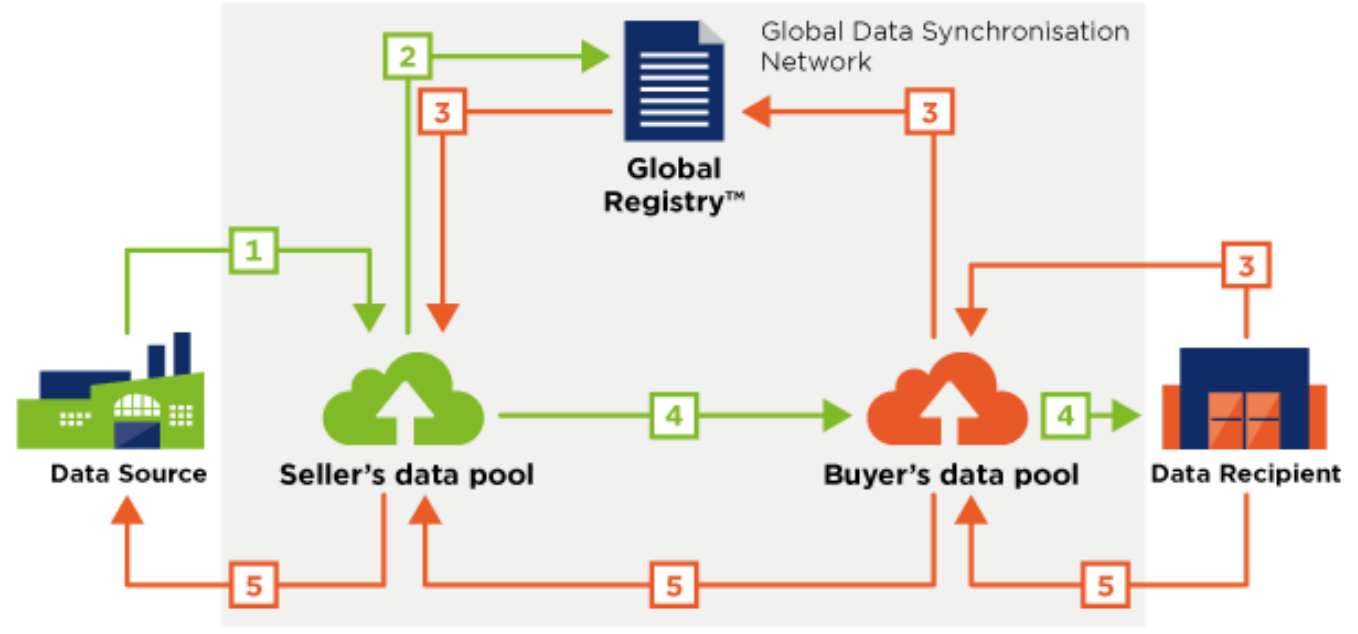
→ GS1 GDSN, Global Registry Attributes [마스터 데이터] B2B 상품 데이터 (+GS1 Source, GS1 Cloud)

Foodservice GS1 US GDSN Attribute Guide

Release 1.1 - APR 02 2016



- 표준화된 상품 데이터를 글로벌 하게 공유하기 위한 표준과 분산 데이터풀 (데이터베이스) 시스템
- 2017년 1월 13일 현재 전세계 31개 Data Pool 운영 (1WorldSync가 40% 이상의 점유율)



1. Loading of company data
2. Registering of company data
3. Subscription to seller's data pool
4. Publishing of company data
5. Confirmation of receipt of company

• B2C의 상세 상품 데이터를 제공하기 위한 노력이 **GDSN**, **GS1 Source**, **GS1 Cloud** 를 통해 상호 보완 및 경쟁적으로 진행되고 있음. (예. 식품의 성분, 인증, 알러지 정보등)

2	Foodservice GS1 US Standards Initiative GDSN Attributes	14
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→ 파편화된 사물인터넷 세계/플랫폼/서비스 (사일로)



(Source: Alliance for IoT Innovation –www.aioti.org)

→ 최상위의 사물인터넷 인프라 표준 요구

- 데이터/서비스 공유 -



오픈 데이터 오픈 프로세스 오픈 서비스 오픈 공유



사일로



사일로



사물의 연결
사물 매쉬업
서비스



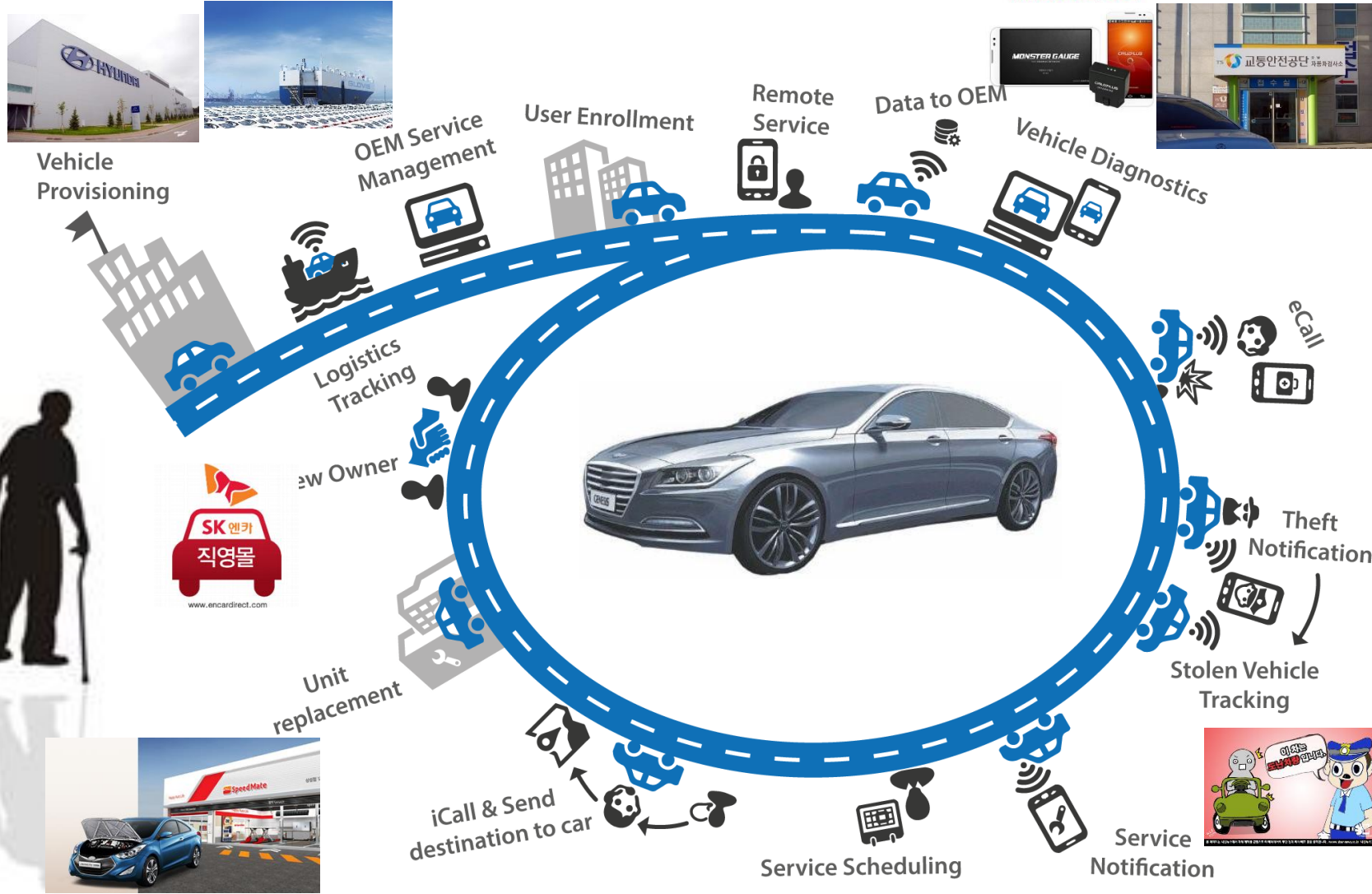
OPEN CONNECTIVITY
FOUNDATION
© Auto-ID Lab Korea / KAIST



