The Global Language of Business

Digital is good, Sharing is better

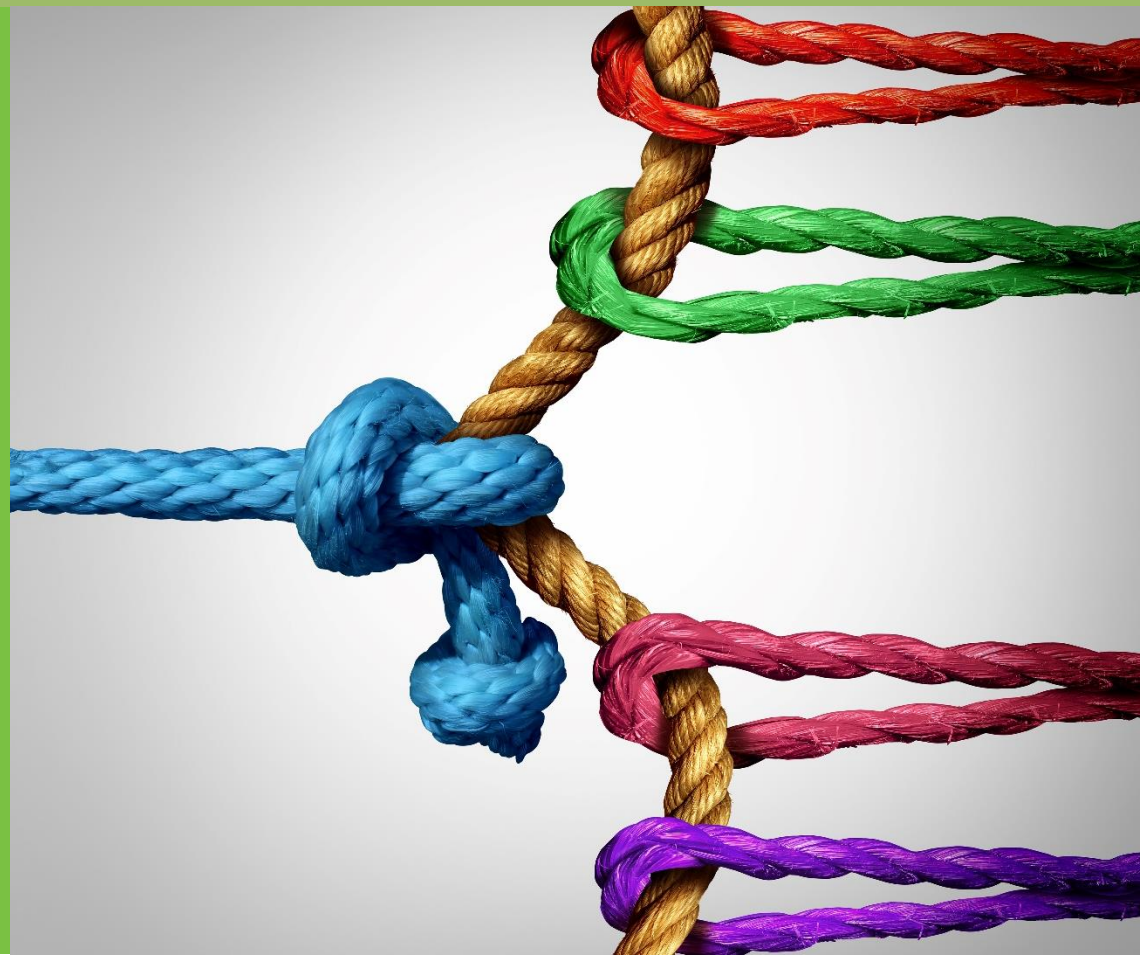
How GS1 standards enable Technical Industries

Lead : Enzo Blonk – Technical Industries – Global Office
Co-chairs : Alexander Brage Hansen - Løvenskiold Handel – MAXBO
Thorsten Kirschner – GS1 Germany
Industry & Standards event, Oct. 10th, 2017 - Brussels

Agenda

1	Welcome & Anti-Trust	13:30-13:40
2	Intro to Technical Industries	13:40-14:10
3	Focus 1 : Construction	14:10-14:50
4	Focus 2 : Defence	14:50-15:30
	COFFEE BREAK 	15:30-16:00
5	Focus 3 : Railways	16:00-16:35
6	Q&A – Open discussion	16:35-16:55
7	Wrap –up & Closing	16:55-17:00

1. Welcome



Welcome

Co-Chairs

Alexander Brage Hansen
Løvenskiold Handel / MAXBO (ex-GS1 Norway)

Thorsten Kirschner – Senior Sector Manager Technical Industries
GS1 Germany

2. Technical Industries - a brief intro

Standards are….

A few facts…

- Items in TI are **not FMCG** – they have a life expectancy of up to 60 years!
  - Shift from Supply Chain Efficiency to **Product Life Cycle** visibility
  - Identification @ package level is not sufficient → **Direct Marking** of items
  - Data on usage → supports **new business models** (service-oriented)
  - **No** GTIN **reuse** acceptable !

- Some players in Technical Industries have a **larger supplier base** than the world's biggest retailer (GS1 Germany)

The situation

Defence

Engineering

Energy

Mass transit

- **Aerospace**
- **Automotive**
- **Maritime**
- **Railways**

Mining

Construction

✓ Similar challenges

(highly complex / interdependent supply chains)

✓ Counterfeiting

✓ fierce price competition

✓ a digital “revolution”.

Proprietary data systems and different internal product identification methods

→ **limited traceability** and **interoperability**.

Common need is a Globally Unique Identifier

As the key to :

- **Material Master Data** (product description and attributes structured)

And as an enabler for:

- **Part Authentication** (counterfeit)
- **Inventory visibility**
  → predictive replenishment
- **MRO** (Maintenance, Repair & Overhaul) processes more efficient
  → Preventative maintenance, real-time performance monitoring
- **Lean manufacturing** (smart factory / industry 4.0)
- **Systems interoperability**
- **Warranty management / regulatory compliance**

Mega-trends

Changing landscape

"Without interoperability, at least 40 percent of potential **[IoT/Industry 4.0]** benefits cannot be realised. Adopting open standards is one way to accomplish interoperability."

McKinsey Global Institute, "The Internet of Things: Mapping the Value Beyond the Hype," June 2015

Changing landscape

In a Cisco survey of more than 600 senior executives in 13 countries—from both industrial machine builders and end-user manufacturers—86 percent said the transition **from product-centric to service-oriented revenue models** is a core part of their growth strategies..”

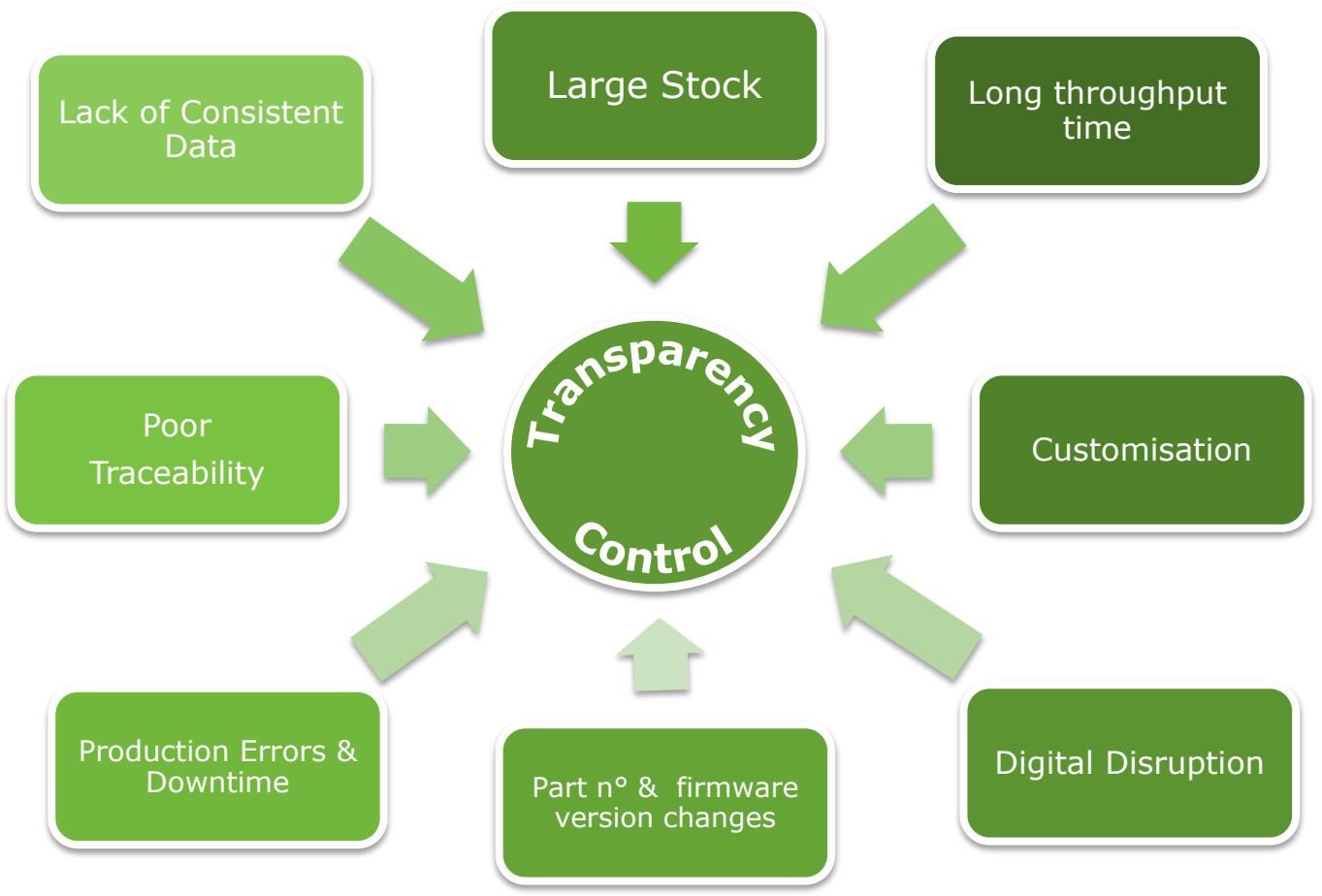
Cisco – The Digital Manufacturer: Resolving the Service Dilemma – November 2015

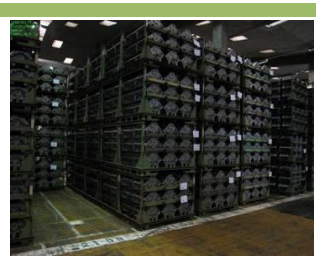
Changing landscape

"Industry 4.0 connects embedded system production technologies and smart production processes to pave the way to a new technological age which will radically transform Industry and production value chains and business models… Industrial Production machinery no longer simply "processes" the product", but **the product communicates with the machinery to tell it exactly what to do**.

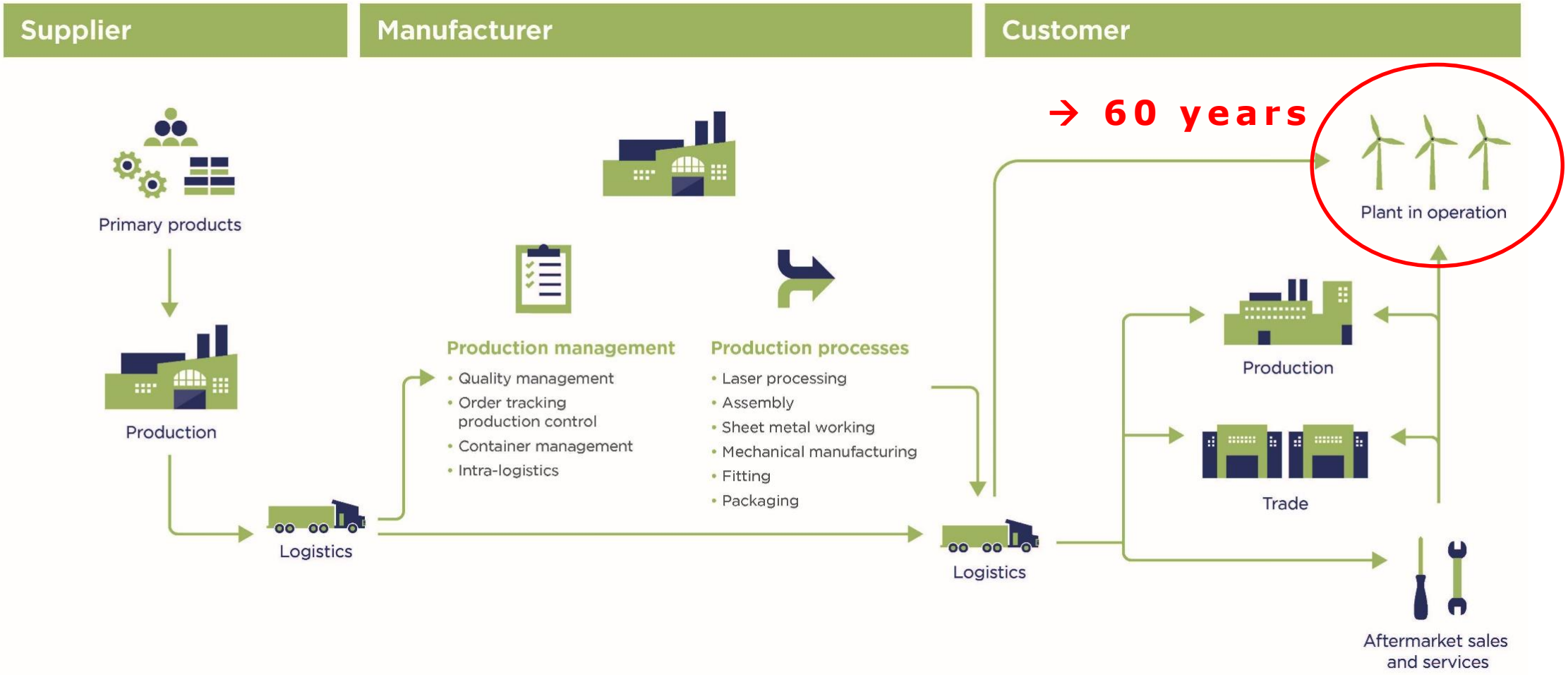
GTAI German Trade and Invest: Industry 4.0 – The Future of Productivity and Growth in Manufacturing Industries – April 2015

Lack of transparency is the central issue that we are trying to solve

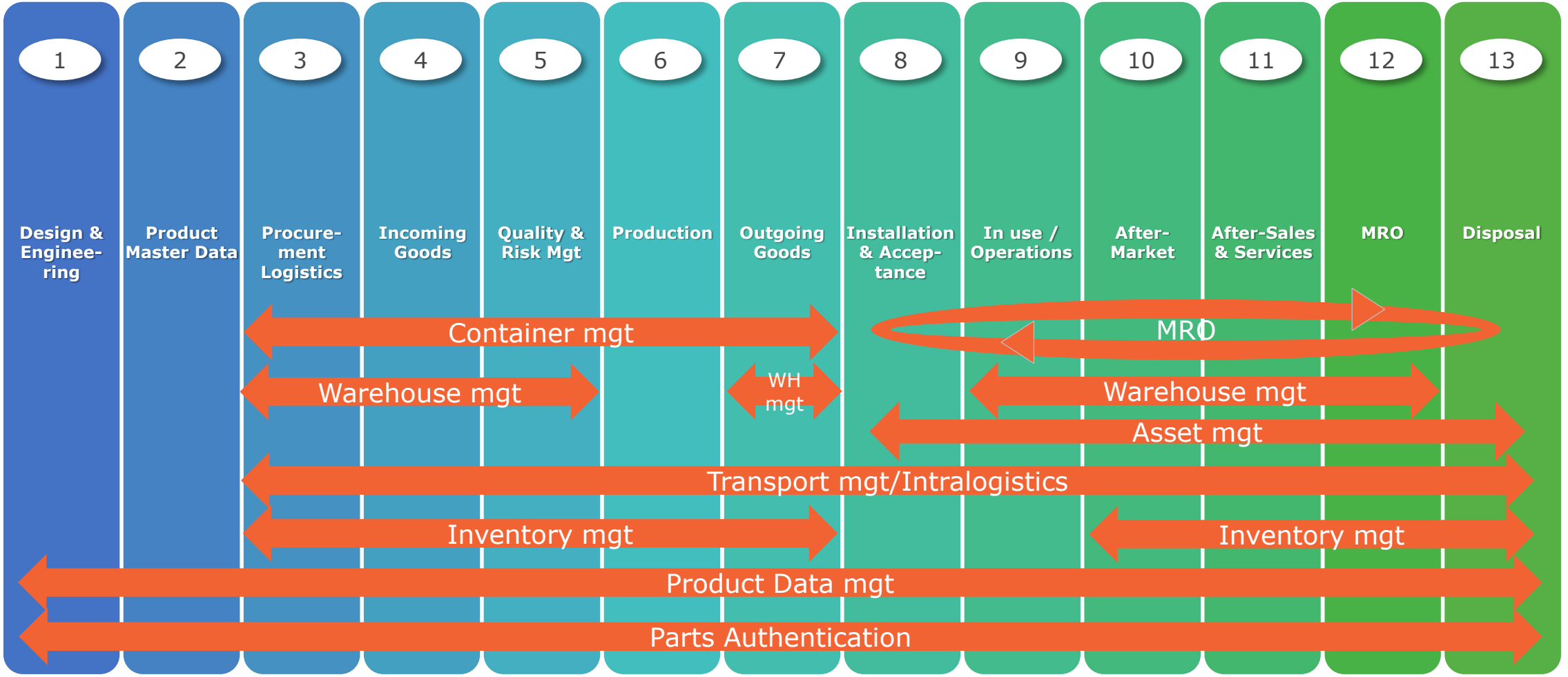




What Technical Industries is
From a Supply Chain point of view



What Technical Industries is
From a Product Lifecycle point of view

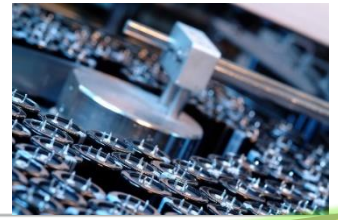


All of these key business processes are foundational to Smart Industry strategies