→ 사물의 생애 표준 데이터 Record, Upload, Share

자동차(사물)의 표준화된 전생애 관리가 필요

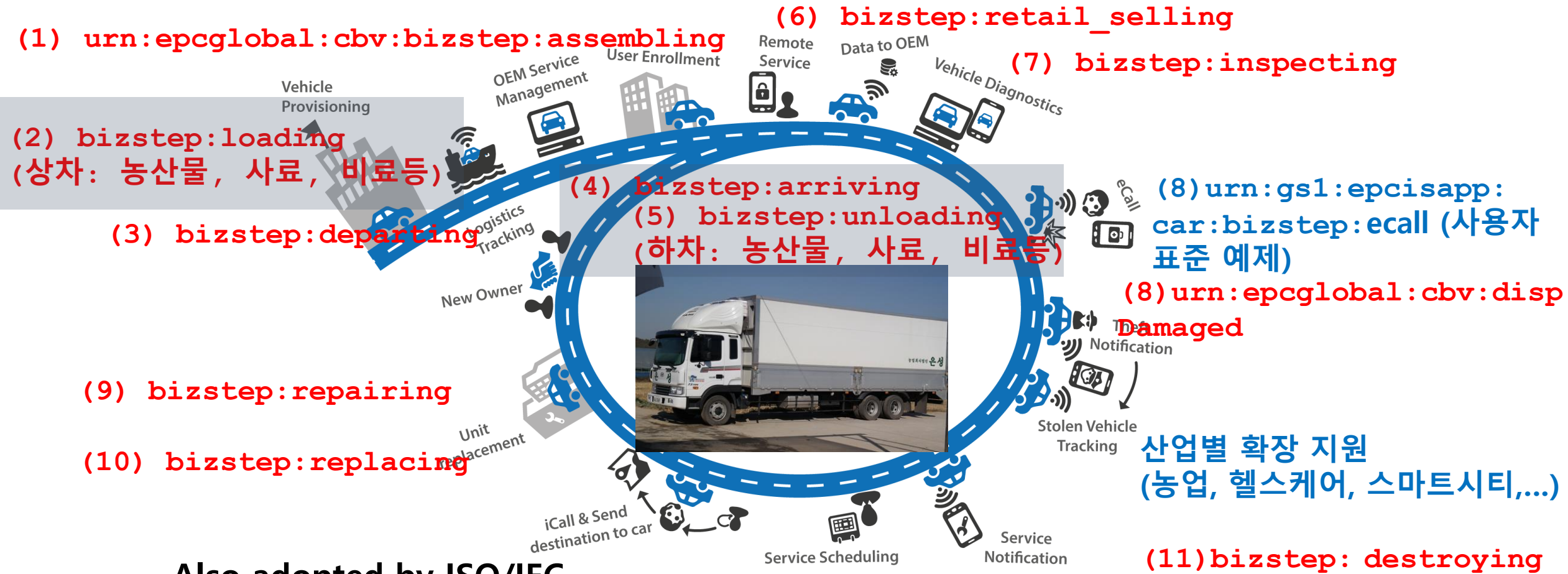
- 앞으로 시스템 개발은 개별 서비스 중심이 아니라, 사물 자체가 가진 근원적 데이터를 활용하는게 복잡성을 줄여줌
- 전생애 이벤트를 표현하기 위한 국제표준 어휘 필요



→ 비즈니스 프로세스 (마스터, 트랜잭션, 이벤트 데이터)를 기술하는 표준 어휘 Common Business Vocabulary (CBV)



- 사물인터넷 이벤트 데이터의 상황을 표기 하기 위한 표준화된 어휘 (**Common, Standard/User Vocabulary**)
 - Identifier 의 Syntax 와 Vocabulary Element 표준화
 - 전산업에 공용인 CBV와 산업별, 국가별, 기업별로 새로운 Standard/User Vocabulary 표준화 가능



Also adopted by ISO/IEC
ISO/IEC 19987:2015 standard

→ EPC Information Service (EPCIS)
트랜잭션 데이터와 이벤트 데이터 공유 (+EDI)



WHAT
Individual Object Instances
(e.g. Bus:GIAI..)

WHERE
Read Point, Business Location
(e.g. Station:SGLN)

WHEN
Time Stamp of the event
(date + time + timezone)

WHY
Business Step (e.g. Arriving)
Disposition (e.g. In Progress)

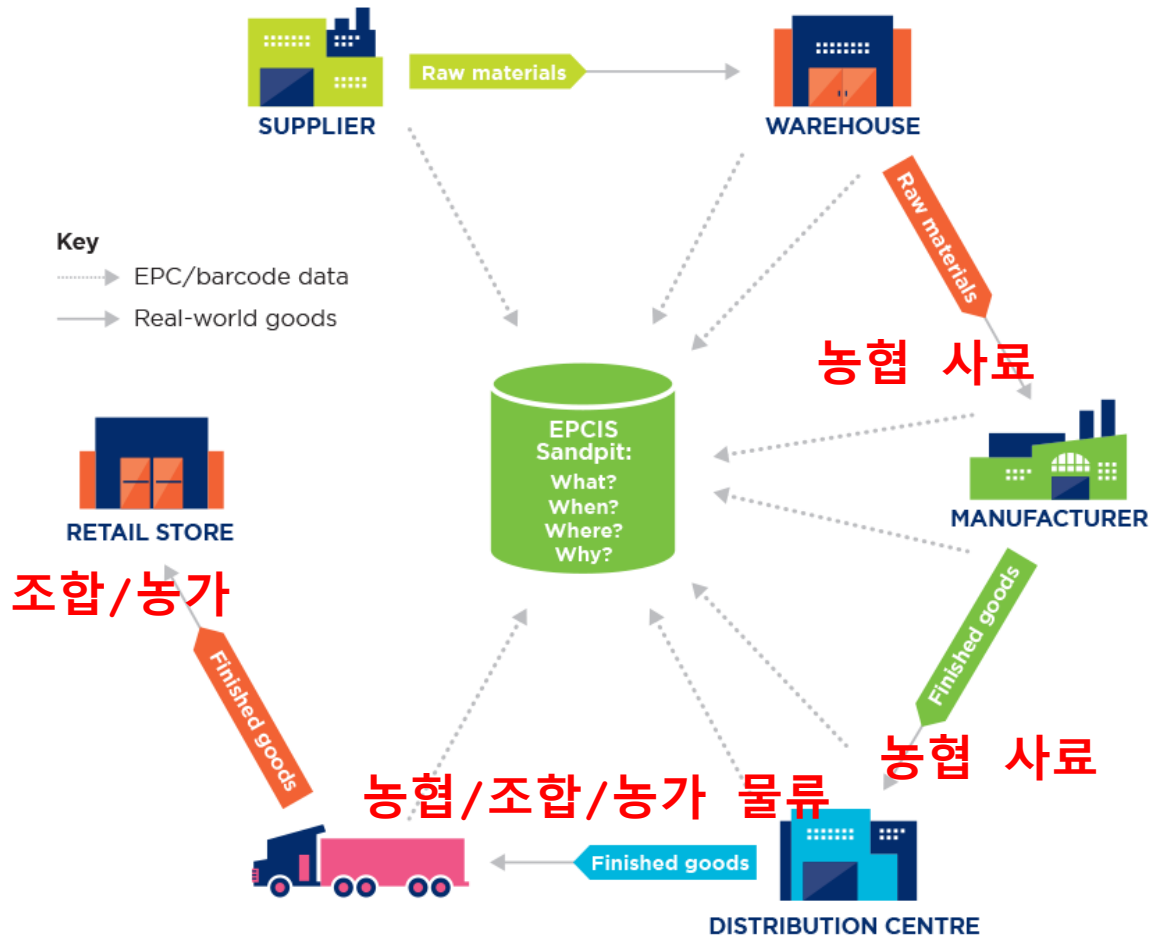
EPCIS EVENT 표준으로 기록되고 공유

→ EPC Information Service (EPCIS) 트랜잭션 데이터와 이벤트 데이터 공유 (+EDI)



미국 옥수수 원료 공급

평택항 사일로



• EPC Information Service (EPCIS)

- Current Version 1.2, Oct. 2016
- Also adopted by ISO/IEC
 ISO/IEC 19987:2015 standard

사물인터넷 이벤트를 저장하는 분산 연합 데이터 베이스 / 왼쪽 그림 처럼 EPCIS 가 중앙에 하나 있는 게 아니라, 부품제조기업, 창고, OEM, 물류, 리테일이 모두 다른 회사 라면, 제각기 운영하고, 가상으로는 단일의 데이터 저장소로 보임

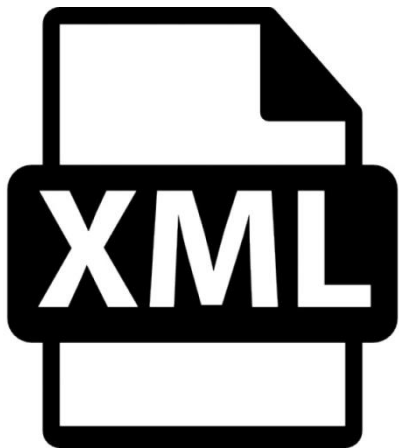


The Internet of Trains

Analysing sensor data helps Siemens keep operators on track by reducing train failures