SMART INDUSTRY *(Industry 4.0)*

Production

- Mass customisation
- Predictive replenishment
- Performance / condition monitoring
- Preventative Maintenance
- Reduction of production downtimes
- Stronger / Lean manufacturing organisation



Quality & Risk mngt

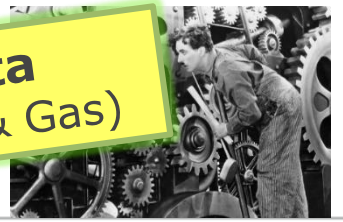
- Item authentication for
  - anti-counterfeiting
  - brand protection
- Systems interoperability
- Regulatory compliance
- Returns management / reverse logistics
- Warranty management

Logistics

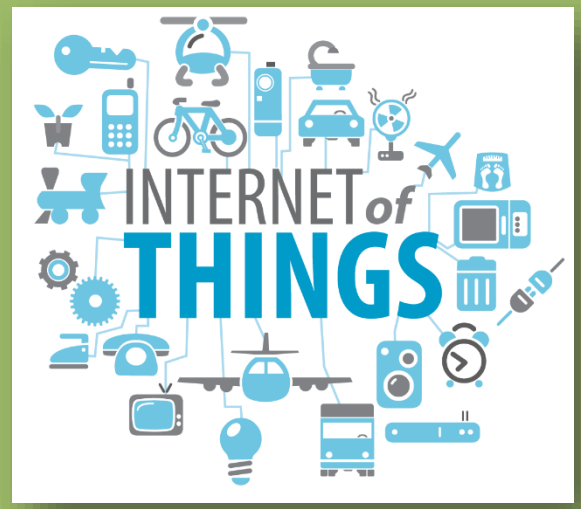
- Speed up goods in & goods out
- Smaller stocks & cost reduction
- Reduction errors
- Cost-savings across entire supply chain
- Agile processes
- Procurement process

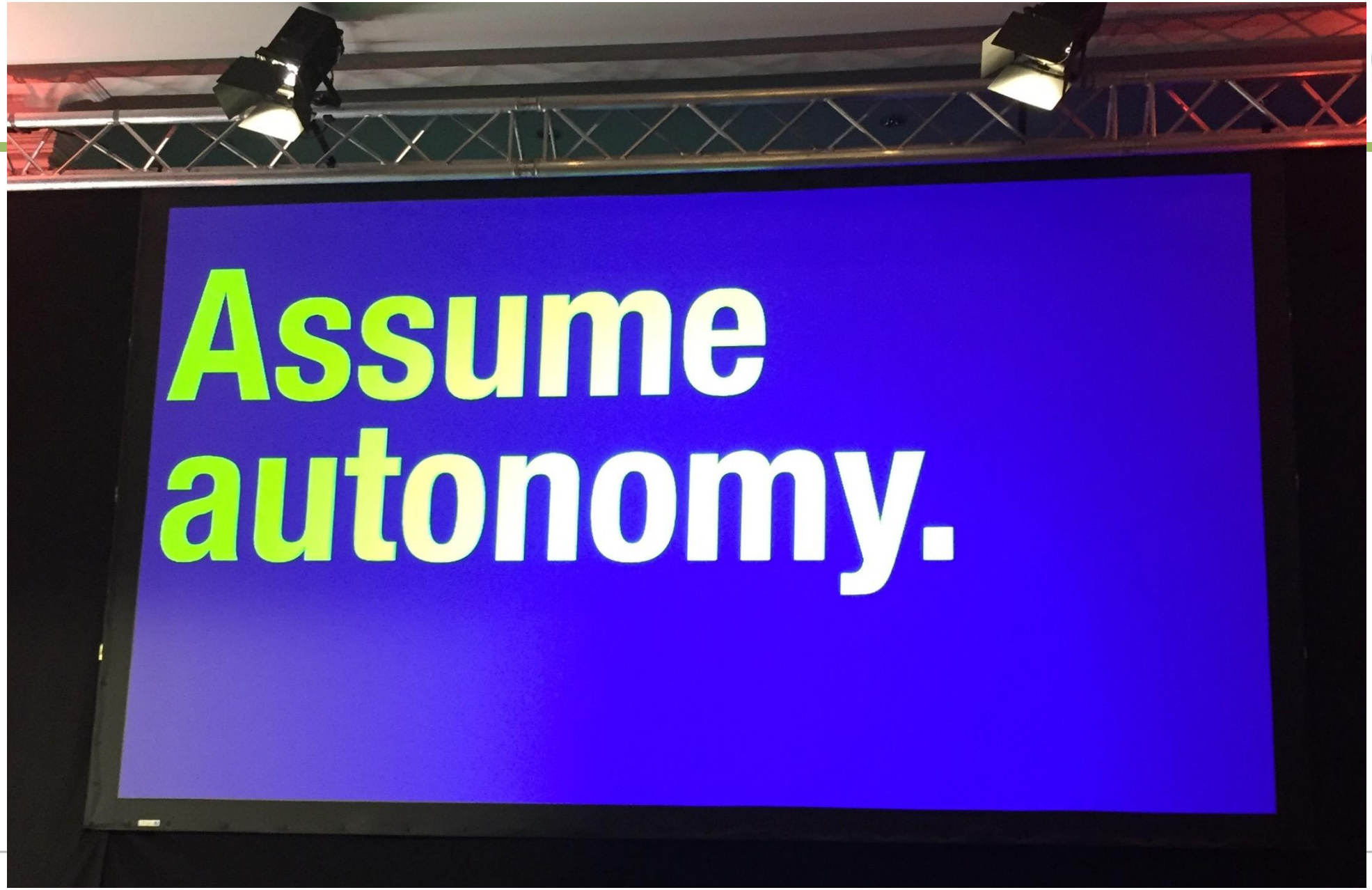
MRO

- Using data to improve maintenance process
- Real-time condition monitoring
- Increase safety (avoid incorrect use or unlawful substitutions)
- Module-based smart maintenance strategies
- Unambiguous identif. parts & software versions
- Remote maintenance



Trend : increased need for structured Material **Master Data**
(requirements expressed by CPG, Construction, Defence, Mining, Oil & Gas)





Industry 4.0

- aka **IIoT = Industrial Internet of Things**
- Huge boost for more efficient use of **robotics**.
- Linking elements → valuable data → **analytics** & **process optimisation**
  - Predictive Replenishment, Preventative Maintenance, "Pay-per-Use"
- **Security of data** = essential for successful & efficient **Smart Industry**.

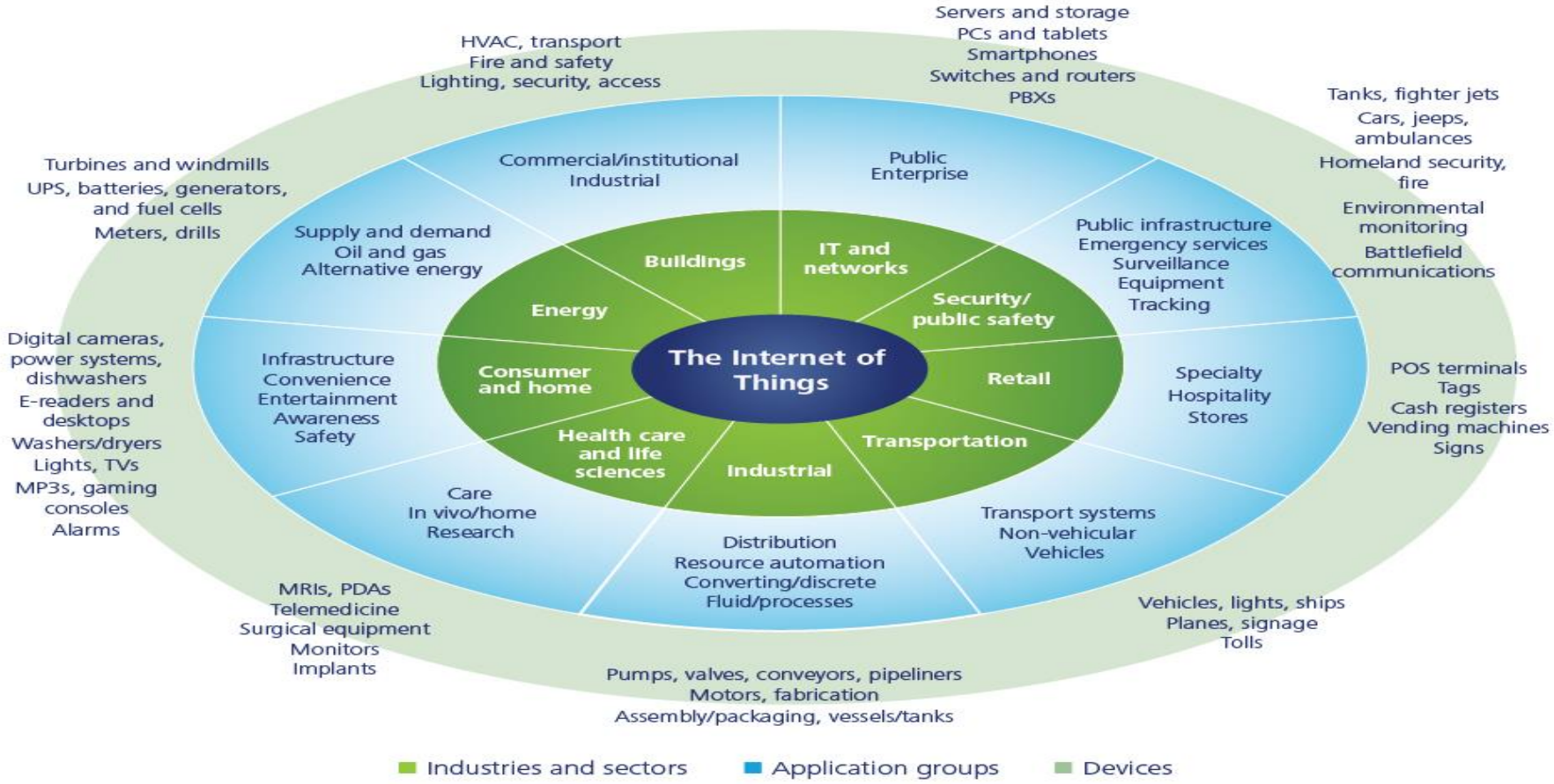
To **raise market confidence**, **support** Smart Industry **strategies** and make sure **investments** in future products and services **bear fruit** in the long run, global security and data **standards** are required.

- Currently more than 3.000 communication standards, only proprietary ID standards
- **Unique identification** within the **global** supply chain and along the item's lifecycle is an essential part in this Digital Industry strategy.

Internet of Things - drivers

1. Expectations of companies and consumers that all things will be "**connected**"
2. Increasing **capabilities** and **lower cost** of micro-controllers and communication technologies
3. An **explosion** of **"cloud-based" platforms** for collecting, processing and sharing data, resulting in an increase of revenues and a reduction in inefficiencies

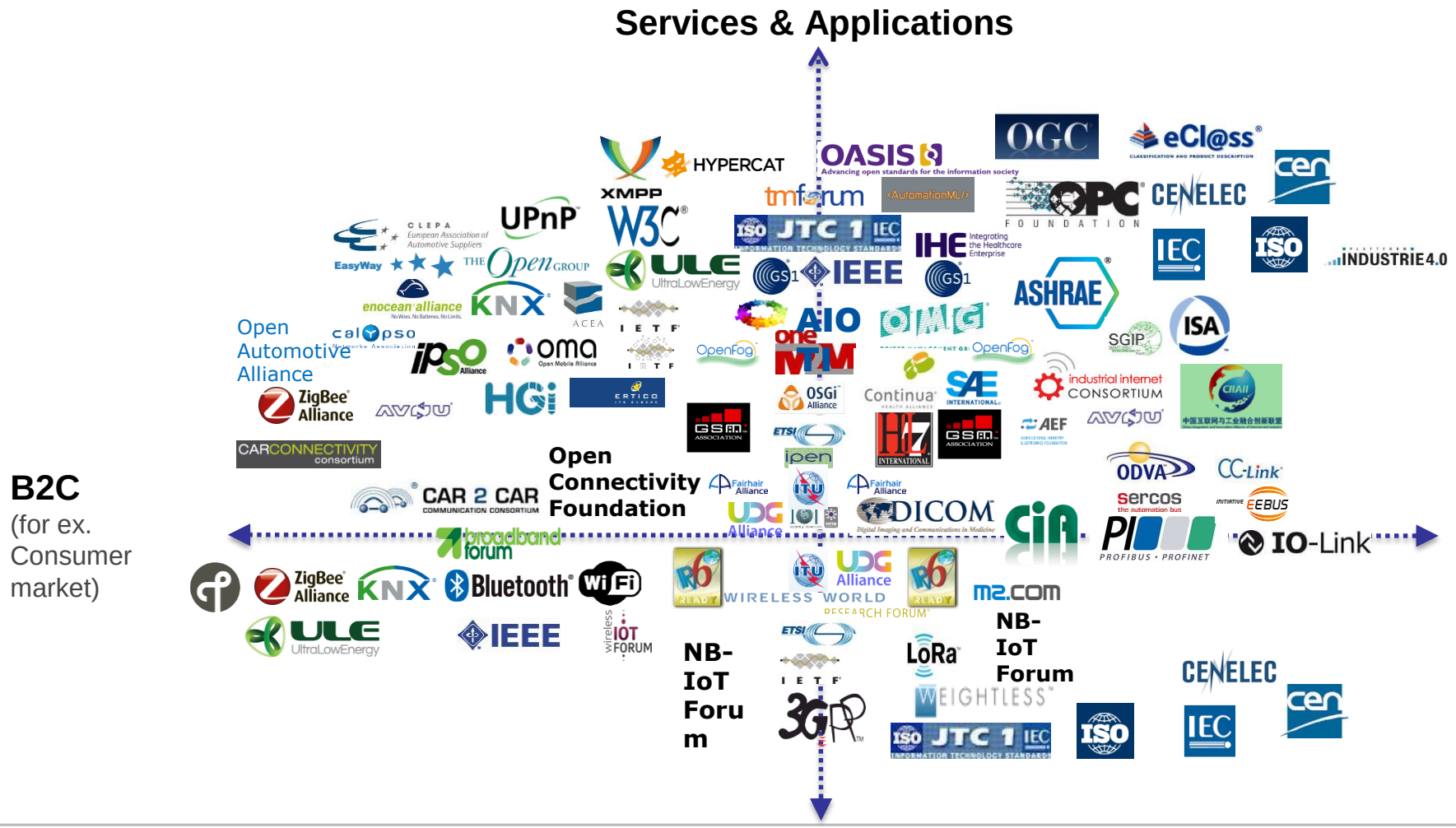
The scope of IoT is wide



Source: Beecham Research, *M2M/IoT sector map*, 2013.

Graphic: Deloitte University Press | DUPress.com

Many organisations deal with IoT
(Source: Alliance for IoT Innovation – www.aioti.org)



Internet of Things and Standards

"As the Internet of Things grows we need an agreement on system architecture and open standards.

If leaders don't think this through, and don't create a framework for it to succeed, there's a real chance that the full potential of the Internet of Things could be compromised".