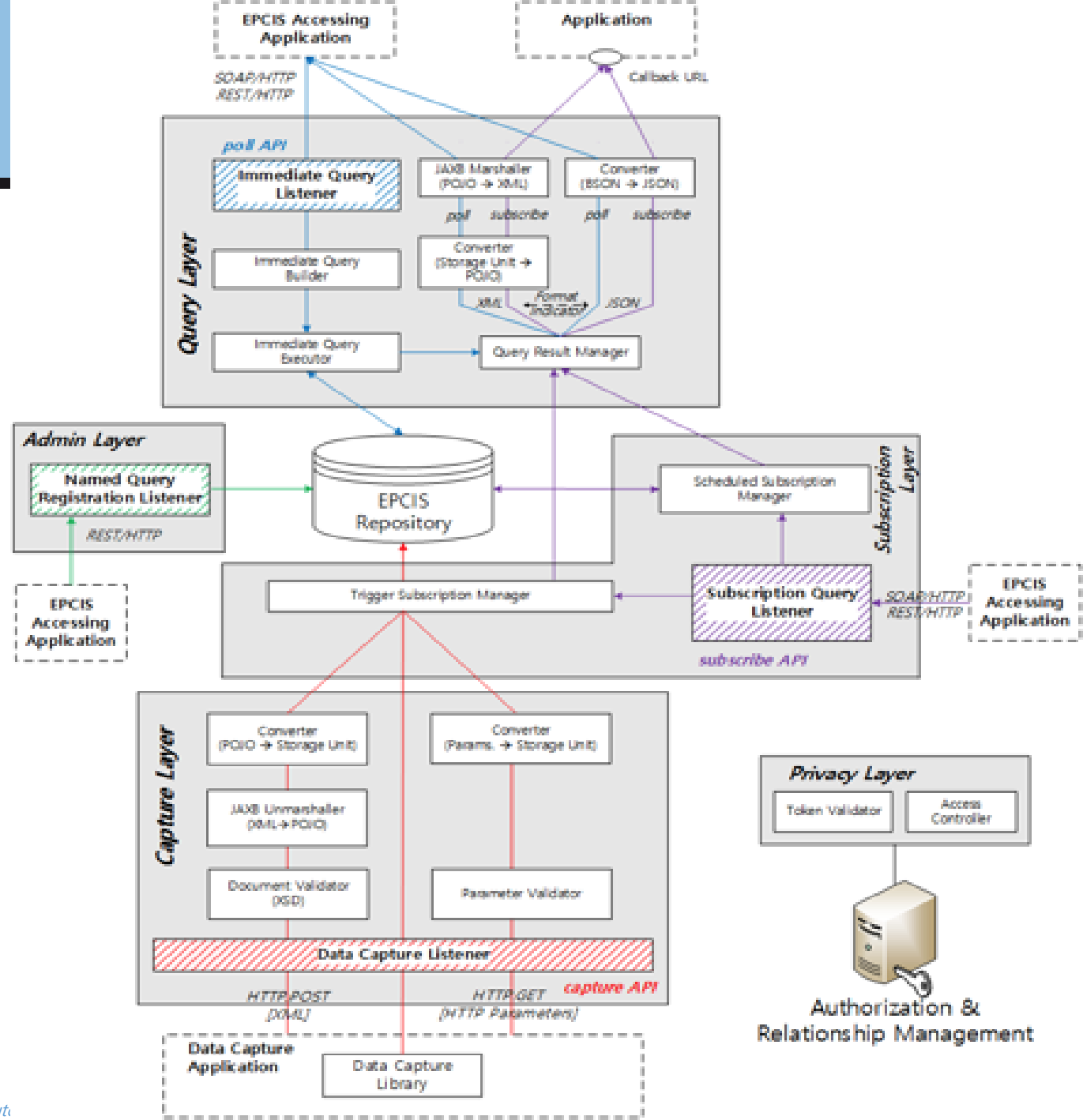
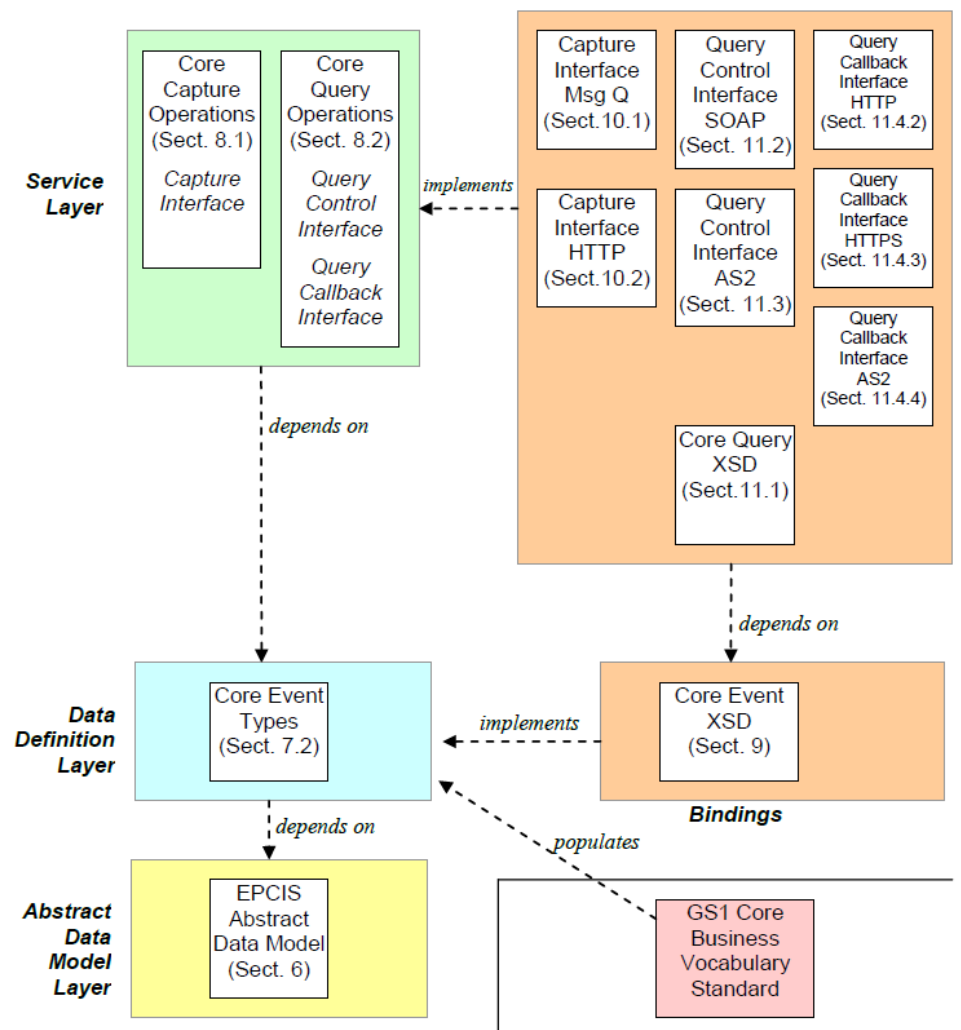


EPC Information Service Document 예.



EPCIS event	Event type	ObjectEvent	
	Action	OBSERVE	
WHEN	eventTime	2014-12-08T12:00:00.000+02:00	
WHAT	epcList	urn:epc:id:giai:735005385.9907412345676	
WHERE	readPoint	urn:epc:id:sgln:734005385.011.511	
	bizLocation	urn:epc:id:sgln:734005385.011.212	
WHY	bizStep	urn:epcglobal:cbv:bizstep:arriving	
	disposition	urn:epcglobal:cbv:disp:in_progress	
	bizTransactionList	urn:gs1:epcisapp:rail:btt:passage	http://transaction.examplerail.com/passage/xyz12345
	source	urn:epc:id:sgln:734005385.481.0	
	destination	urn:epc:id:sgln:734005385.011.0	
	<i>Rail extensions</i>	compassDirection	NE
		directionIndicator	1
		vehicleOrientation	1
		vehiclePosition	1
		vehicleAxleCount	4
	proxyGIAI	urn:epc:id:giai:735005385.1907412345676	

→ 예) OIot EPCIS 구현



→ GS1 Digital Link (QR 표준: 서비스 표준접근)



Digital Link



Short URL GS1 Digital Link

wrxfq.tn.gg



URL

<https://wrxfq.tn.gg/01/5000157089908>

Download

PNG / PDF / Custom

🔗 Setup redirection

👁️ Setup image recognition



→ ONS (Object Naming Service) GS1 사물인터넷 서비스 검색 표준



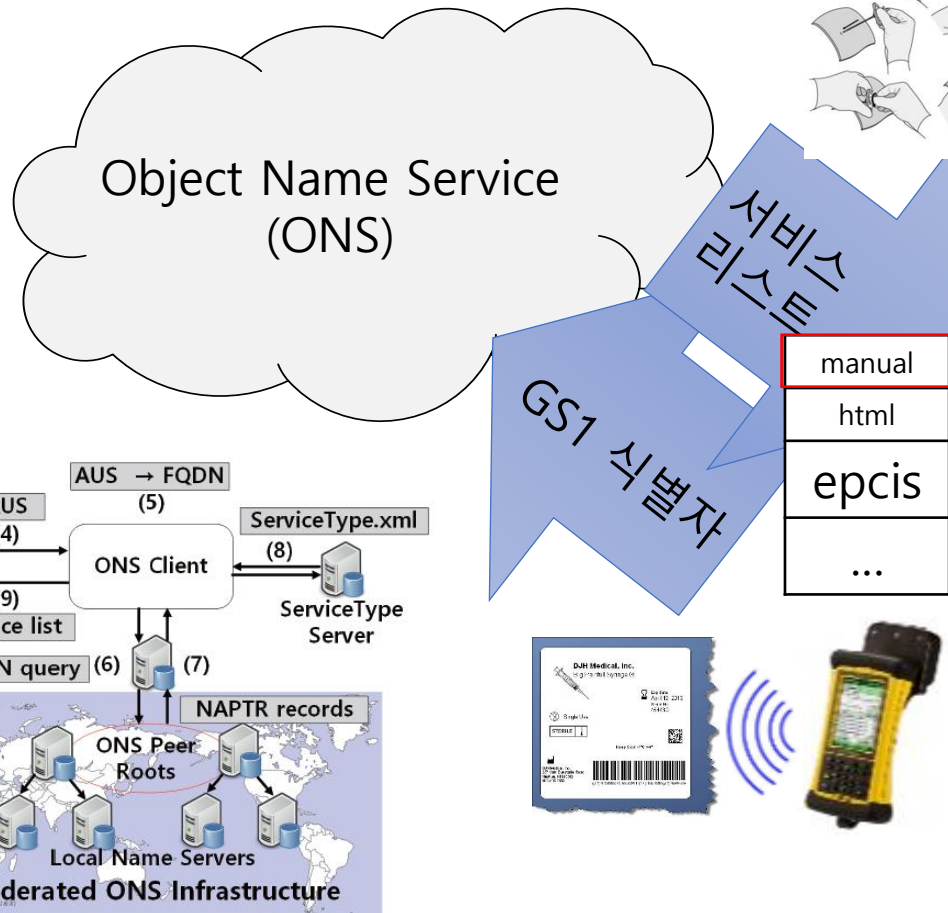
- ▶ 제품(사물)에 특화된 생산자, 3rd Party 제공 서비스 등록, 검색, 접근 서비스
 - ▶ 한국은 시험용으로 onsepc.kr root ONS 서버를 Auto-ID Labs, KAIST에서 운용중



자동차 원격진단



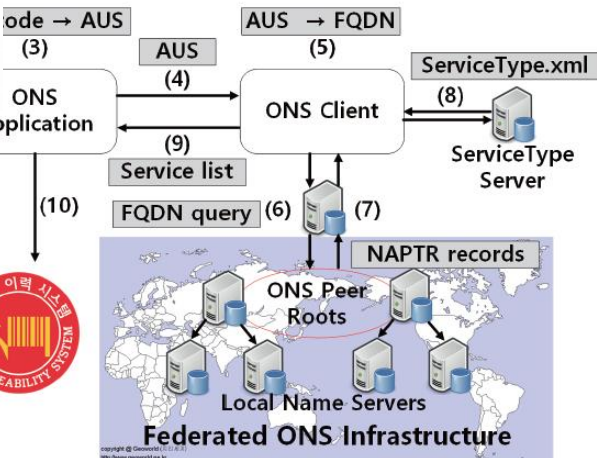
자동차 수리 예약 서비스



The Internet of Things - GS1 France & Afnic major contributors to the ONS 2.0
PRESS RELEASE February 18, 2013 -
 GS1 France and Afnic are continuing their cooperation in the Internet of Things, with a view to the global deployment of the ONS 2.0 standard.

ONS 2.0 Object Name Service

The ONS 2.0 standard, the result of a partnership initiated in 2008 between GS1 France and Afnic, is now available to users. The standard provides new opportunities for companies to connect their objects to the Internet. GS1 France and Afnic are continuing their cooperation in the Internet of Things, with a view to the global deployment of the ONS 2.0 standard.



GS1 식별자 표준을 통한 식별

GS1 데이터 공유망 (GDSN)에 상품정보 제공

GS1 이력 추적 서비스 이용

Fish & Fresh

생산자

상품정보

상품

유통자

운송수단

Order to cash

재고 관리

생산라인

리콜 관리

Point-of-Sale Scanning

GS1 이벤트 저장소 (EPCIS)에 농축수산물 이력에 관한 이벤트 수집

Synchronise and Share Product Data

GS1 웹 서비스를 이용한 검색

포획

가공

포장

수송

Search and Evaluate

새로운 상품 검색

Identify Locations

Delivery

Purchase

Use

구매 상품 검색

Fish & Fresh

→ 중국 알리바바와 미국 아마존의 유통물류 미국, 유럽, 중국의 식품 안전법 및 정보 공개, 이력 추적



Alibaba Group
阿里巴巴集团

Data Synchronization Quick Start Guide

na Standards



Alibaba GDSN joint project

20 May 2017

Learn more with this [data synchronisation quick start guide](#).

Are you ready for changes to food labelling?

Time is running out for compliance... but we're here to help.



Home | Headlines | Amazon mandate that sellers use GS1 barcodes

Amazon mandate that sellers use GS1 barcodes



Slide Auto-ID Lab

FDA U.S. Food and Drug Administration
Protecting and Promoting Your Health

Food

The New FDA Food Safety Modernization Act (FSMA)



→ 일본 편의점 2025년까지 RFID 도입 선언



뉴스 | **오피니언** | 프리미엄 | 연예 | 스포츠 | 증권 | 부동산 | 교육 | 비즈&

구독신청 | 로그인 | 회원가입



뉴스홀 | 전체기사 | 경제 | 기업 | 사회 | 국제 | 부동산 | 증권 | 정치 | IT과학 | 문화 | 기획연재 | Special Edition | 인기뉴스

속보 | 메이 英총리의 좌절...브렉시트 방식 재.

日 편의점 5개사, 2025년까지 전 점포 셀프계산대 도입

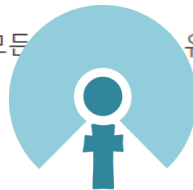
박대의 기자 | 입력 : 2017.04.18 16:28:21

일본 대형 편의점업체 5곳이 2025년까지 모든 점포에 고객이 스스로 결제할 수 있는 셀프 계산대를 설치한다.

심각해지는 인력부족 문제 해결과 더불어 유통 업계의 생산성 향상으로 이어질 것으로 기대되고 있다.

니혼게이자이신문은 18일 세븐일레븐, 패밀리마트 등 일본 5대 편의점업체가 2025년까지 매장 내 모든 제품에 무선인식(RFID) 전자태그를 부착해 셀프 계산대를 도입해 나갈 방침이라고 보도했다. 편의점 업체들은 일본 경제산업성과 공동으로 발표할 예정인 '편의점 전자태그 1000억 장 선언'에 이같은 내용을 명기하고 사업을 추진할 방침이다.

'1000억'은 5개 업체가 RFID 전자태그를 모든 제품에 부착하는 데 필요한 양을 유래했다.



Oliot

Open Language for Internet of Things



△일본의 편의점 브랜드 로손에 도입된 무인계산대.



일본 도쿄 이케부쿠로에 있는 의류업체 'GU'의 매장에선 무인 결제를 시행하고 있다. 고객들이 무인 결제대에서 결제하고 있는 모습. /사진= 연합뉴스

일본, 의류 판매에 무인시스템 도입...RFID 이용



의료 산업, 헬스케어



UDI

Supply Chain

Clinical Care

Post Market Surveillance



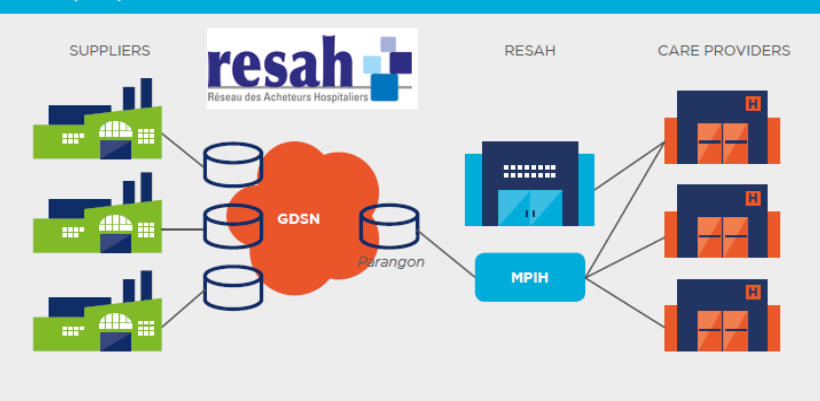
EPCIS allows trading partners to exchange data in concert with products as they move through the supply chain. The industry pilot between JJSC and ABC did just that, with actionable and repeatable results.

FDA/IMDRF

UDI (50만 종류

이상 의료기기) 미국 존슨앤존슨 제약생산정보 (EPCIS 표준 DB) 영국 (DoH, NHS)

Resah requested that all its suppliers send synchronised trade item data through the Global Data Synchronisation Network (GDSN).



프랑스 resah 유통물류 (GDSN 마스터 DB) 일본 (의료기기 살균, GIAI)

→ GS1 헬스케어 전략 2018-2022

Digital Thread (제약 및 의료기기 이력추적)