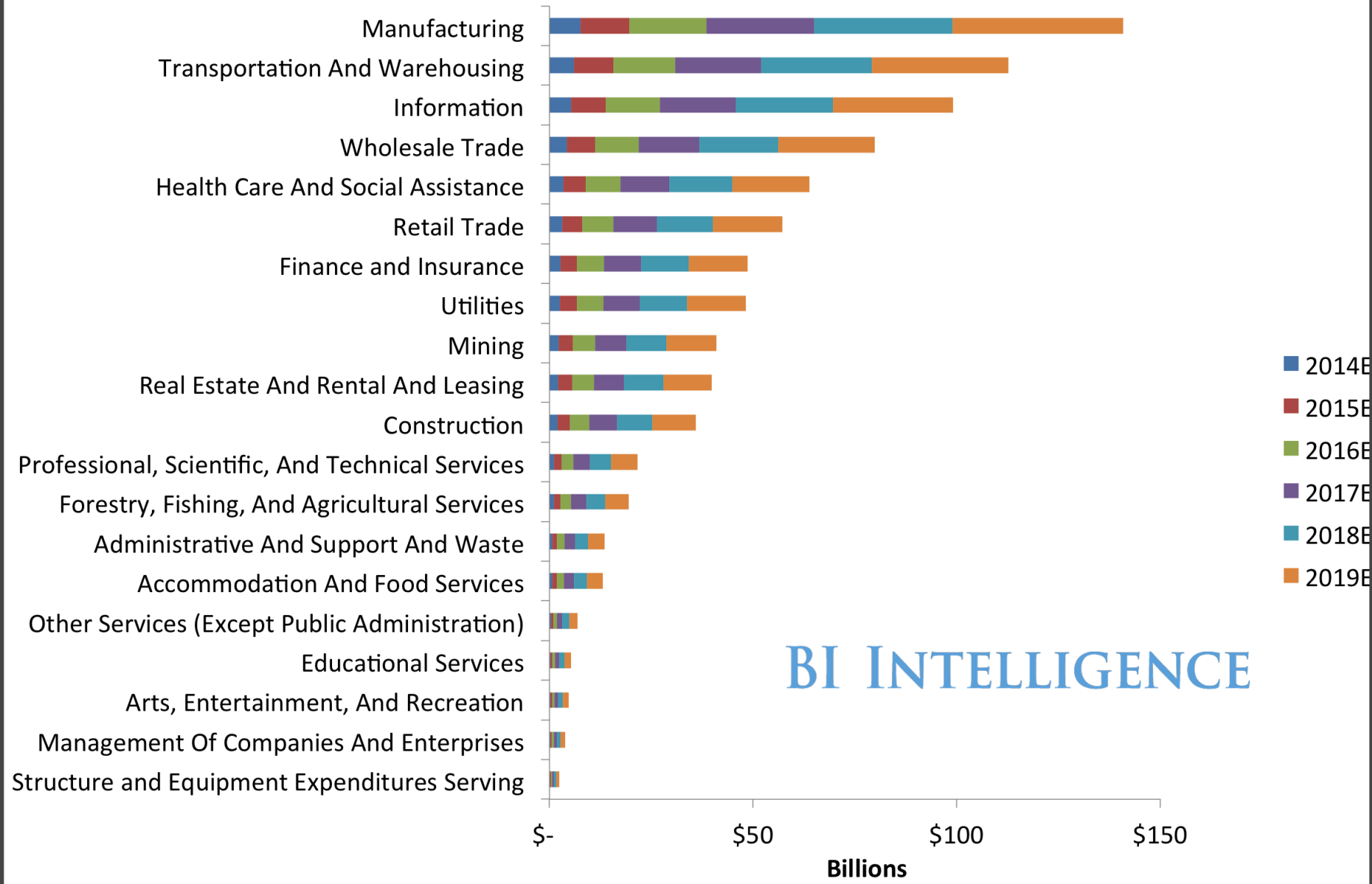
Sanjay Sarma
Chairman, GS1 Innovation Network
Professor, VP for Open Learning, MIT

Industrial IoT : Industry 4.0 levers

„The "Digital Compass' supports companies in finding tools that meet their requirements"

Where do the GS1 standards fit in?

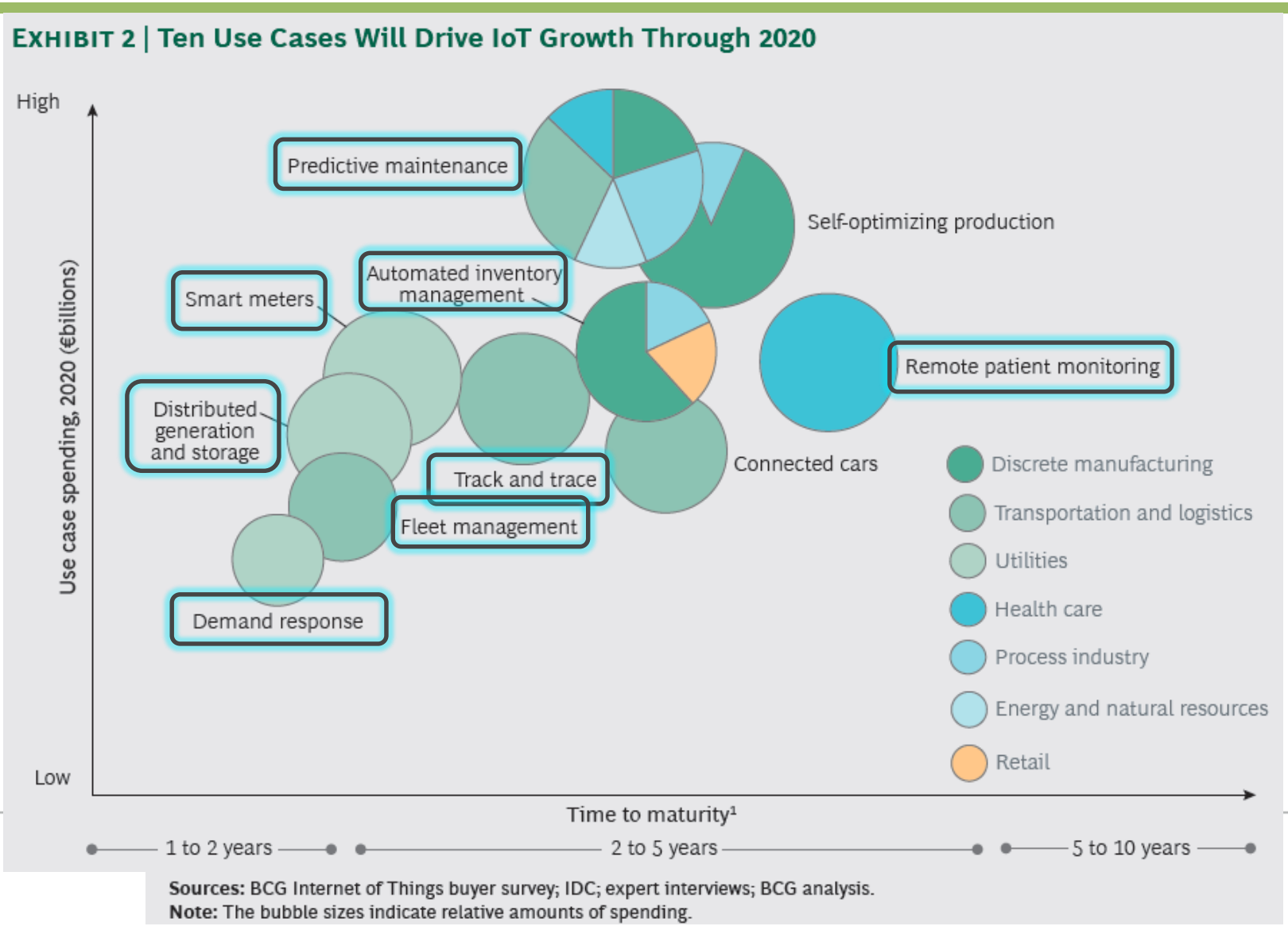
Investments In IoT Solutions By Industry



Source: BI Intelligence Estimates

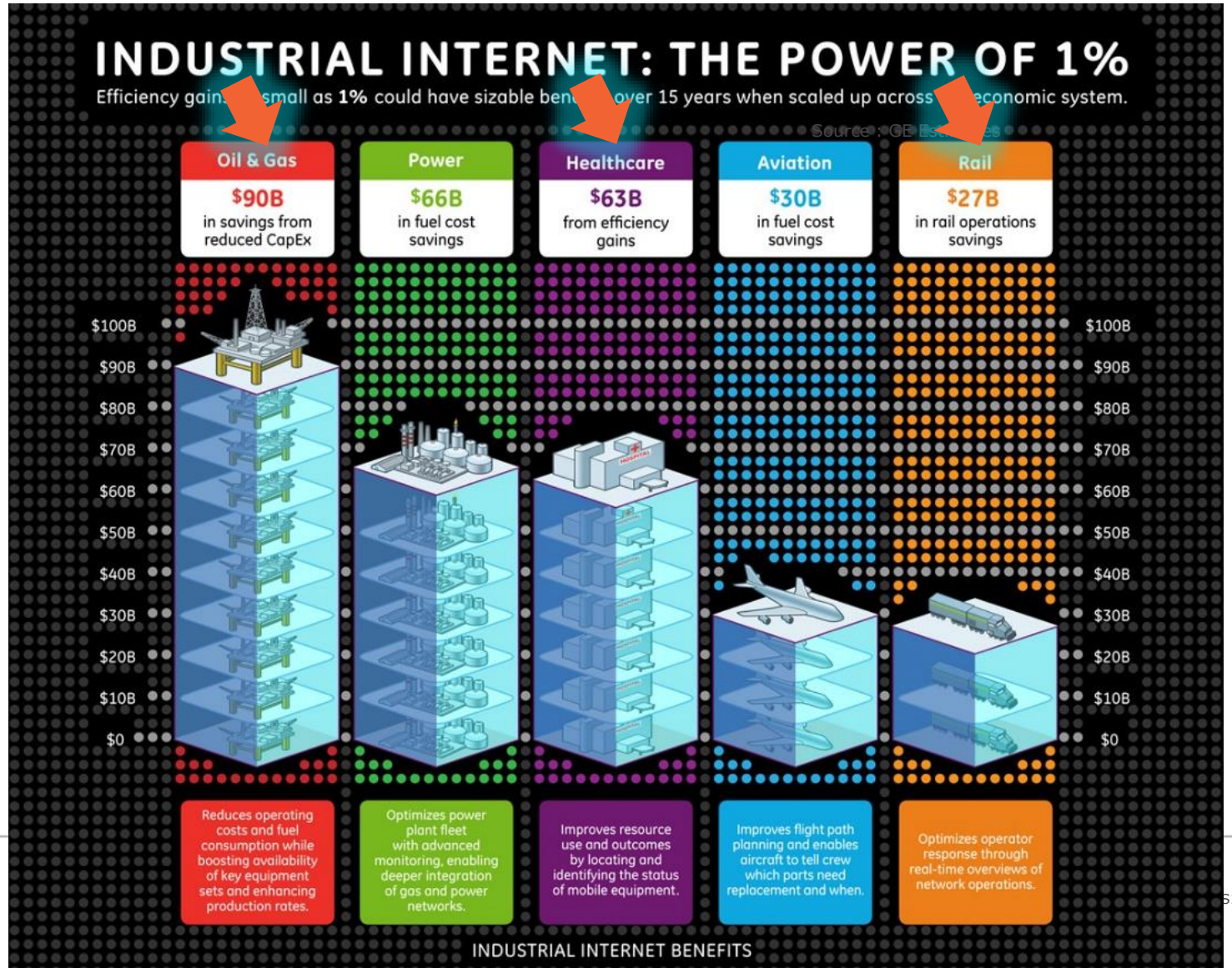
Use Cases driving IoT Growth

Where do GS1 standards fit in?



Efficiency gains

Where do GS1 standards fit in ?



GS1 and IoT

- The Internet of Things is there here and now
- IoT is a concept rather than a specific technology
- Very much everything GS1 does is part of the Internet of Things

http://www.gs1.org/standards/internet-of-things

- The current global activities in the Technical Industries sectors are fundamental for the success of IoT Industry 4.0 strategies

Focus / Strategy 2017-2018

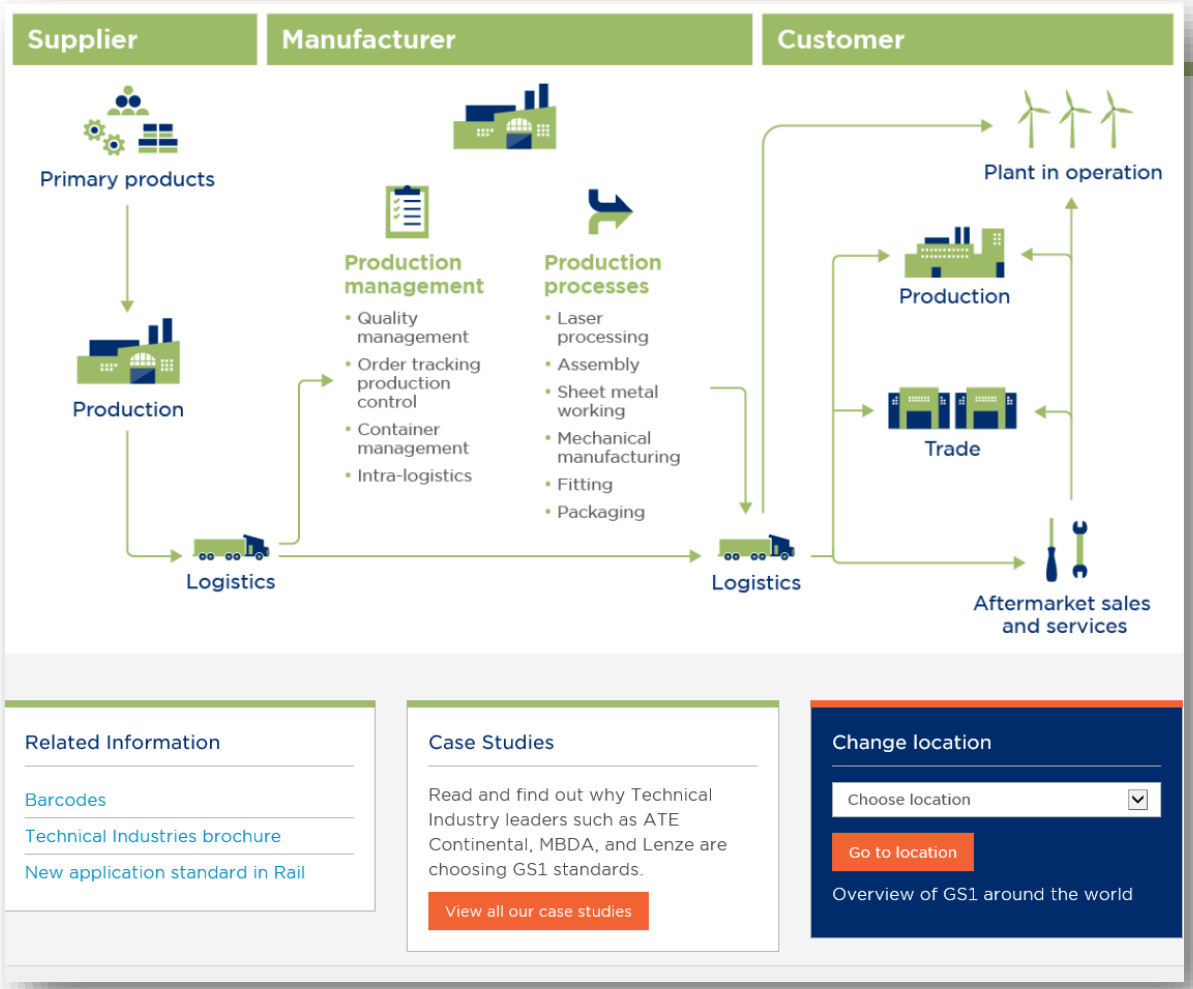
- Construction
  - High level of collaboration options with sector associations reg. global activities/regulations around BIM (Building Information Modelling)
  - In spotlight are Identification, EPC and Data (Material Master Data, Data Quality, Authentication)

- CPG
  - Level of GS1 awareness and commitment
  - Match with GS1 key processes in TI (ID and Master Data) → basis for sector's IIoT strategies

- Defence
  - Renewed interest / commitment from NATO (AC-135 & AC-327) and NCB (National Cofid. Bureau)
  - GS1 standards complementary to NCS (NATO Codification System)

- Railways
  - Commitment from European & Australian Industry (GSMP & IE), current implementation
  - Work started in 2012, Application Standard 2016 to serve as blueprint for other TI sectors

Material / References



https://www.gs1.org/technical-industries

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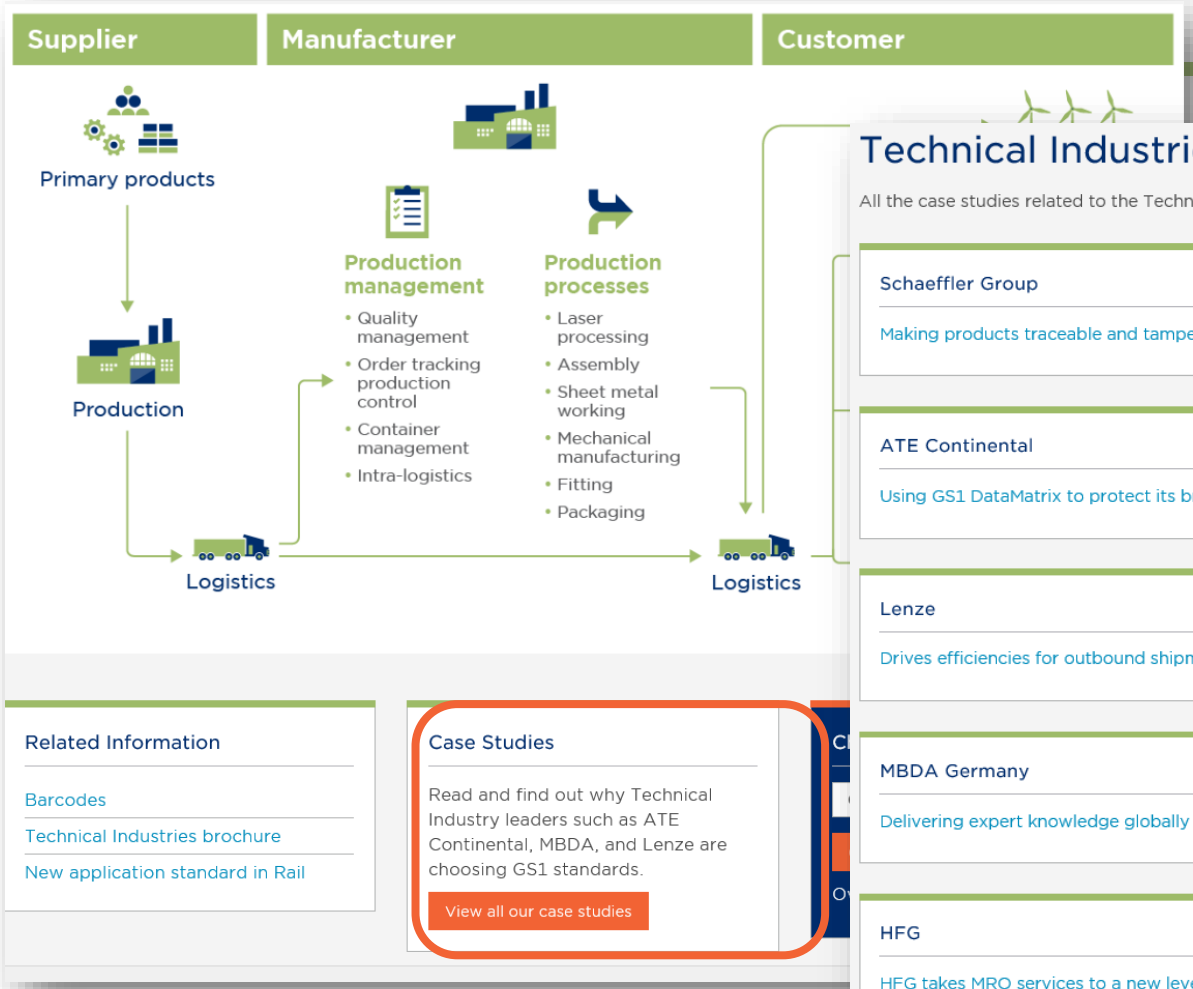

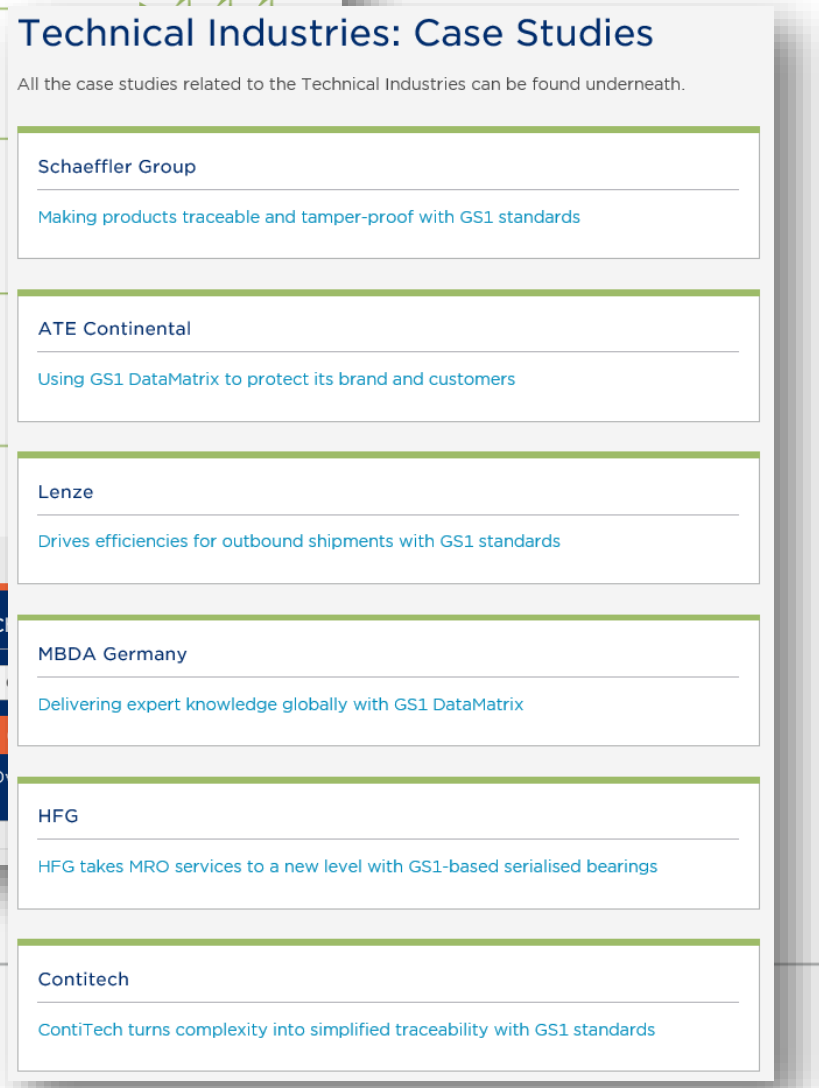

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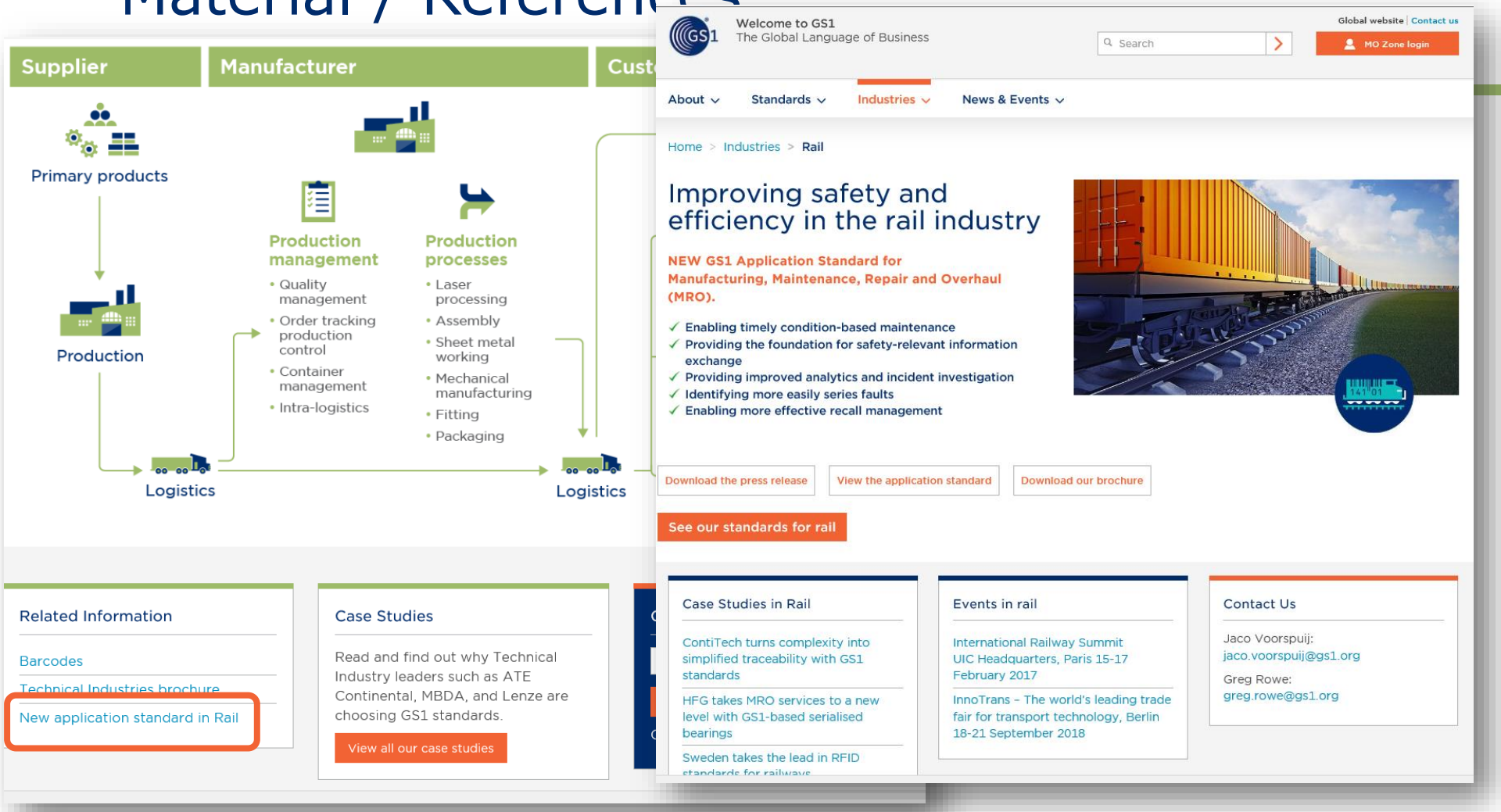

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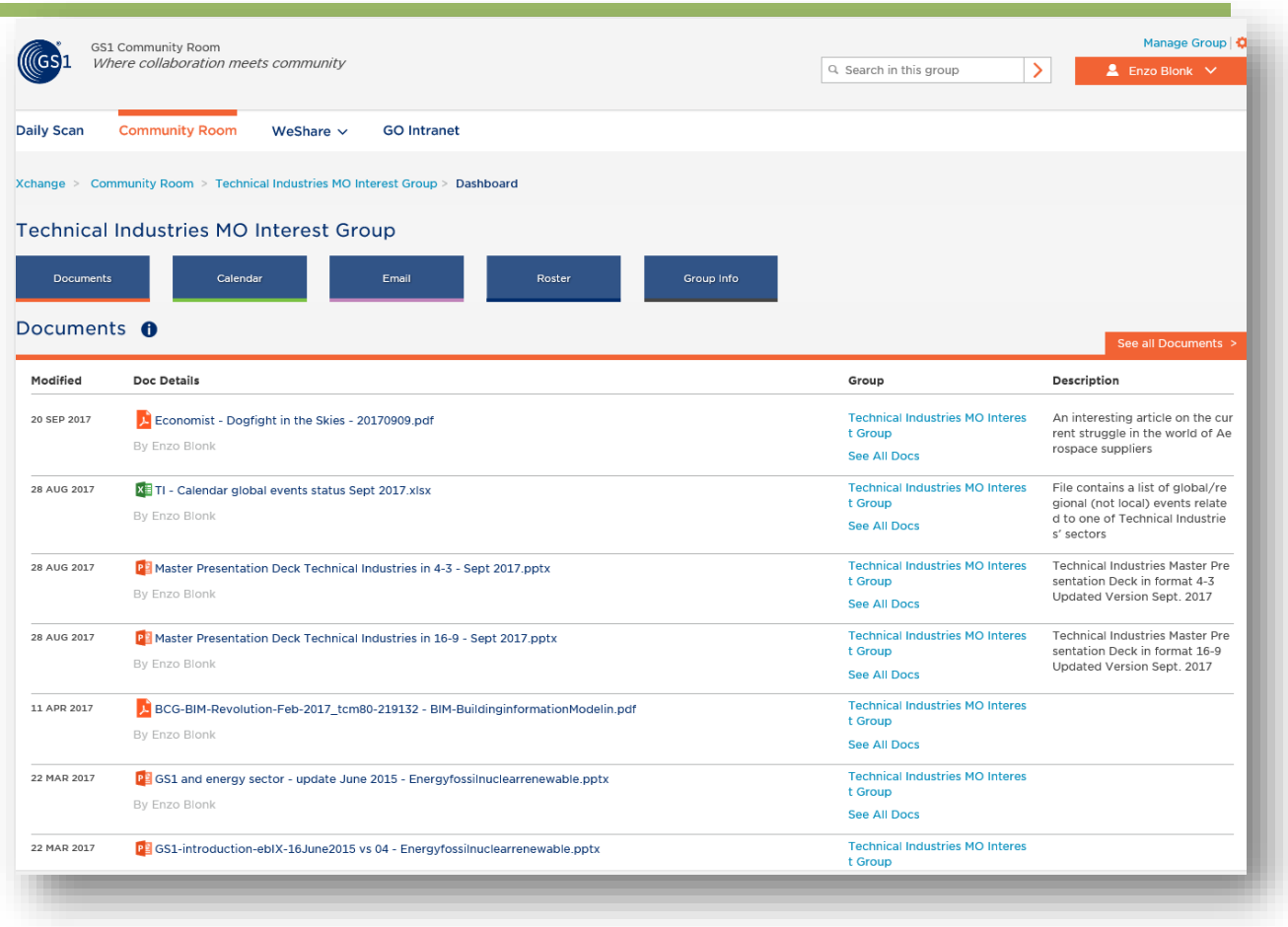

http://xchange.gs1.org/cr/ig/timoig

Before addressing the 3 other sectors in focus, what about…… CPG?

CPG

Who:

- End-users: Consumer Packaged Goods companies (production plant)
- Suppliers: Part and components manufacturers (OES/OEM), Technology providers

Challenges:

- Low quality copies of safety-relevant spare parts
- Low inventory visibility due to use of multiple identification systems (suppliers)
- How to engage in Smart Manufacturing strategies?
- Machine-to-machine automated communication across companies (end-user/suppliers)
- Production downtimes due to lack of parts inventory visibility and performance monitoring

Specific benefits:

- Unique and global identification of (original) spare parts (predictive replenishment)
- Efficient performance monitoring and preventative maintenance through continuous online measurements and automated analysis.
- Traceability of entire product lifecycle (efficient supplier recall of products)
- Scalability of solutions, efficient sharing of product (master) data
- *Future factory* operation visibility

CPG…all about Item visibility & Data Quality

- Global **food**, health and well-being company (Forbes Top 50)
- 418 factories in 86 countries
- Uses GS1 standards for consumer products (retail) since the start (40y)
- Factory inventory (machine engineering) : on average 3000 spare parts from 300 suppliers

Impact identification

- 300 suppliers = 300 different proprietary identification systems !!
- Each part, at receipt, entered individually in ERP with a "material/article number" with non-existing, incomplete or erroneous master data
- Each factory has its own ERP → no "cross-factory" visibility
- Additional complexity :
  - Frequently changed part numbers
  - Lack of structured master data

Case 2 : Item visibility & Data Quality

- Global **food** ompany (Forbes Top 50)
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- Uses GS1 st oducts (retail) since the start
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Impact ide

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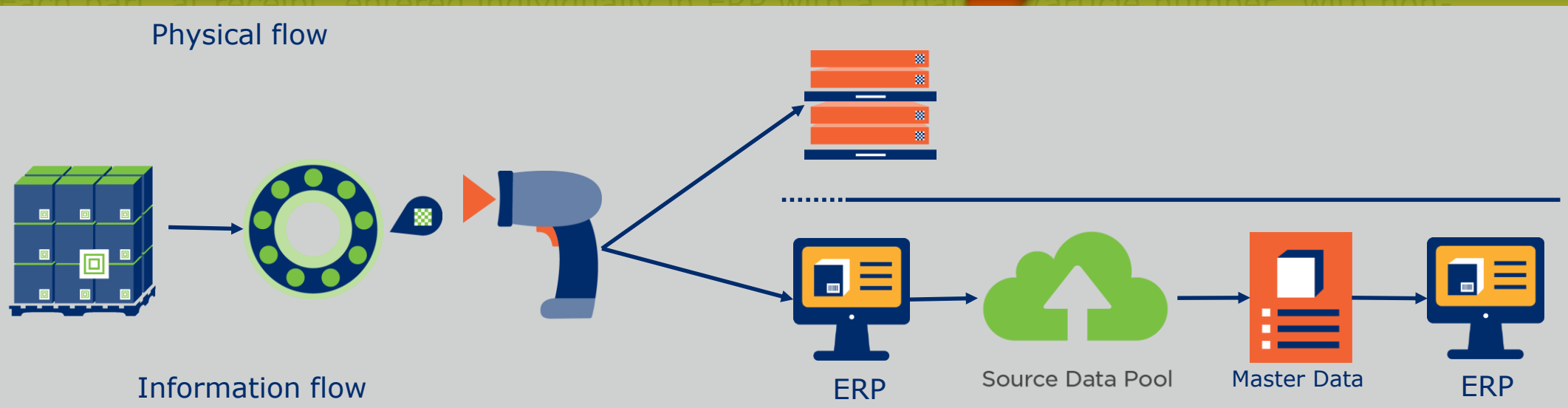


Next Steps

- Launch a small CPG Technical Industries work group.