GS1 enables healthcare's digital thread

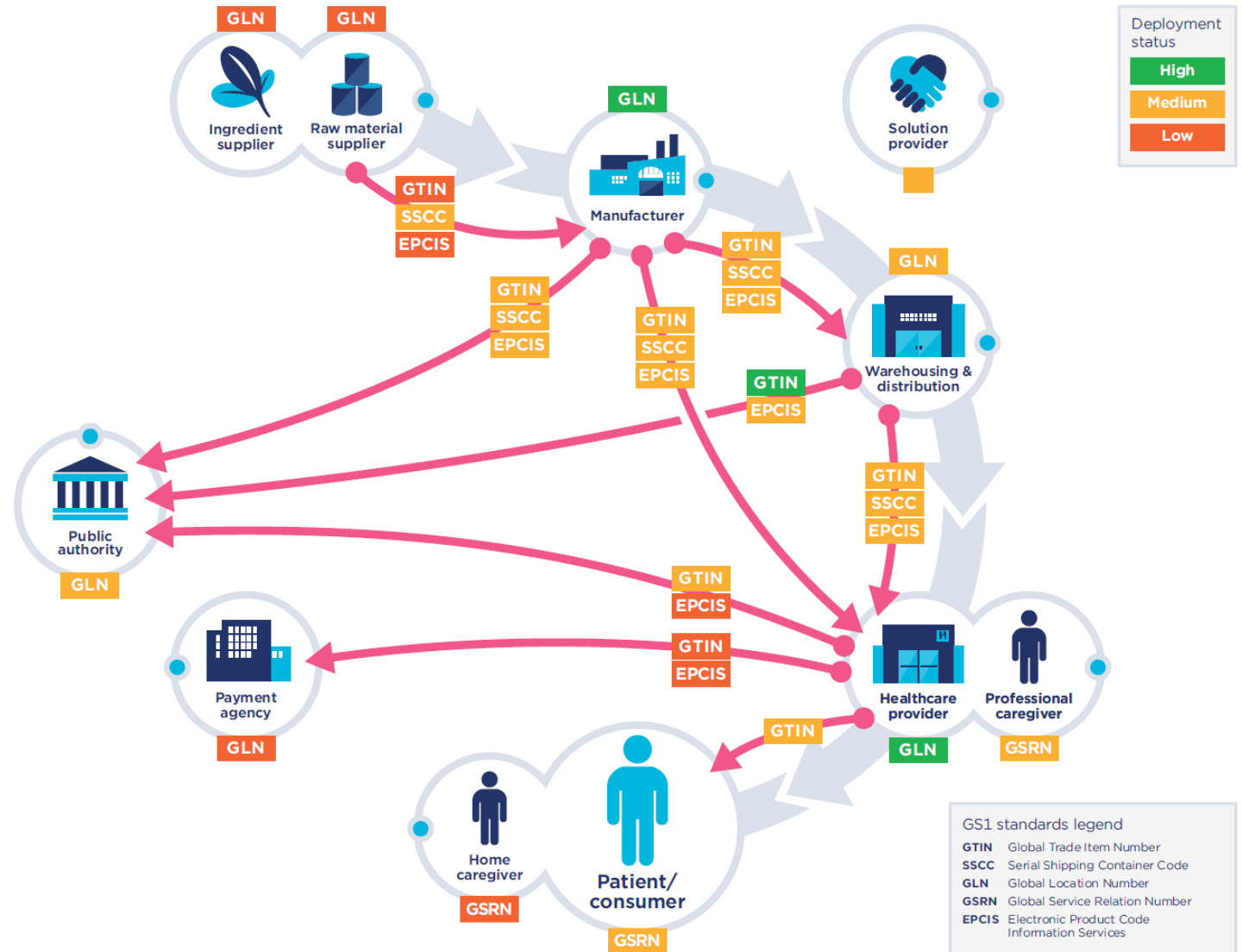
Processes

- Physical flow (+)
- Patient data
- Transactional data (-)
- Master data
- Procure-to-pay
- Traceability
- Recalls/reverse logistics
- Reimbursement

- Relationships
- GS1 standards
- Status 2018
- Status 2022

Strategies

- Current business (+)
- Patient/provider (+)
- Disruptive





철도, 해운, 항공 산업



Usecase
“EPCIS based Transmission of Rail Vehicle Diagnostic Data”.

Holger Strietholt
Marc Damhös

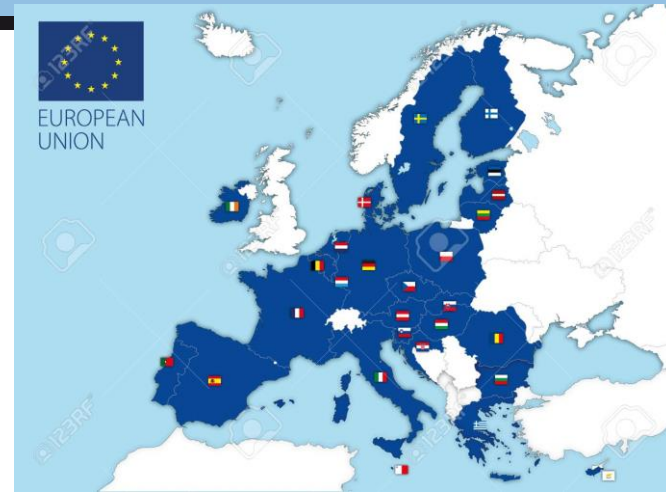


Shippers INDITEX unicef GRIFOLS	Forwarders GEFCO DB SCHENKER DHL DACHSER Agility	Ground Hactl
Solution providers DESCARTES CHAMP ibs UNISYS GS1 Franwell mercator		Industry IATA ULDCORE
Airlines SOUTH AFRICAN AIRWAYS AIRFRANCE CARGO IAG Cargo virgin atlantic cargo AIR NEW ZEALAND CARGO AIR CANADA CARGO Emirates Cargo QATAR CARGO EMVTHAIR	SWISS World Cargo Lufthansa Cargo DHL 449 Cargo KLM CARGO DELTA	

→ 우편물, 택배, 운송품, 공급망 관리 바코드 통합 노력, EU, UPU

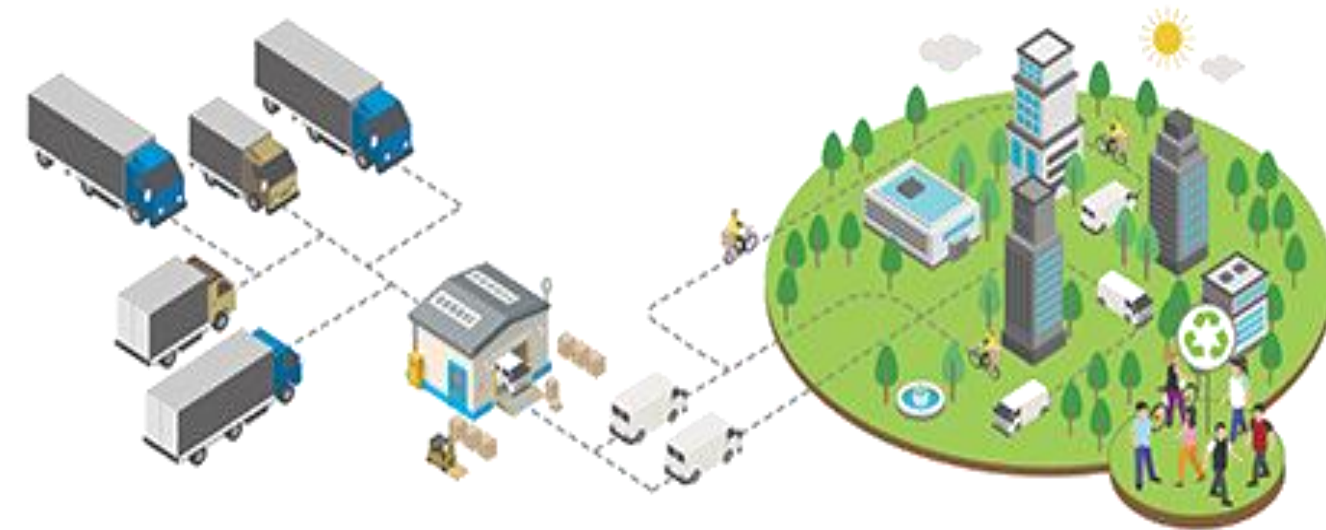


EU Eco2City - City Logistics (도시 물류)



- 국경 통과
- 25,000 개 물류기업 (통합 코드 필요, GS1 SSCC)

EU CEN Harmonized Parcel Label 표준 (2017)

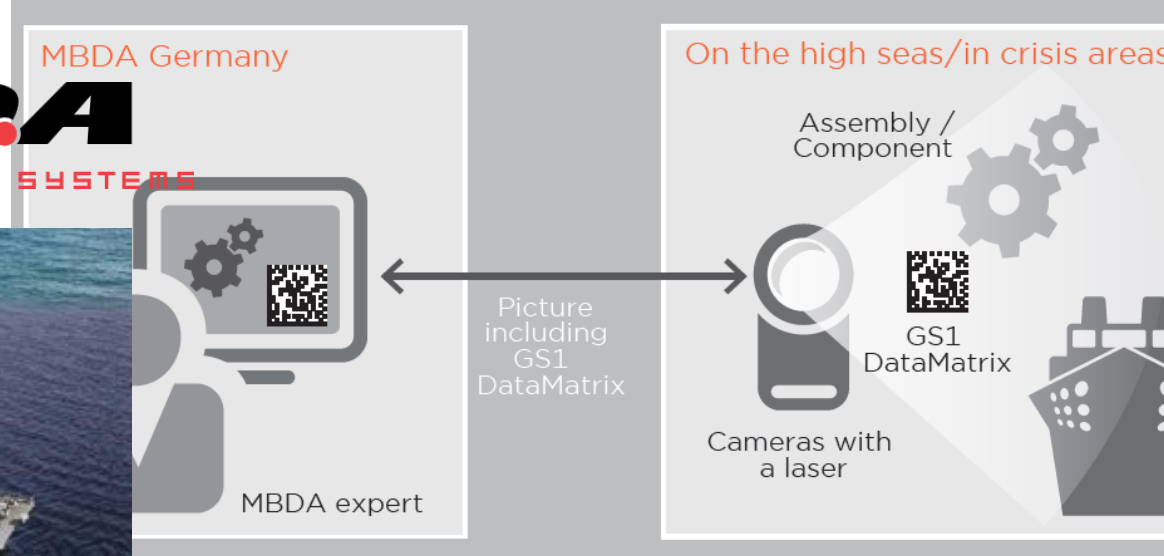
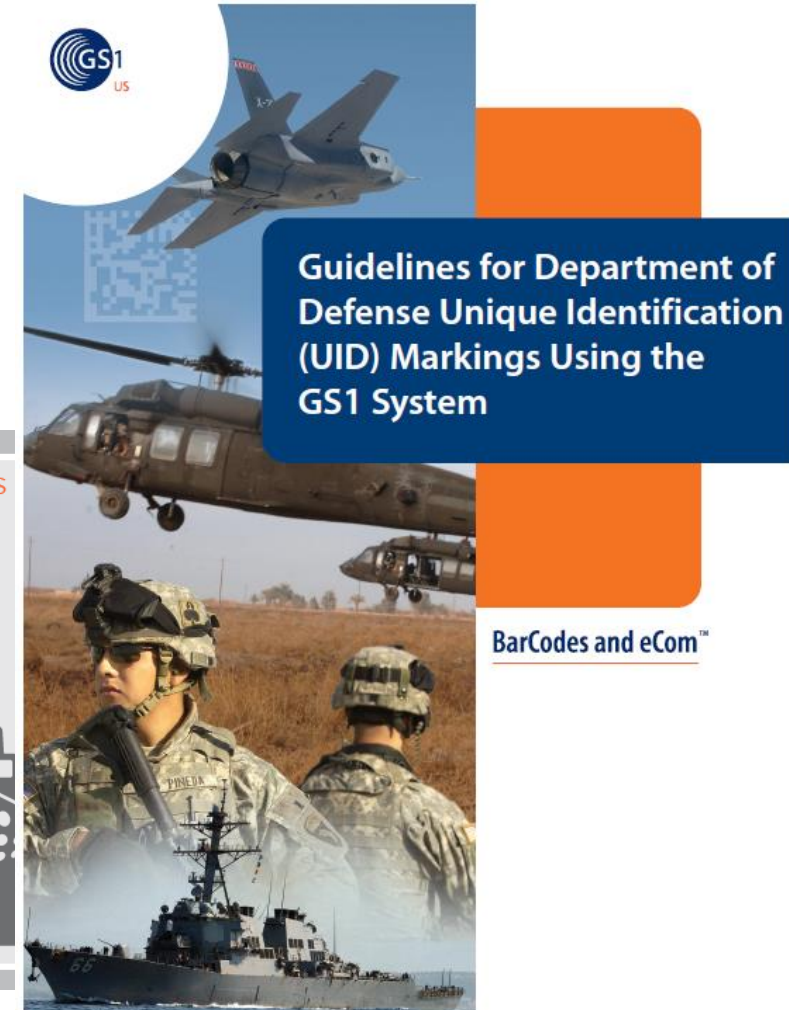