- Deliverables :

Phase 1

- Work together to develop draft recommendation on
  - Definition of Unique Identifier Rules
  - Definition of standard list of Attributes

Phase 2

- Launch a small scale pilot for exchange of Material master data

Phase 3

- Engage in GSMP (*Global Standards Management Process*) to create global standards

3. Construction

Construction

Who:

- End-users: Public Authorities, Facility Management, Construction engineers, architects
- Suppliers: Parts/components, tools, machine manufacturers, Contractors/Subcontractors

Challenges:

- Correct and consolidated deliveries of materials and tools to correct site/address on time
- Authentication of correct materials/suppliers and visibility on-site and upstream
- **BIM (Building Information Modelling)** doesn't automatically result in savings and increased quality
- To make contractual agreements on format – IFC (Industry Foundation Classes)

Specific benefits:

- Unique and global identification of (original) spare parts for predictive replenishment and of BIM objects with the corresponding manufacturer
- Optimised asset utilisation through efficient condition monitoring and preventative maintenance
- Increased revenue/reduced cost through uninterrupted operations
- Reduced business risk through increased safety and product/asset/tool traceability
- GS1 Standards fits perfect to the requirements of IFC

- What is BIM ?
- Who is buildingSmart International ?
- Guest Speaker Inge Aarseth, Vestfold Hospital Trust

What is BIM ?

Video : https://youtu.be/QElAdXH_rQU (courtesy of Dewberry.com)

BIM (Building Information Modelling)….

- …is a **digital representation** of physical and functional characteristics of a facility.

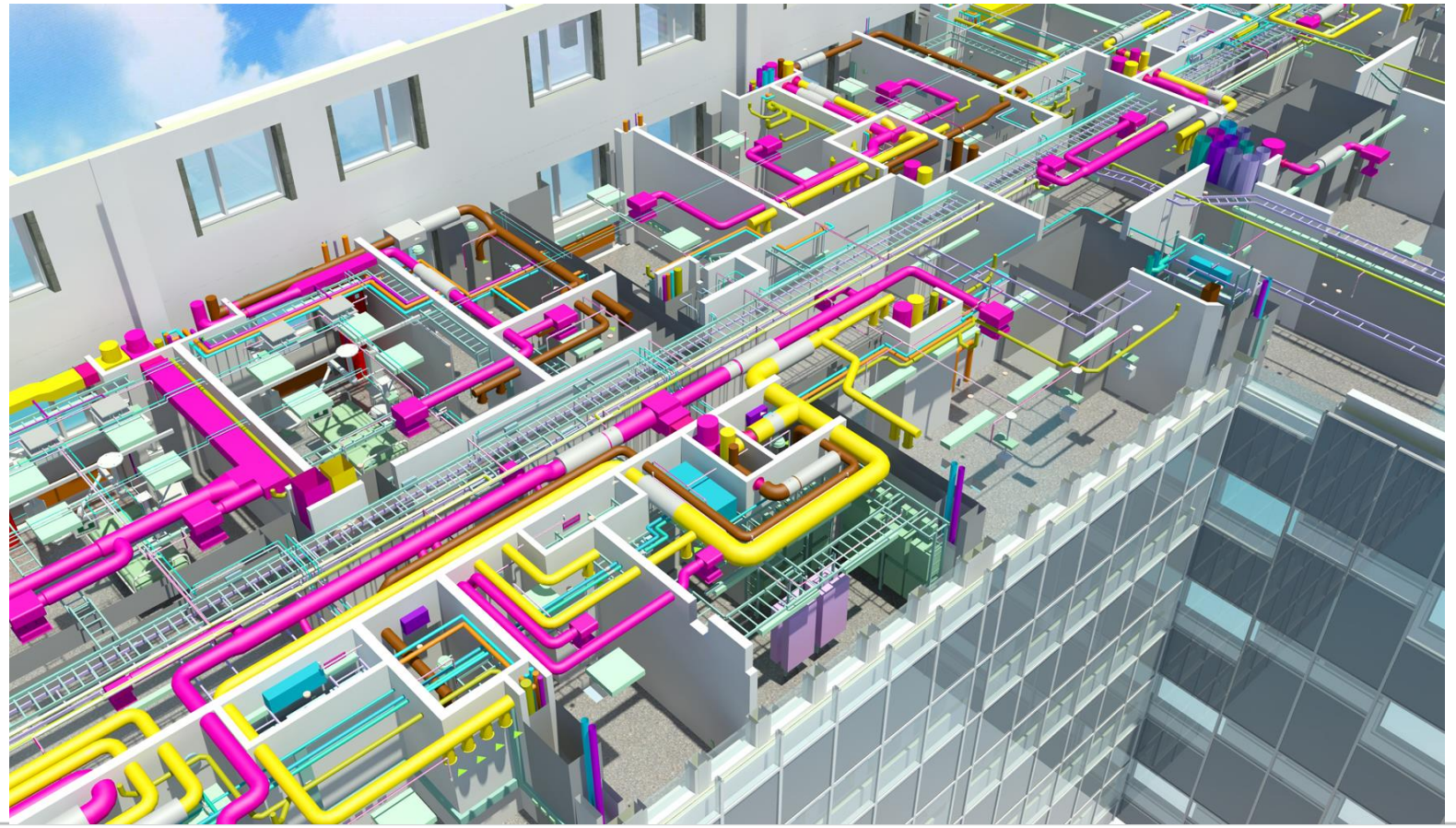


Image courtesy of bimcrunch

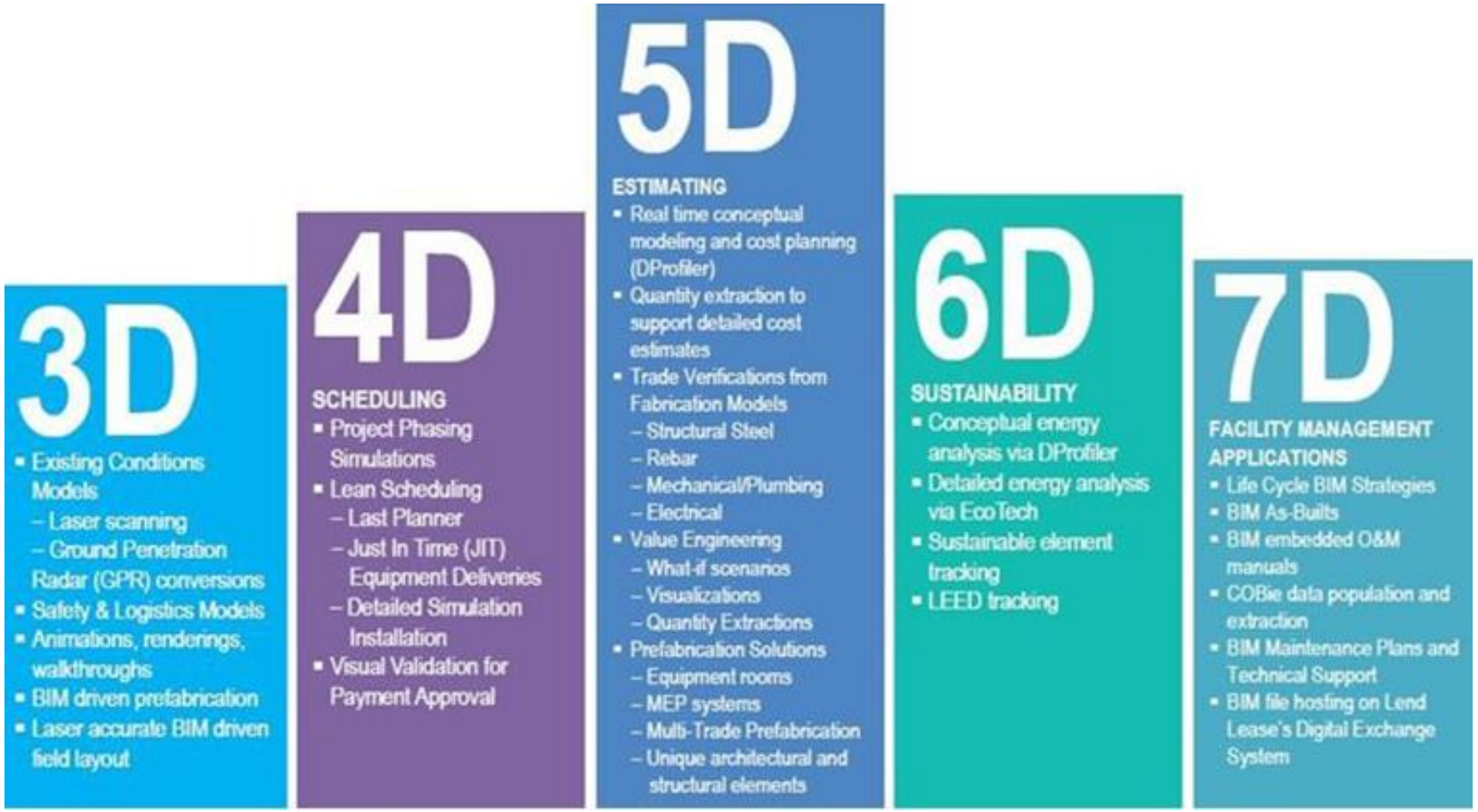
[1] NBIMS-US, 2016
[2] Eastman, 2009

BIM (Building Information Modelling)….

- …is a **digital representation** of physical and functional characteristics of a facility.
- …is a **shared knowledge resource for information** about a facility forming a reliable basis for decisions during its life-cycle; defined as existing from earliest conception to demolition [1].
- …covers **more than just geometry** — it covers "spatial relationships, light analysis, geographic information, and quantities and properties of building components" [2].
- …is representing **a design as combinations of "objects"** — vague and undefined, generic or product-specific, solid shapes or void-space oriented (like the shape of a room), that carry their geometry, relations and attributes [2]. Objects are also defined as parameters and relations to other objects[2].
  - Each element of a building model can carry attributes to automatically select and order them where cost estimates and material tracking and ordering can be provided [2].

[1] NBIMS-US, 2016
[2] Eastman, 2009

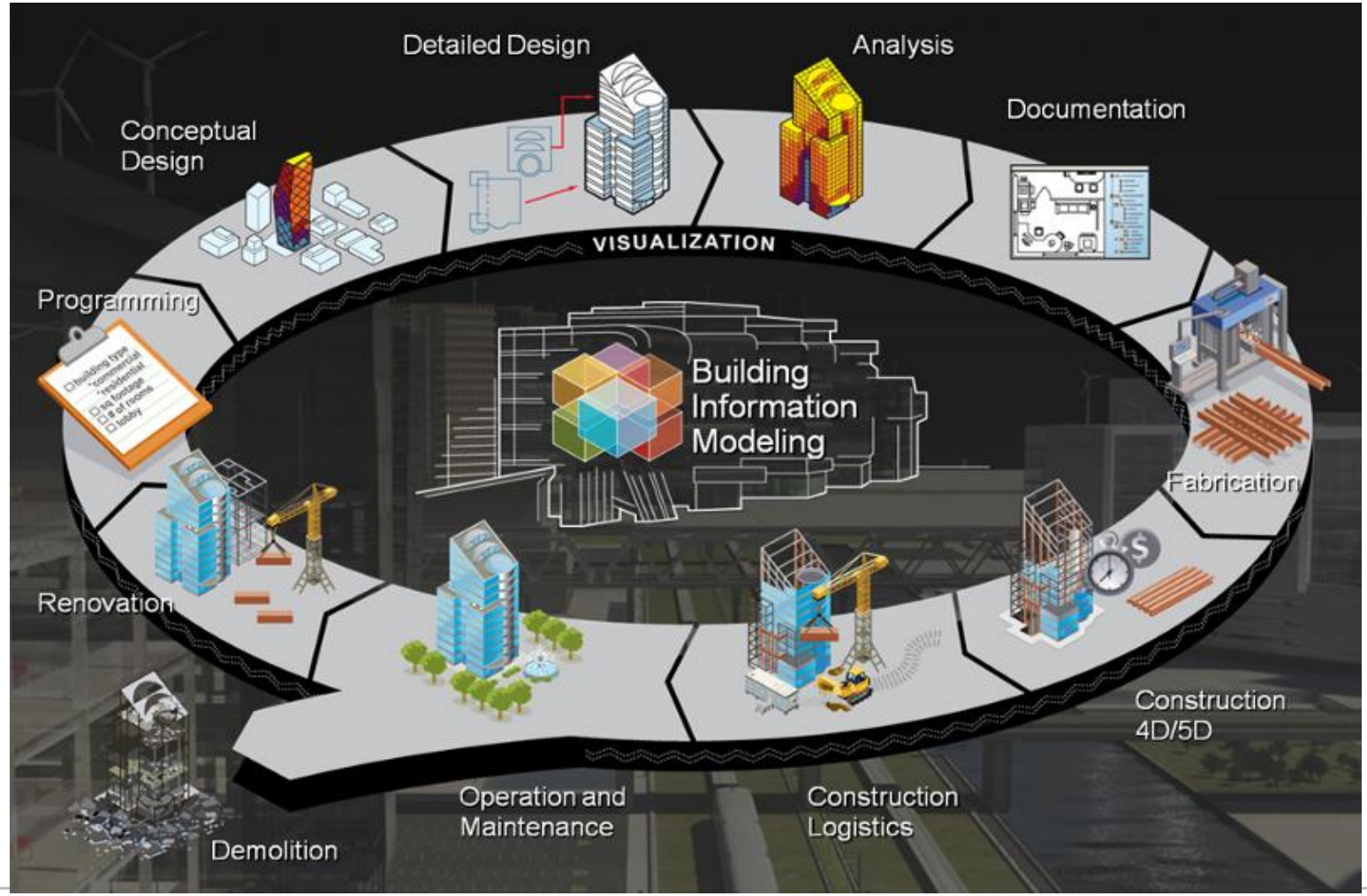
BIM – Processes and Depth



The various subsets of BIM are described in terms of dimensions — 3D (object model), 4D (time), 5D (cost), 6D (operation), 7D (sustainability), and even 8D (safety) (Smith, 2014).

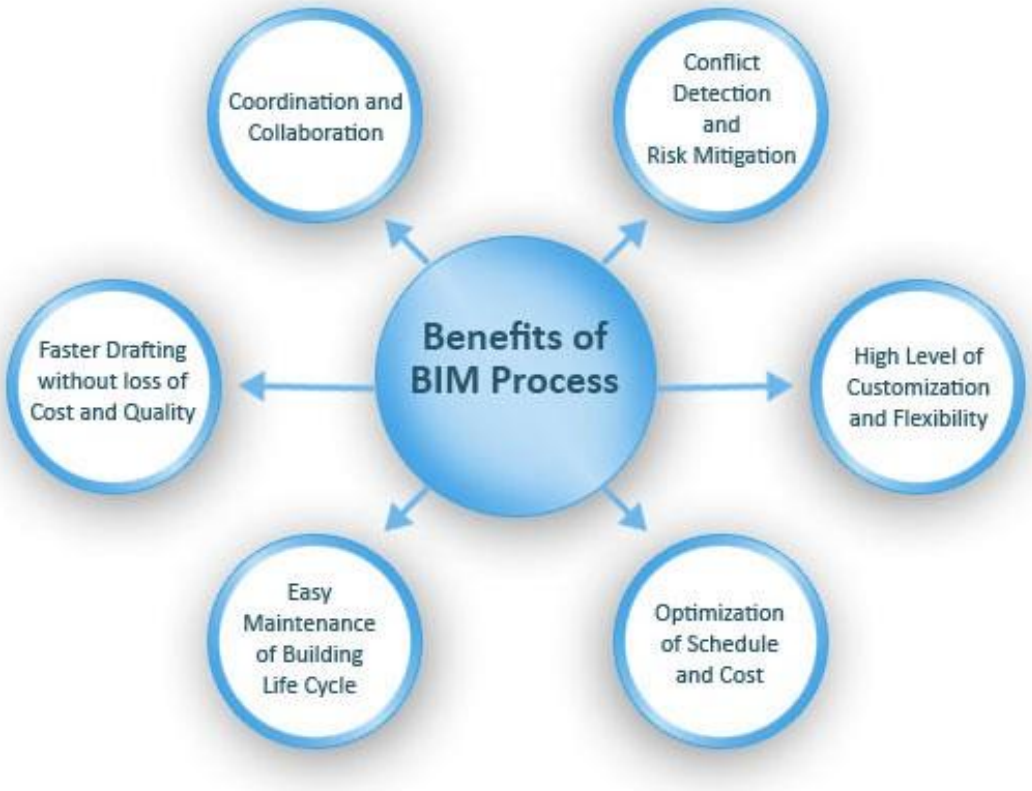
Images courtesy of AproPlan

BIM – Processes and Depth



Images courtesy of AproPlan

BIM benefits



Lower costs

33%

reduction in the initial cost of construction and the whole life cost of built assets

Faster delivery

50%

reduction in overall time, from inception to completion, for newbuild and refurbished assets

Lower emissions

50%

reduction in greenhouse gas emissions in the built environment

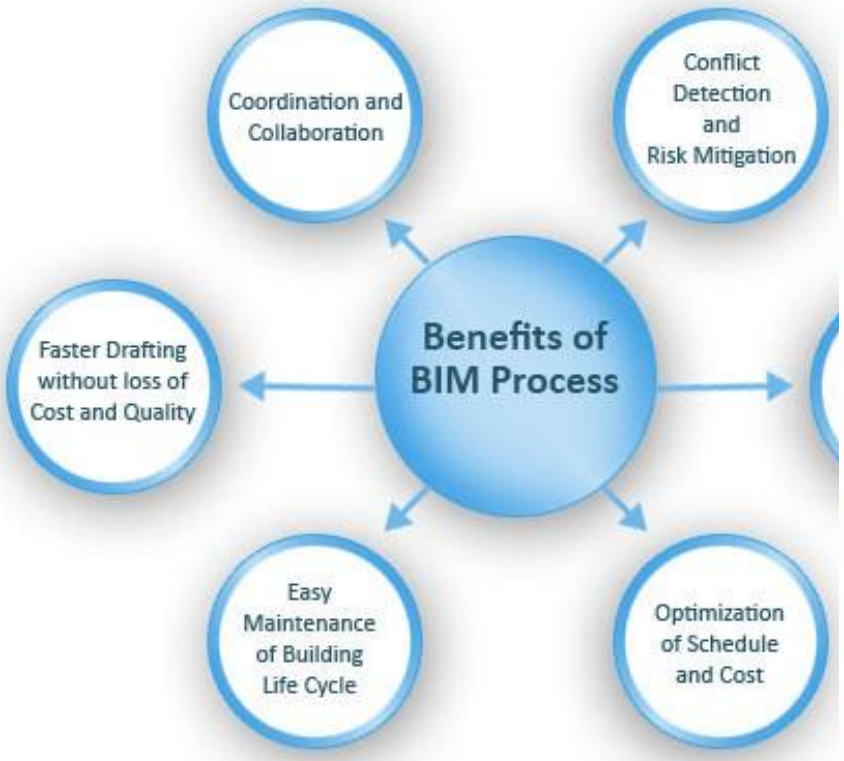
Improvements In exports

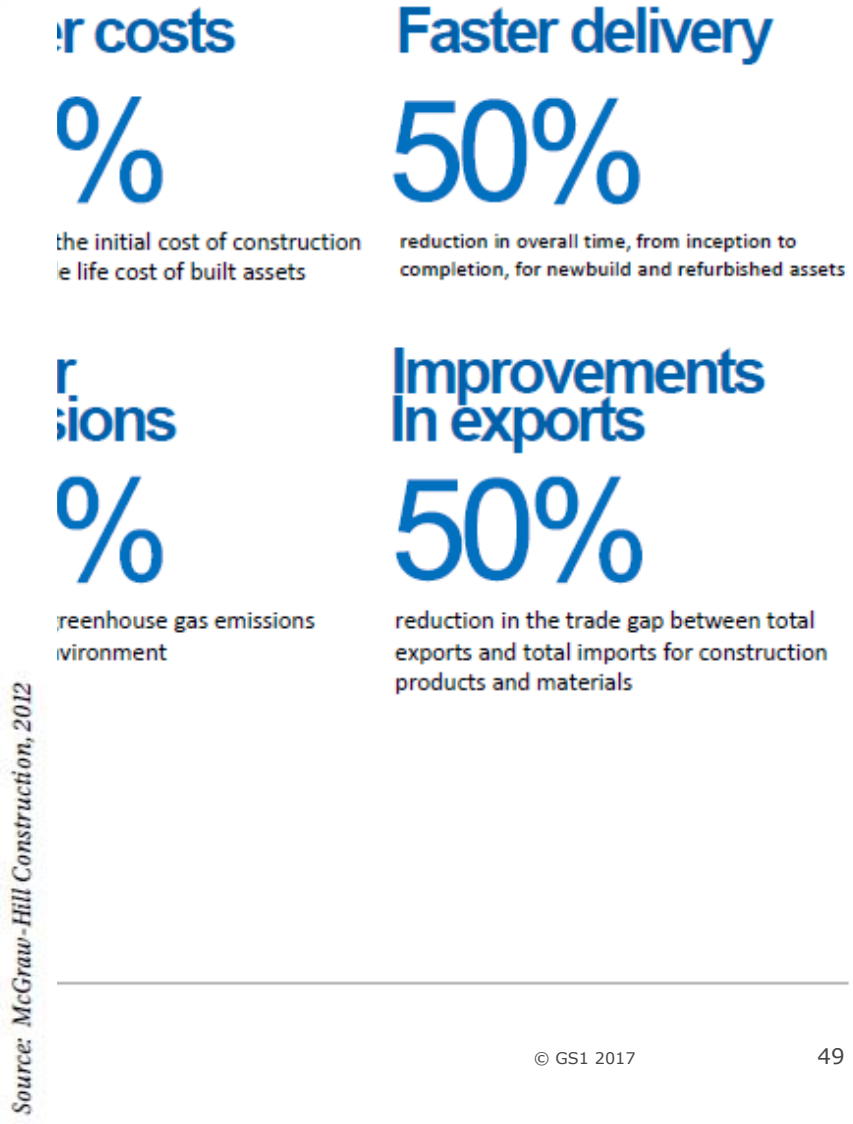
50%

reduction in the trade gap between total exports and total imports for construction products and materials

Images & figures courtesy of AproPlan

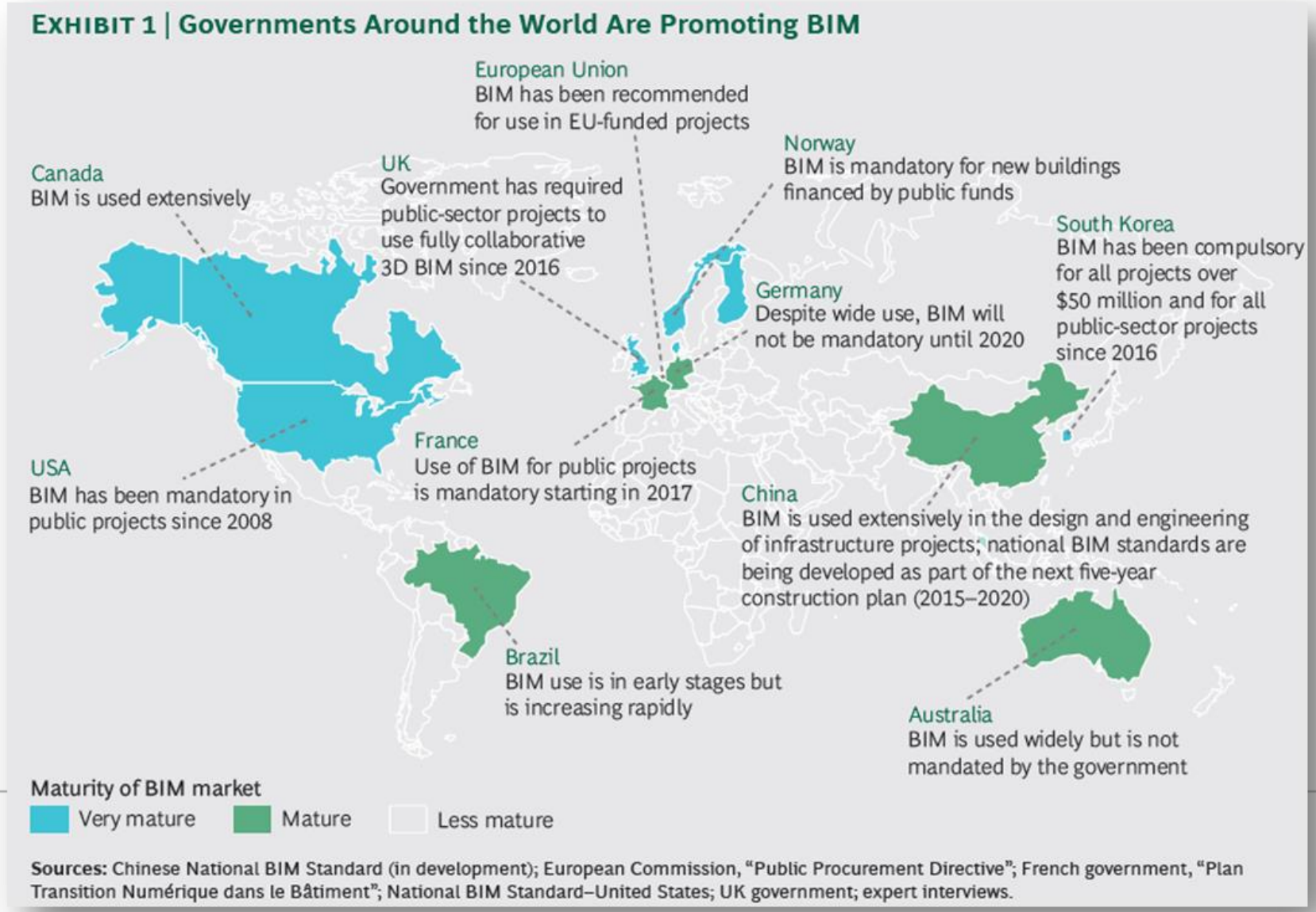
BIM benefits





Images & figures courtesy of AproPlan

How is BIM “promoted” worldwide ?



Who is buildingSmart International?

- buildingSMART is the worldwide authority driving the transformation of the built asset economy through creation & adoption of open, international standards
  - Processes
  - Workflows
  - Procedures
- Started in 1994 (International Alliance for Interoperability)
- International office in London UK
- 18 chapters world-wide
- Sponsored by stakeholders and technology providers

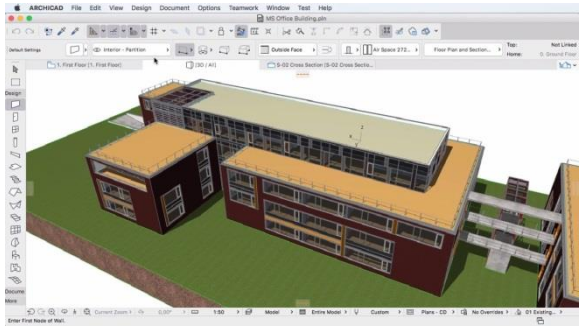
- http://www.buildingsmart.org/
- https://youtu.be/2m_IL99WOzQ

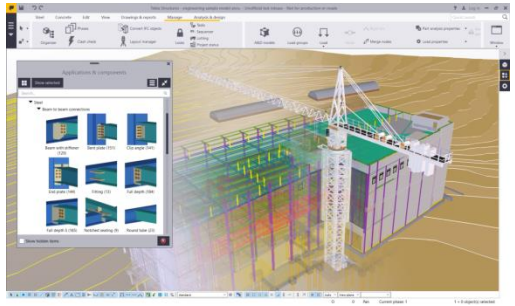
buildingSMART® International home of openBIM

Selected buildingSMART Standards

IFC

- **I**ndustry **F**oundation **C**lasses
- The "PDF" of BIM
- Enables data exchange and collaboration between different softwares/models
- Can be viewed in free viewers
- Used for quantity take-off (listing)





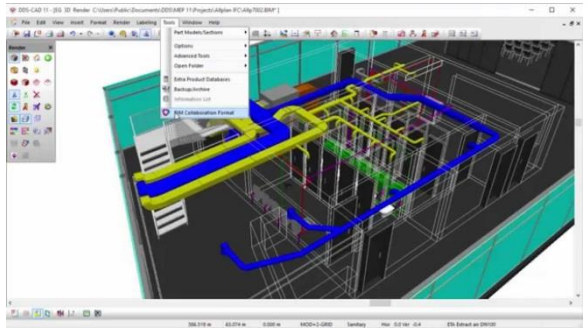
BCF

- **B**IM **C**ollaboration **F**ormat
- A "chat" within BIM

TM

bSDD

- **b**uilding**S**MART **D**ata **D**ictionary
- Connects/translates data
- Makes BIM understandable across countries/languages/codes/softwares, etc..



GS1 and buildingSMART collaboration

Adoption of GS1 standards can improve several buildingSMART standards

There is a common interest in collaboration and a MOU is under development

- GS1 Norway became member of BS Norway October 2016
- GS1 Norway in the program committee of the bS Norway Conference May 2017
- GS1 invited to bS executive board meeting in Zürich spring 2017
- GS1 and bS meeting in London August 2017
- GS1 and bS Japan meeting October 2017
- GS1 and bS Norway workshop October 2017 (standards mapping)
- GS1 invited to bS Summit in London November 2017

Inge Aarseth

The Tonsberg Project

Digitalisation of building components and systems

4. Defence

Defence Logistics….vision & reality ?

Video : https://youtu.be/DYA9_HvgJcw (courtesy of LogNet Global)

Defence

Who:

- End-users: National Armed Forces, NATO, NCB (National Codification Bureaus).
- Suppliers: Parts and component manufacturers (OES/OEM) in Mass Transit, Engineering,...

Challenges:

- Category ID ("Same Form/Fit/Function") vs. unique product identification (higher granularity)
- Complex, discontinuous communication channels with suppliers (frequently modified part numbers w/o customer notification and erroneous shipments)
- Shrinking defence budgets

Specific benefits:

- More efficient internal logistics through unique equipment identification
- Smoother relationships/communication with all suppliers
- Linking NCS (NATO Codification System) with global data pools, such as under GDSN
- Interoperable logistics during joint (peace-keeping) field operations
- Tele-maintenance of offshore installations including vessels, field hospitals, etc…
- Foundation for service-based revenue models

GS1 references in Defence

In NATO Standards Documents :

- STANAG 2495 AST (Edition 2) – Data Formats for Asset Tracking, (June 2004)
- STANAG 4281 AST (Edition 2) NATO Standard Marking for Shipment and Storage (Nov 2009)
- the NATO Guidance on Unique ID Items (July 2010)
- STANAG 4329 AST (Edition 4) - NATO Standard Bar Code Symbologies AAP-44(A) (Sept. 2010)
- STANAG 2233 AST (Edition 3) - NATO Consignment and Asset Tracking by Radio-Frequency Identification (Nov. 2010)
- STANAG 2290 AST (Edition 2) - NATO Unique Identification of Items (Nov. 2010)
- STANAG 2494 (Edition 4) - NATO Asset Tracking Shipping Label and Associated Symbologies (Oct. 2012)
- NATO Manual on codification (Jan. 2014)
- STANAG 3151 (Edition 10) – Codification – Uniform System of Item Identification (July 2015)

In National Armed Forces Documents :

- Germany : *TL A-0032 - Technical General Specifications (effective Aug. 23rd, 2013)*
- Poland : *DECYZJI Nr 3/MON MINISTRA OBRONY NARODOWEJ z dnia 3 stycznia 2014 r (effective July 1st, 2014)*
- Spain : GS1 XML messaging (EDI) for consumer goods as a requirement for public tenders.

GS1 references in Defence

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- STANAG 2495 AST (Edition 2) – Data Formats for Asset Tracking, (June 2004)
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- the NATO Guidance on Unique ID Items (July 2010)
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- STANAG 2233 AST (Edition 3) - NATO Consignment and Asset Tracking using Radio Frequency Identification (Nov. 2010)
- STANAG 2290 AST (Edition 2) - NATO Unique Identification [illegible] (Nov. 2010)
- STANAG 2494 (Edition 4) - NATO Asset Tracking Shipping Label and Associated Symbology (Oct. 2012)
- NATO Manual on codification (Jan. 2014)
- STANAG 3151 (Edition 3) – Codification – Uniform System of Item Identification (July 2015)

In National Armed Forces Documents :

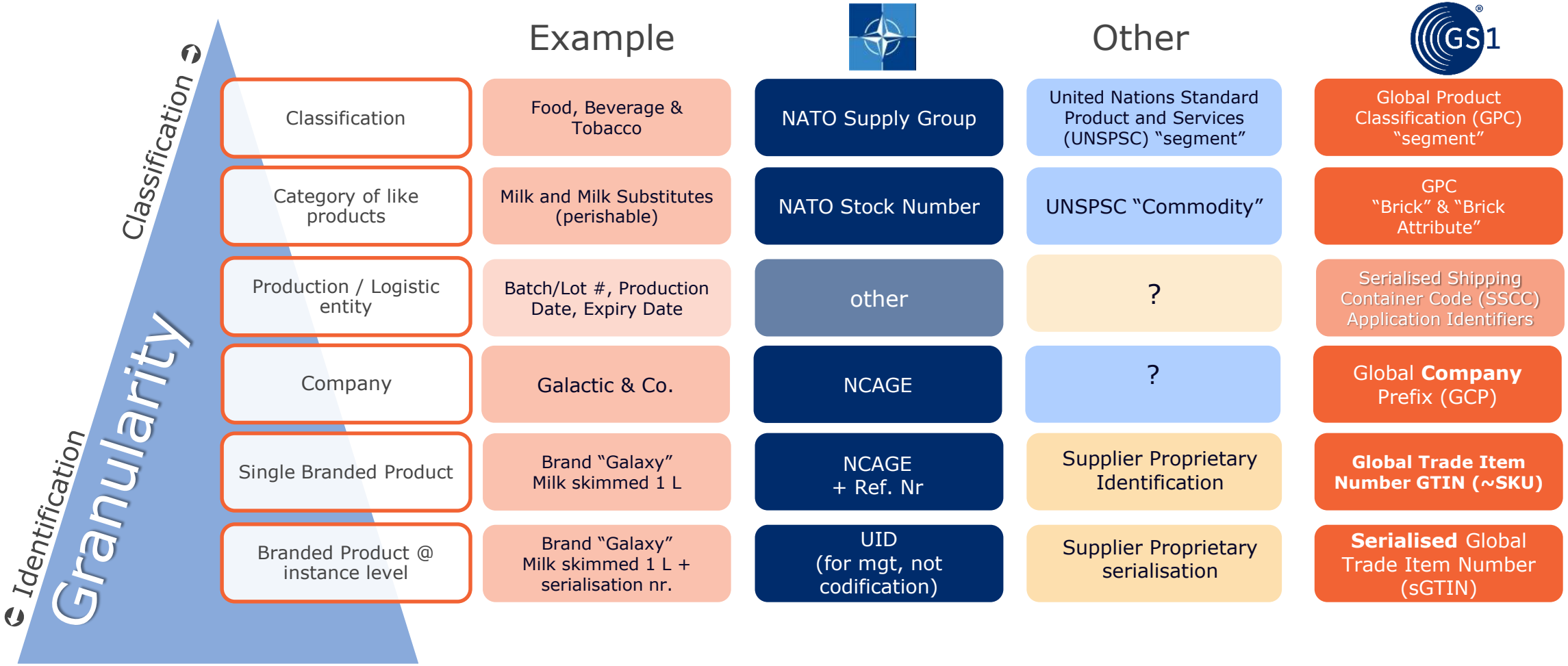
- Germany : *TL A 0052 - Technical General Specifications (effective Aug. 23rd, 2013)*
- Poland : *DECYZJI Nr 3/MON MINISTRA OBRONY NARODOWEJ z dnia 3 stycznia 2014 r (effective July 1st, 2014)*
- Spain : GS1 XML messaging (EDI) for consumer goods as a requirement for public tenders.