→ 국방: 유럽 방위산업체 MBDA / 미국 전략자산



- GS1 DataMatrix를 사용한 원격지원 시스템 구축
 - 원활한 군수조달을 위해 GS1 표준 식별체계 이용
 - 임무 중 문제 발생 시 신속히 해결을 원격지원에 활용
 - GS1 Serialized Global Trade Item Number(SGTIN) 가 인코딩된 GS1 DataMatrix를 미사일 등의 부품에 부착



→ GS1 과 건설/건축 (BIM, GIS, 디지털트윈)

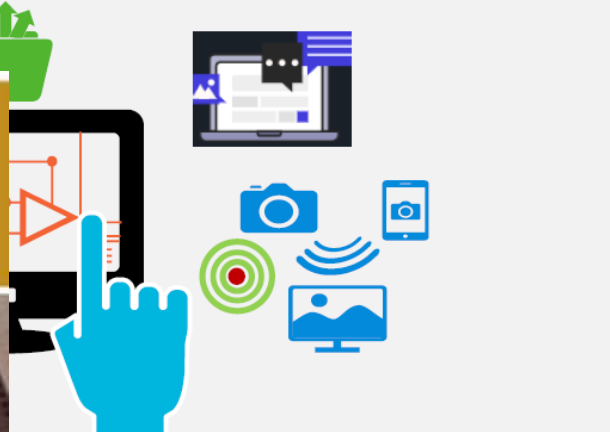
Disruption is everywhere



The GI



Transforming Construction
Building the foundation for greater efficiency and sustainability



buildingSMART International and World Geospatial Industry Council sign an MoU to jointly work on building information modelling (BIM) and geospatial information integration



A collaborative effort to integrate BIM deliverables in building and civil infrastructure and location-based technologies has begun with the signing of the MoU between World Geospatial Industry Council [WGIC] and buildingSMART International (bSI) at the GeoBuiz Summit in San Francisco. bSI and WGIC will work together on developing common initiatives for the use of open standards, best practices and geospatial information to demonstrate greater value and wider applicability of standards,...

[Read More](#)

buildingSMART and GS1 signed a Memorandum of Understanding to advance global standards in the construction sector



(Tokyo, 18th October 2018) – buildingSMART International (bSI) has signed a Memorandum of Understanding (MoU) with GS1 to enable the construction industry to benefit from the combined expertise of both organisations through the use of standards and services they deliver. The use of global buildingSmart and GS1 standards, in particular for product instance identification and exchange of product data, is critical in addressing today's challenges of digitalisation in the construction sector....

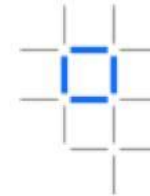
[Read More](#)

→ | 블록체인 (식품, 의약품, Identifier 등)



Platform for Data Capture and Data Sharing

We will capture ERP, RFID, and IoT temperature data, map to GS1 events and formats, and send to Blockchain



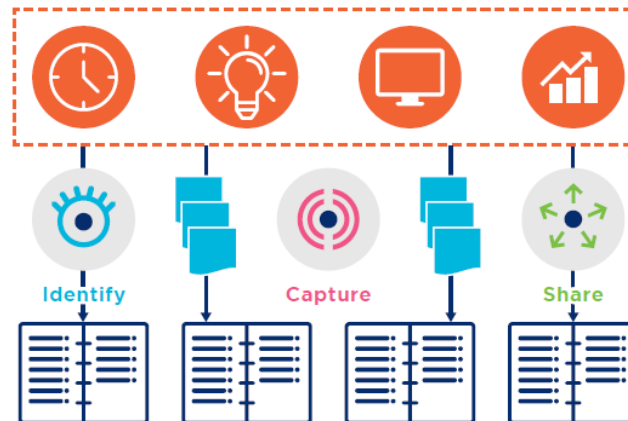
	Received	Issued to Production	Formed & Cased	Palletized	Exit QA Storage	Loaded onto Truck	Arrived At DC	Enter Zone 4	Exit Zone 4	Shipped to Restaurant	Arrived at Restaurant	Consumed
EPCIS Event	Commission	Transformation	Transformation	Payload	Observation	Observation	Observation	Observation	Observation	Observation	Observation	Decommission
Temp Type	Product	Ambient	F									Ambient
RFID Vendor	N/A	N/A										
IoT Vendors	N/A	Digi										

Blockchain and Identify, Capture and Share

System Layer

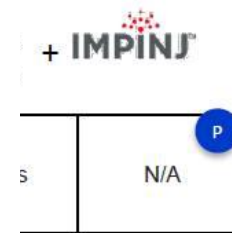
GS1 Layer

Blockchain Layer



Legend

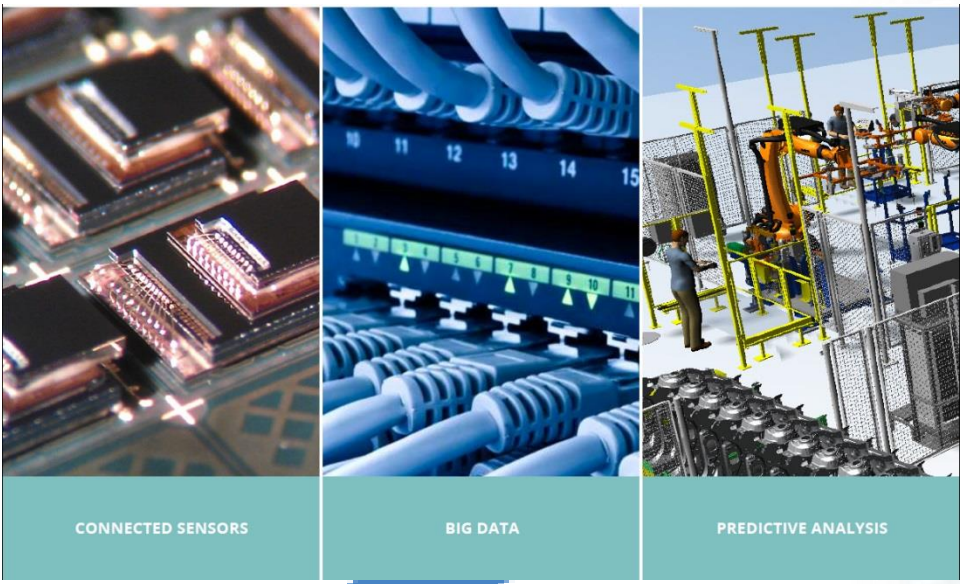
- Systems that generate data
- Data that is valuable
- Data written as a ledger entry here



IBM Blockchain



→ GS1과 표준 데이터는 4차 산업혁명을 지탱하는 글로벌 인프라 (Oliot 오픈소스)



GS1과 데이터는 4차 산업혁명의 뿌리



The global language of business

OVERALL BENEFIT: Improving efficiency & visibility in supply and demand chains

GS1 SOLUTIONS & SERVICES USING GS1 STANDARDS
Solutions: POS / Inventory Management / Asset Management / Collaborative Planning / Traceability
Services: Global (GSMP, GEPIR, Global Registry, Training and Accreditation) & Local (e.g. Certification, Implementation, Training)