NSA & GS1 signed a TCA in January 2006

Thierry Vanden Dries

Levels of Product Identification

GTIN and NSN Relationship



	Example		Other	GS1
Classification	Food, Beverage & Tobacco	NATO Supply Group	United Nations Standard Product and Services (UNSPSC) "segment"	Global Product Classification (GPC) "segment"
Category of like products	Milk and Milk Substitutes (perishable)	NATO Stock Number	UNSPSC "Commodity"	GPC "Brick" & "Brick Attribute"
Production / Logistic entity	Batch/Lot #, Production Date, Expiry Date	other	?	Serialised Shipping Container Code (SSCC) Application Identifiers
Company	Galactic & Co.	NCAGE	?	Global **Company** Prefix (GCP)
Single Branded Product	Brand "Galaxy" Milk skimmed 1 L	NCAGE + Ref. Nr	Supplier Proprietary Identification	**Global Trade Item Number GTIN (~SKU)**
Branded Product @ instance level	Brand "Galaxy" Milk skimmed 1 L + serialisation nr.	UID (for mgt, not codification)	Supplier Proprietary serialisation	**Serialised** Global Trade Item Number (sGTIN)

More granularity = increased traceability

NATO World Codification Forum – Melbourne May 2017

NATO World Codification Forum – Melbourne May 2017

WCF : GS1 workshop - objective

- Develop a **Briefing paper** (for NATO, Australia DoD and beyond)
- Describing the **opportunities** and **challenges** in Defence Departments **adopting Global** Industry Data and Supply Chain **Standards** for :
  - Unique (Product) **Identification**,
  - Data **Capture** (Barcodes and RFID), and
  - Data **Sharing** (Item Master Data, Transactional Data, Event Data)
- Based on workshop participant **feedback**

WCF : GS1 workshop – format (1)

Series of introduction presentations on each of the key topics :

- Presentation on use of GS1 Standards for Identification of products, locations, shipments and assets and related data capture standards for barcodes and RFID technologies, incl. description of complimentary relationship between the GTIN and the NSN.

- Presentation on GS1 Data Sharing standards incl. 3 key data sharing functions supported using GS1 Standards
  - Item Master Data Sharing,
  - Transactional Data Exchange,
  - Event Data Sharing

- Presentation from a guest speaker from Schaeffler Australia Ltd. : case study on GS1 Standards in Action

WCF : GS1 workshop – format (2)

- Attendees broken into 4 groups

- Asked to discuss the challenges and opportunities for the Defence sector in their countries to leverage GS1 Data and Supply Chain Standards.

- Topics identified were:
  - Leveraging the GS1 GDSN for sharing Item Master Data with suppliers
  - Using GS1 Standards for Traceability and Anti-Counterfeiting
  - The role of GS1 Standards in Inventory Management and Logistics; and
  - Improving Maintenance, Repairs and Overhaul processes via GS1 Standards

WCF : Group 1– GS1 GDSN and Item Master Data Sharing

Key issues

- Ensure supplier shares item master data and updates/changes (IP !)
- Large duplication of NSN : GTIN provided by supplier could support (x-ref)
- Buy-in suppliers for NSN (lack of understanding on “controls” use of NSN)
- Managing product substitution (same form, fit, function ?)

Adoption GDSN

- Not every NSN has a GTIN and v.v. → linking data difficult
- GDSN contains mainly CPG, not yet fully developed for more technical products
- Mapping use cases supported by both NSN and GTIN is necessary

Recommendation

- Provision of GTIN as part of codification process (mandatory requirement to include GTIN for new items)
- Launch workshop to define process linking GDSN and NCS data (GS1 & AC/135)
- Documenting complementary relationship GTIN & NSN (addressing concerns of duplicity)

WCF : Group 2– GS1 in traceability and anti-counterfeits

Are these key issues ?

1. Item authentication – is the product genuine?
2. Accessing History of an item / Chain of Custody?
3. Managing Certification and Compliance Data?
4. Product Recall?
5. Risk Management?

- Comment : in which phase of the supply chain do these occur ? Various levels of criticality (QC)
- Points 1,2 & 3 are paramount, points 4 & 5 are a consequence of 1,2 & 3 → all equal, address jointly.

Standards' adoption challenges (very labour-intensive and error-prone) :

- Corporate IT systems & integration
- Government budget constraints
- Stakeholder understanding of the meaning of "Industry Standards".
- Lack of scanning possibilities (processes still based on physical/manual effort).

Recommendation

- Today : *Strict receipt QA inspections / ERP-maintenance / Procurement limited to approved suppliers/OEM*
- Tomorrow (with GS1 standards) : Procurement (e-business) / Goods receipt / MRO (single cloud data)

WCF : Group 3– GS1 Standards role in Inventory & Logistics

Key issues

- Inventory accuracy (discrepancies, part number changes, , manual goods receipt processes
- Lack **volumetric data**, object configuration data, cert. of conformance, unclear units of measure,
- Lack of **systems interoperability**, leading to lack of **traceability**, manual reverse logistics process
- Time-consuming manual quality inspections

Adoption challenges

- Legacy system restrictions
- Too many silos working alongside each other (agreeing on standards and agreeing on source of truth from data perspective)

Recommendation

- GS1 member check (Gepir)
- Investigate using GS1 standards to bring consistency of data and information across the business and across systems

WCF : Group 4– GS1 Standards role in MRO

Key issues :

- Life Cycle Management (use beyond life cycle requirement, too large stocks, urgent grey market procurement)
- Maintenance history (data recorded in silos – no systems integration, no data transfer systems, info passed on from silo to silo via data dumps)
- Warranty mgt : non-existing (stock could fail within warranty period w/o knowing)

Adoption GDSN

- Lack of understanding how standards can help (time constraints)

Recommendation

- Ability to transfer data in efficient manner within a standard recognised by all systems.
  - Common understanding of base data required and option to obtain extra data based on req.
  - Identification needs to be paired with data alignment to support chain of custody.

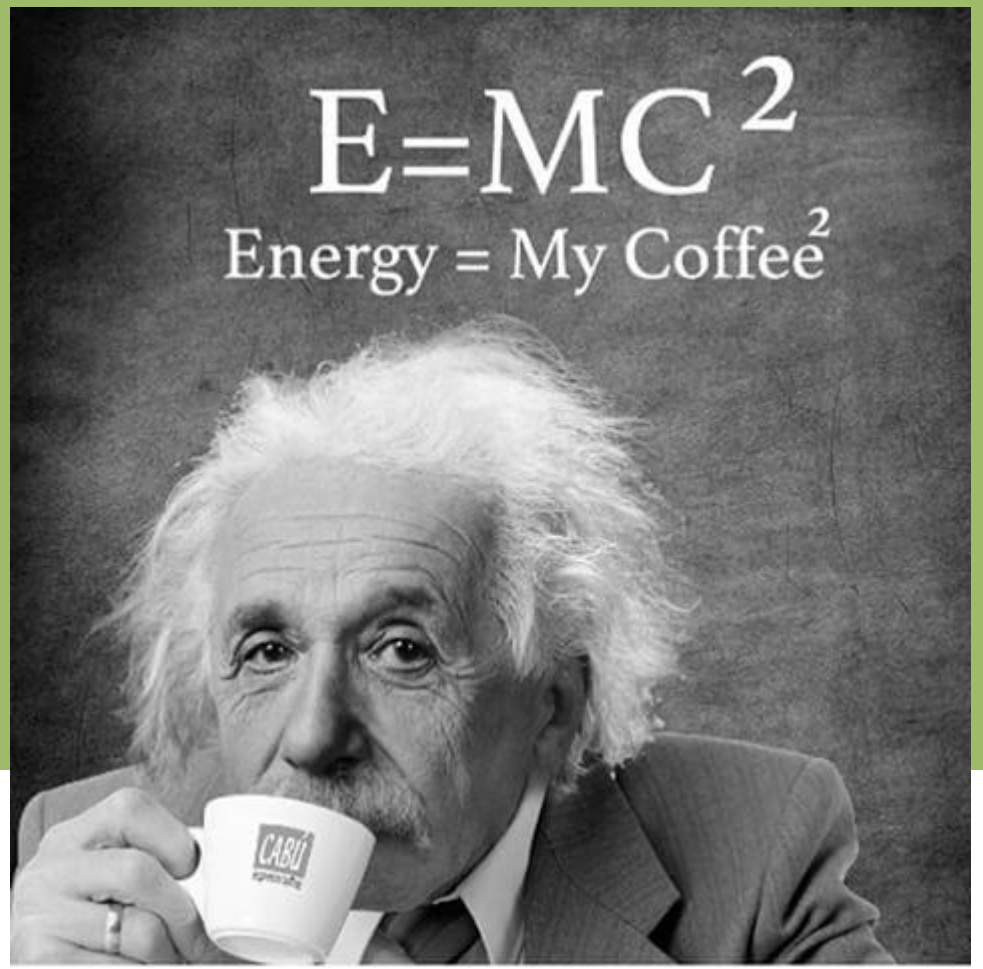
WCF : GS1 workshop recommendations

- Initial internal discussion/analysis at AC135 (core team) of the workshop findings.
- Meeting to be scheduled between Chairman AC-135 and GS1 Global Office in Brussels or Luxembourg in Q3 2017: purpose is to find ways of including use of GTINs in NCS without heavy investment in terms of IT
- Presentation / discussion at next AC-135 General Assembly in Q4 2017 in Luxembourg

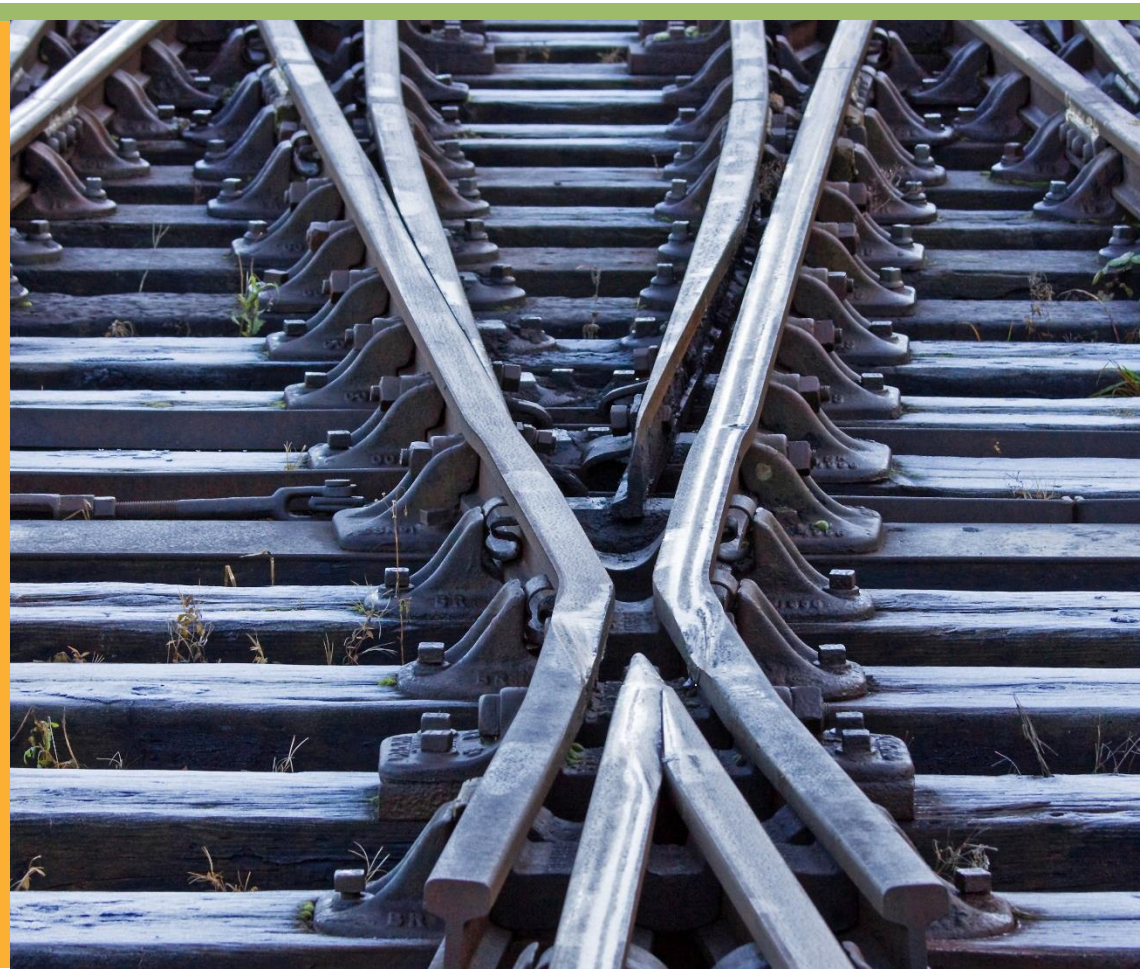
Next steps

- Raising community awareness :
  - GS1 GO←→MO and NATO AC-135 ←→ NCB
- Participate in work groups or steering committees
  - AC-327 : Data work group
- Launching specific task group
  - “How to marry NSN with GTIN v.v. and access Master Data”
  - Formal approval by AC-135 during GA mid-November 2017

Coffee / Tea / Hot Chocolate Break



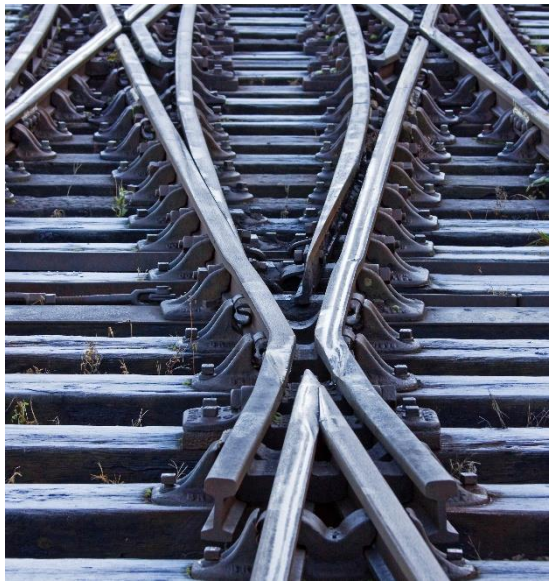
5. Railways



The Global Language of Business

Enabling the Digital Railway

Identification of components and parts in the railway industry



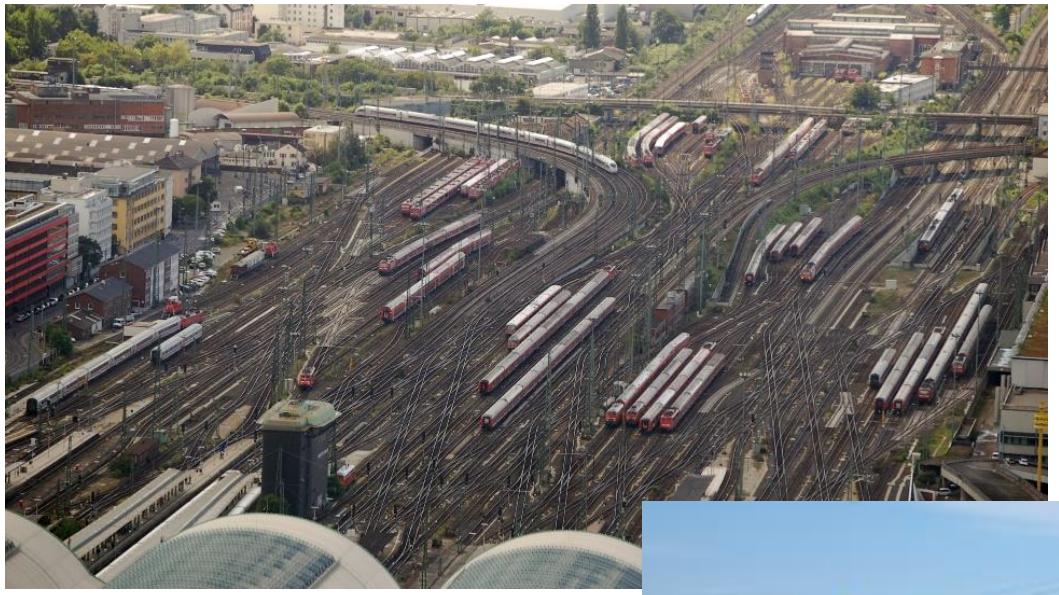
1. Introduction
2. Business needs
3. Rail Industry driven Vision
4. The Application Standard
5. Industry Perspectives
   - Case study SBB / Siemens
   - Case Study Deutsche Bahn
6. Why Implement ?
7. Next Steps

Q&A

1. Introduction

Rail – a complex environment

The railway industry manages ***Rolling Stock*** and ***Infrastructure***
and needs to ensure ***Interoperability***



Rail – a complex environment

TRACKS

TRAINS

TOOLS & EQUIPMENT

ELECTRONICS

SPECIALISED MACHINERY

NUTS & BOLTS

CHEMICALS

RETURNABLE ASSETS

BEVERAGES

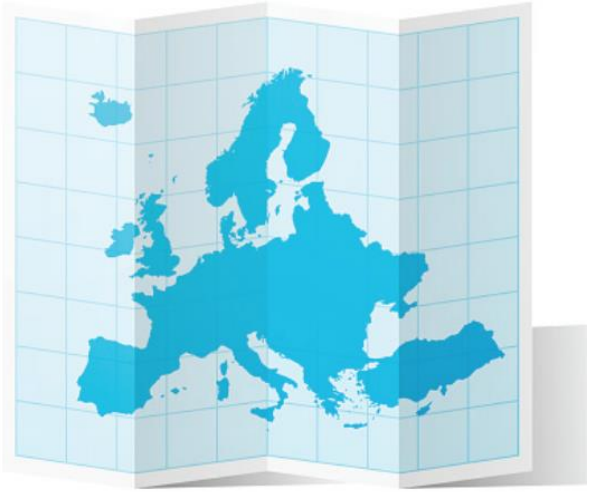
FOOD

Rail – a complex environment

And we must track and manage all of these things!