GS1 System - Integrated system of standards

GS1 BarCodes Global standards for automatic identification Rapid and accurate, item, asset or location identification	GS1 eCom Global standards for electronic business messaging Rapid, efficient & accurate business data exchange	GS1 GDSN The environment for global data synchronisation Standardised, reliable data for effective business transactions	EPCglobal Global standards for RFID-based identification More accurate, immediate and cost-effective visibility of information
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GS1 Identification Keys (e.g. GTIN, GLN, SSCC, GRAI, GIAI, GSRN, EPC) & Attribute Data (e.g. Best Before Date)



중국 의약품/의료기기/의료자산 데이터



GS1 enables healthcare's digital thread

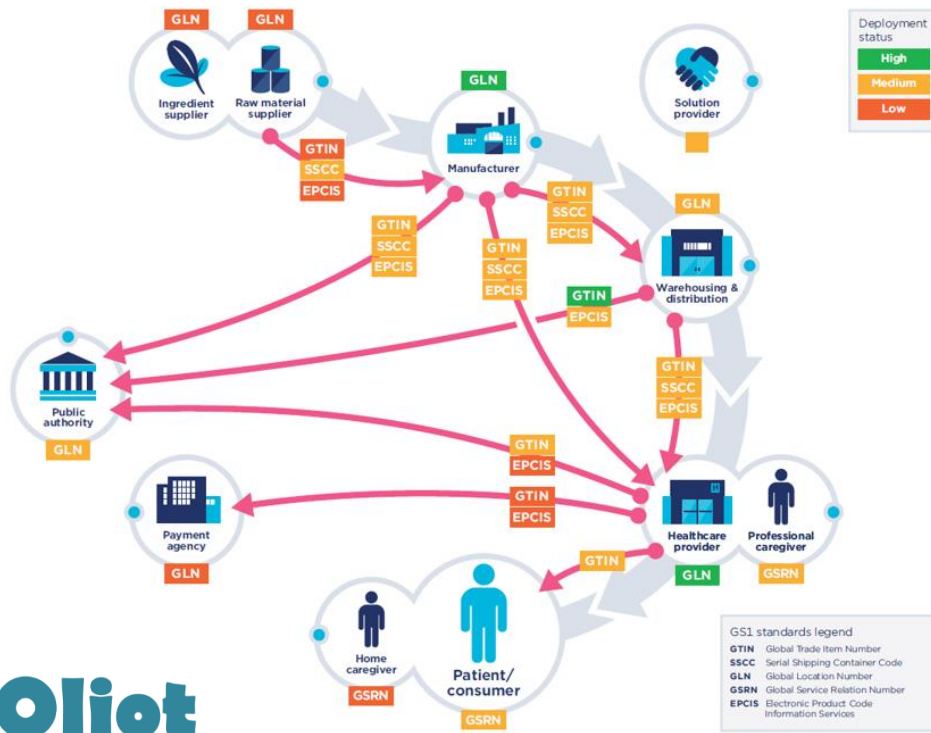
Processes

- Physical flow
- Patient data
- Transactional data
- Master data
- Procure-to-pay
- Traceability
- Recalls/reverse logistics

Strategies

- Current business
- Patient/provider
- Disruptive

- Relationships
- GS1 standards
- Status 2018
- Status 2022



2020



INTERNET OF FOOD & FARM

Trials & Use Cases



16 countries 71 partners



Arable



Dairy



Fruit



Veg



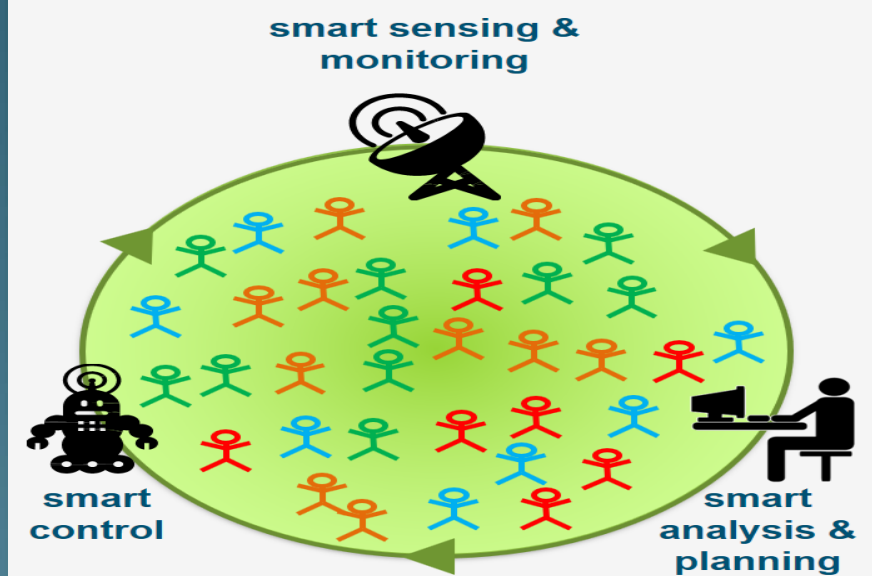
Meat



KAIST

Oliot

Open Language for Internet of Things



MULTI-ACTOR APPROACH

End-users	IoT integrators
Infrastructure Providers	Researchers



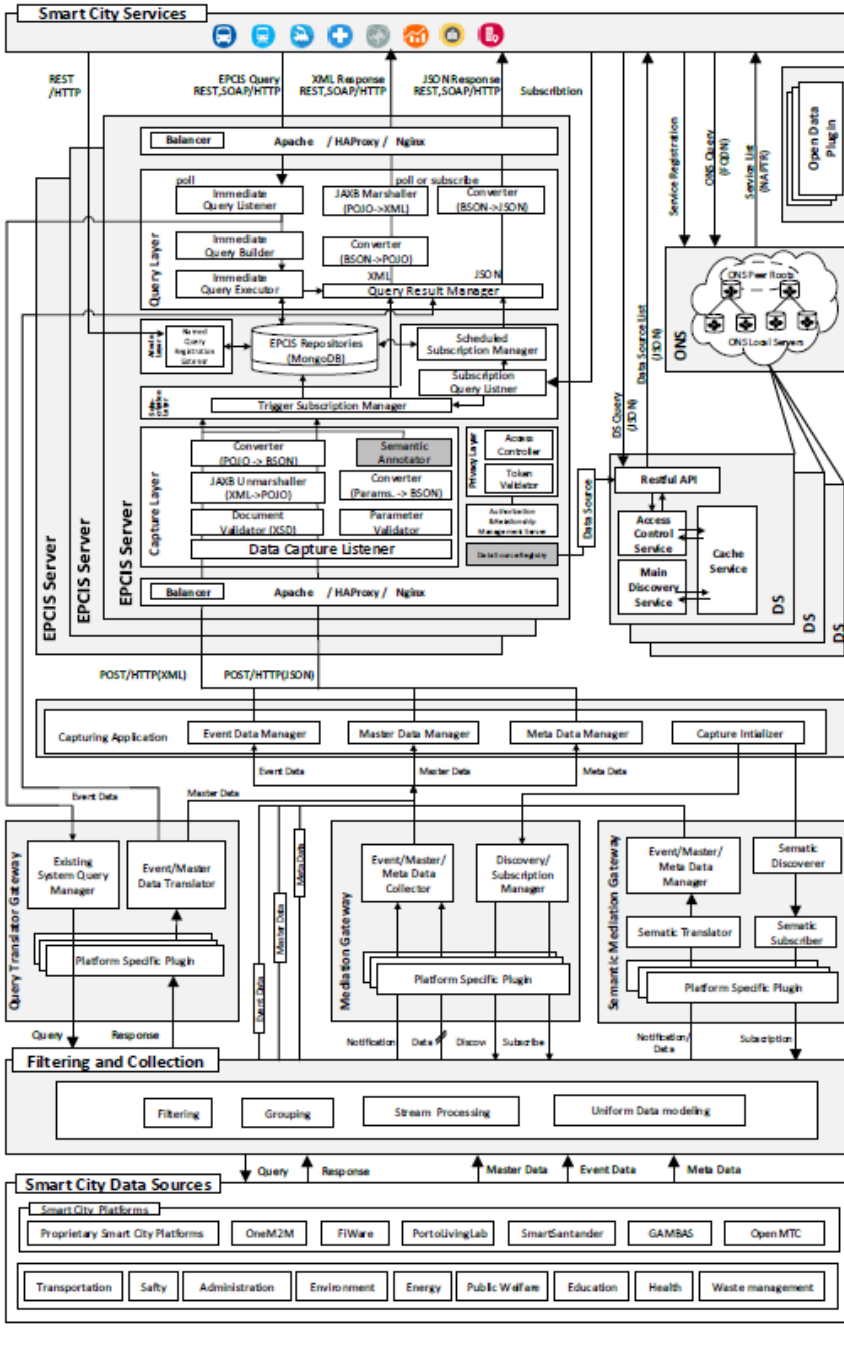


Figure 1: Oliot-OpenCity: Open Standard Interoperable Smart City Platform

GS1 / Oliot 스마트시티 데이터/서비스 허브 플랫폼

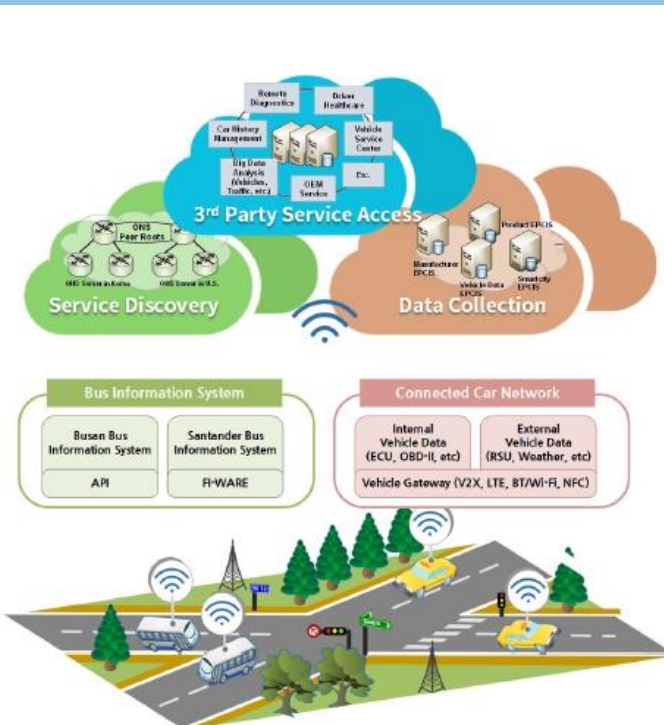


Figure 5: Oliot-OpenCity use cases



Figure 8: Smart City Service Scanner Use Cases Scenario
© Auto-ID Lab Korea / KAIST

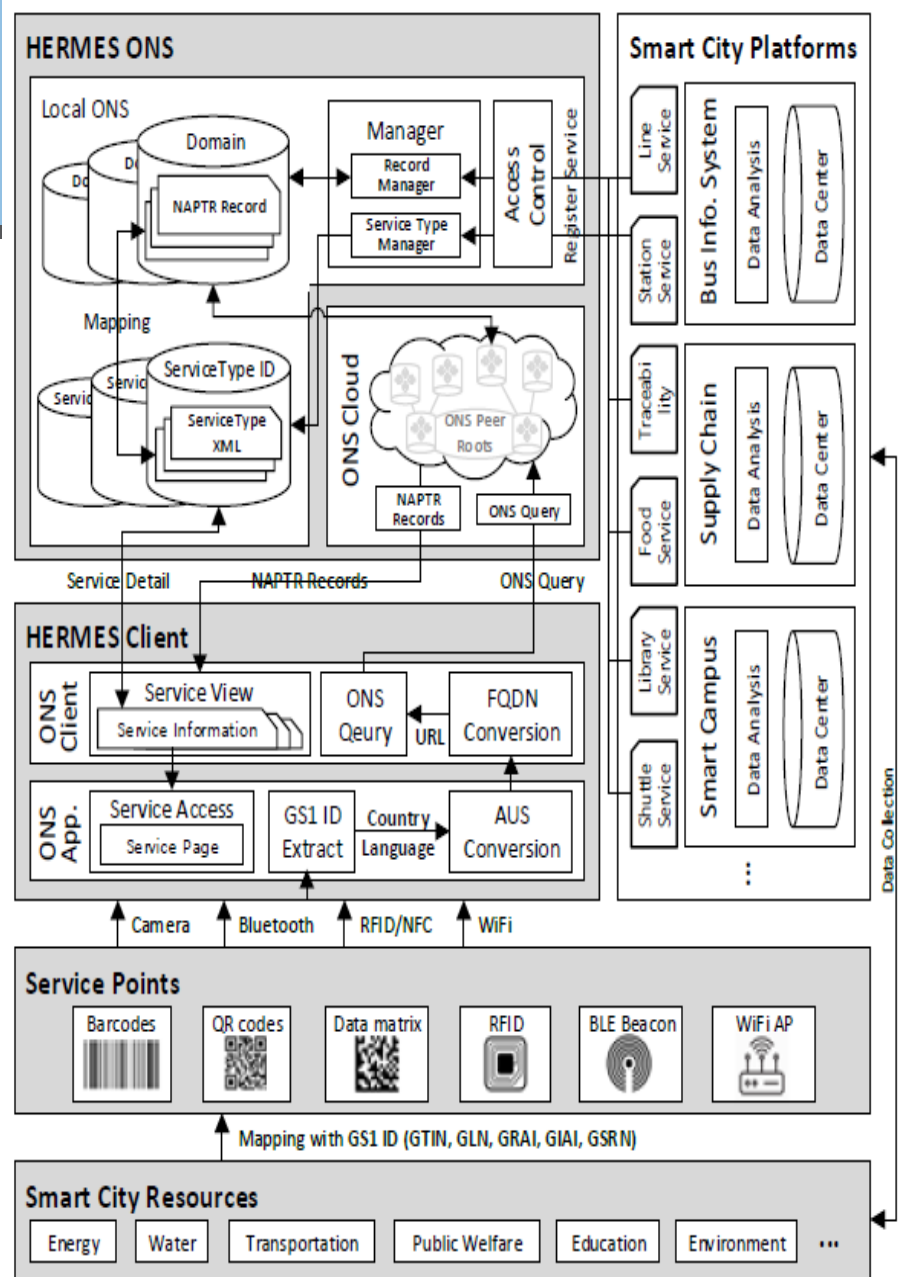


Figure 2: Smart City Service Scanner architecture

Data Collection



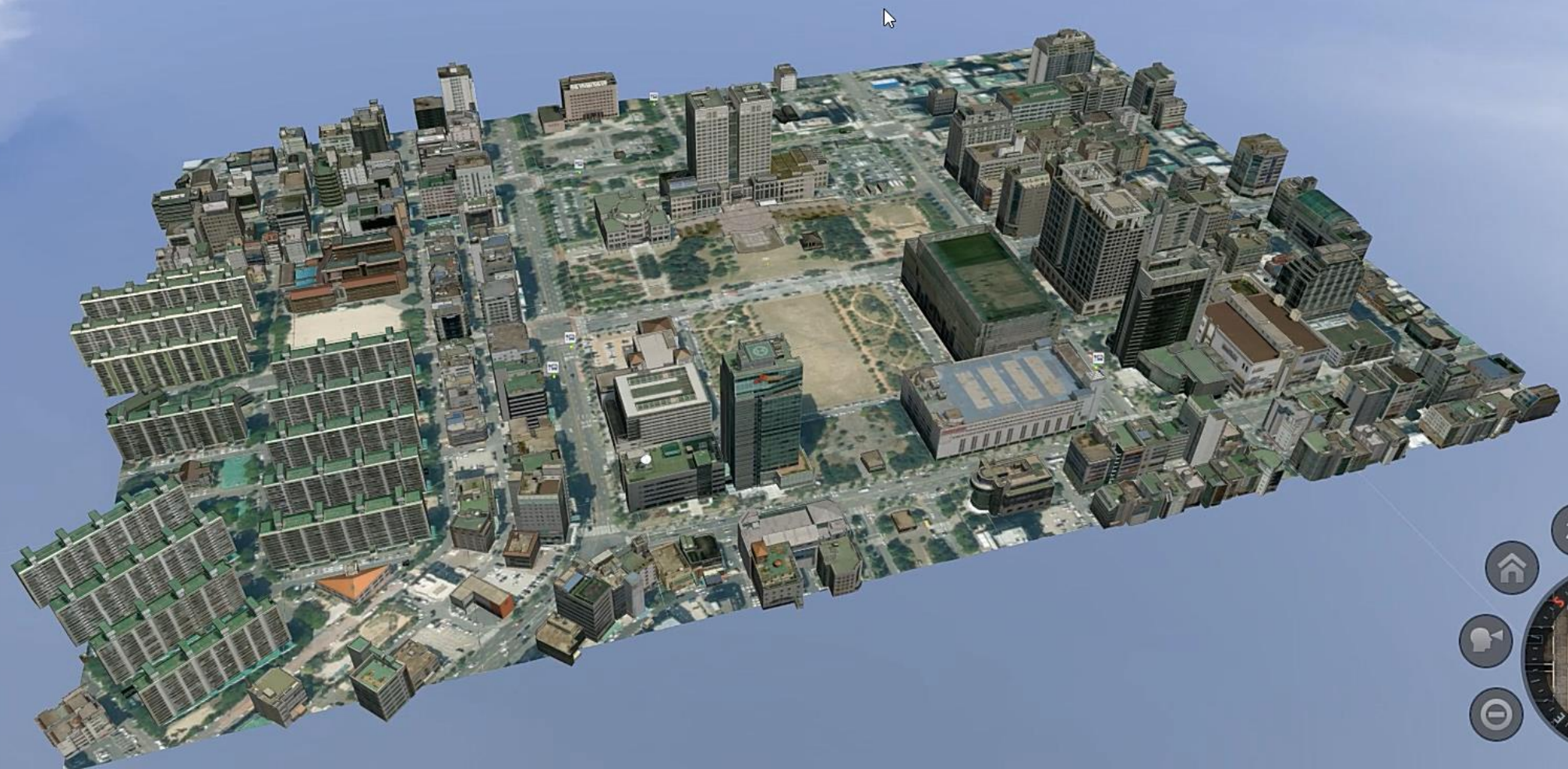
KAIST GS1 CONNECTED CAR
chérie 2018



대전 시청 북용동 학하동 신탄진동 수영동

🔍 검색

지도 위성 그리드



Call for collaborations with Industries



Contributors

Researchers

Standardsville