Rail – a complex environment

Furthermore, we often need to track & manage them ***across borders*** and in ***cooperation*** with other national/regional rail companies



DB

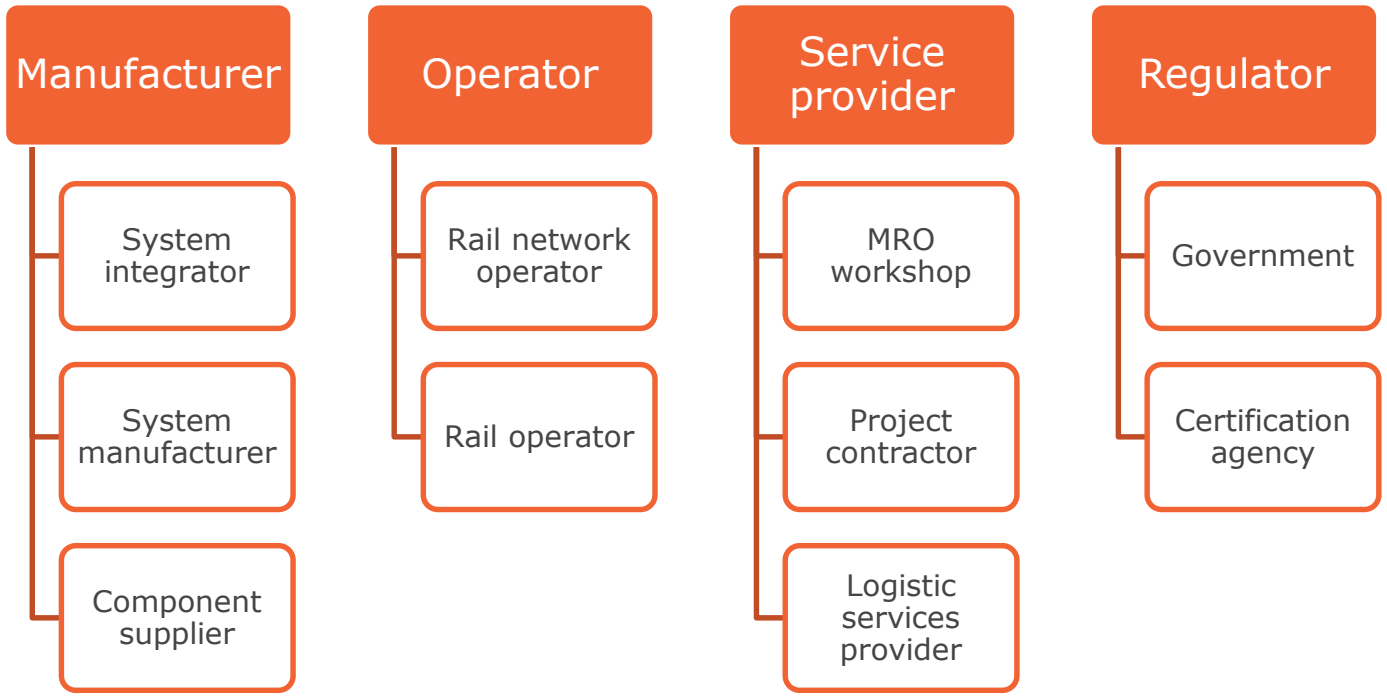
SNCF

SBB CFF FFS

2. Business Needs

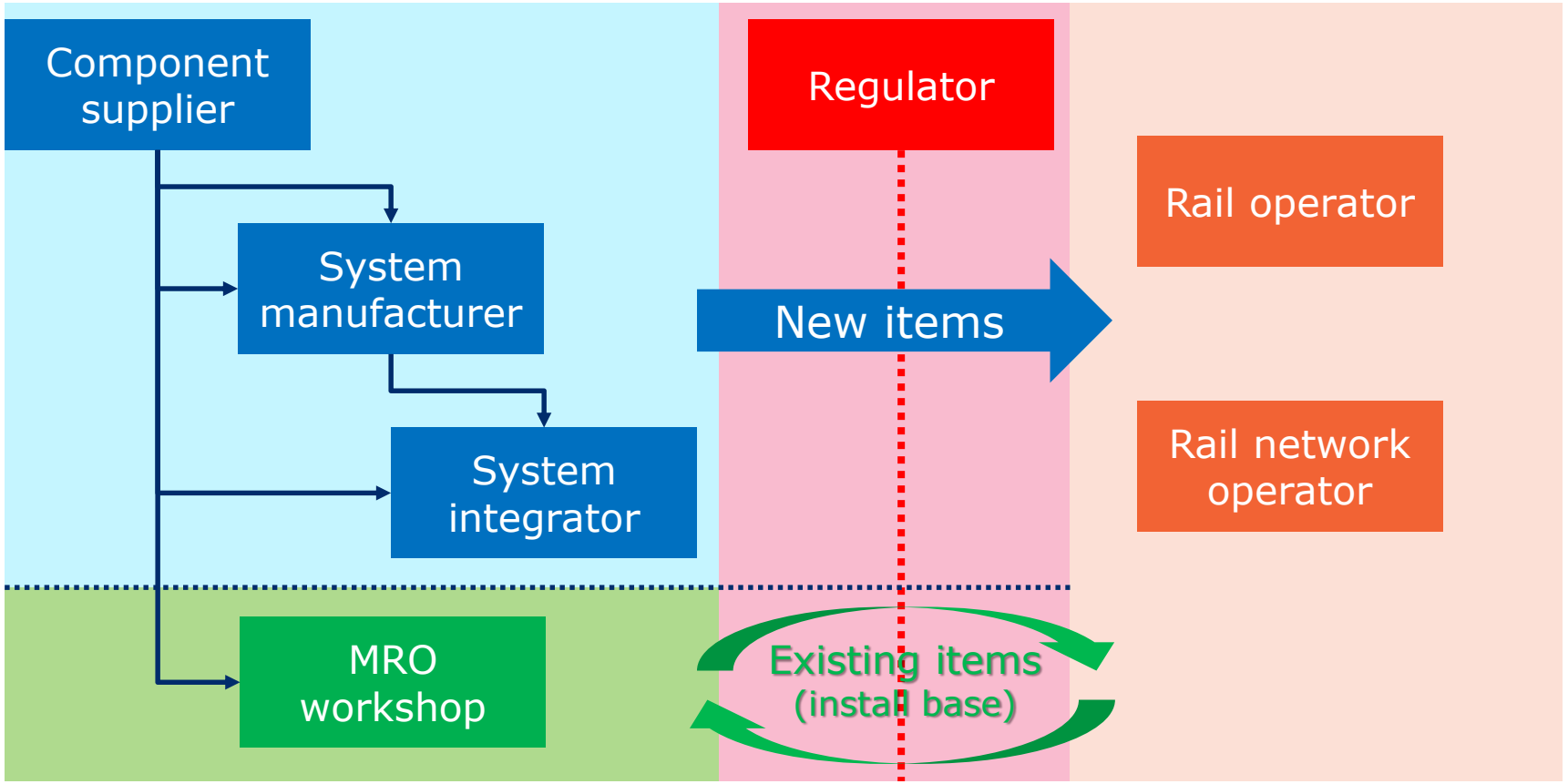
Business Needs

Rail Stakeholders and Business processes



Business Needs

Overview of the value chain



Business Needs

external influences on the Rail sector…

Legislation

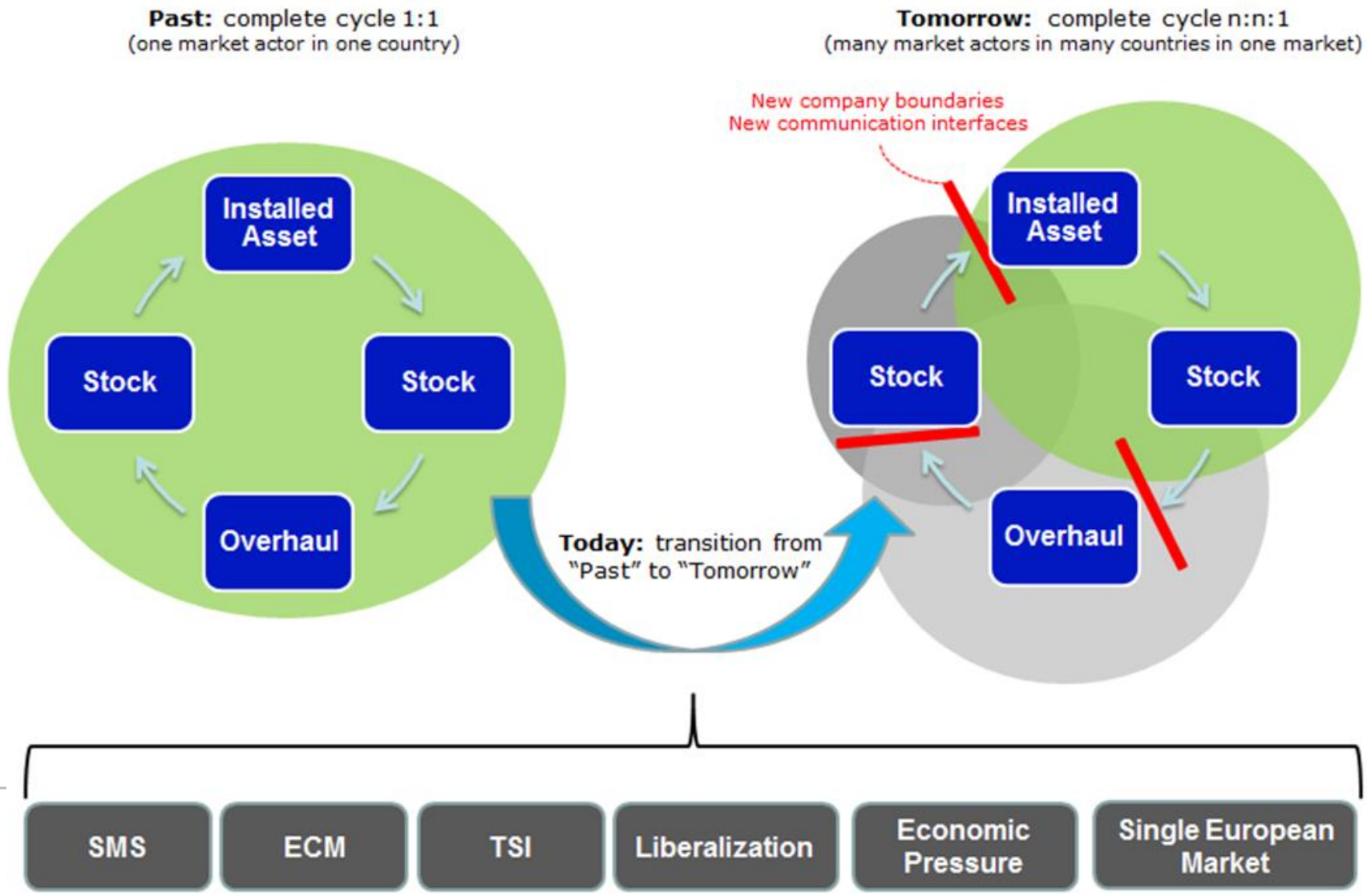
- SMS Operator EU 1158/2010
- ECM EU 445/2011
- SMS Infra EU 1169/2010
- TSI
- CE "Blue Guide"

Market Pressure

- Single European Market
- Cost Pressure
- Supply Chain Globalisation
- New Automotive Technologies
- Higher Reliability
- Improved Service

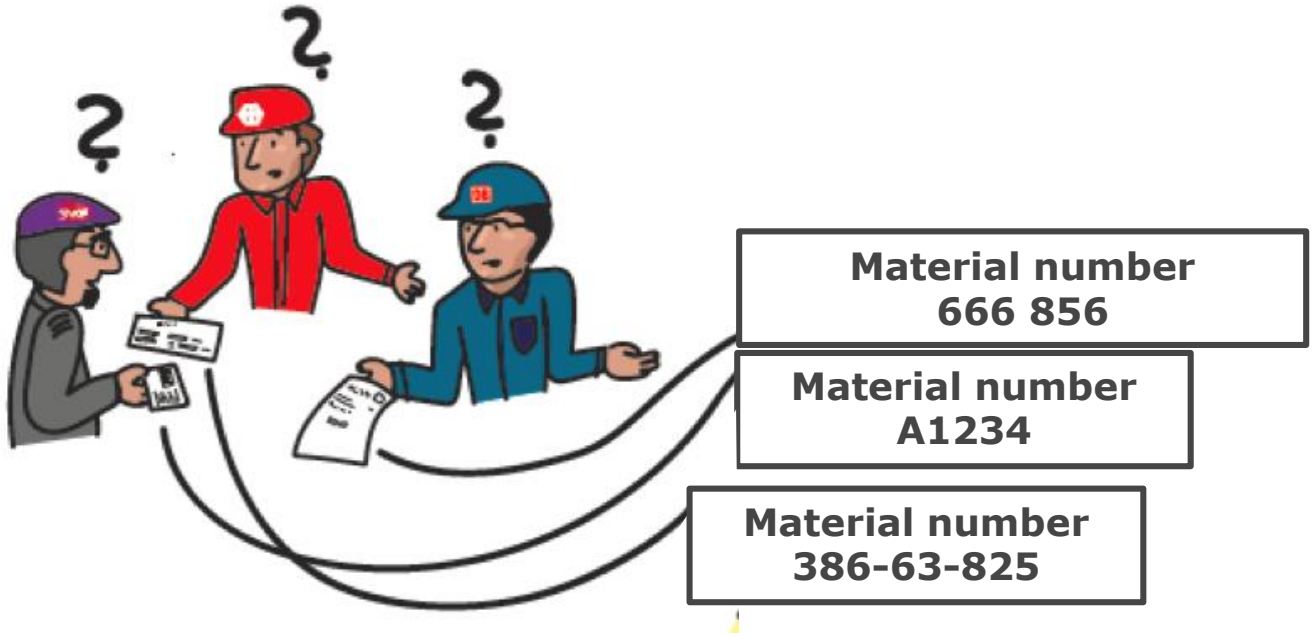
Business Needs

The Rail sector is in a state of transition



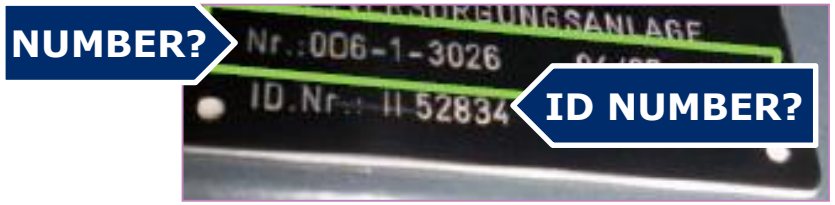
Operational Issues –

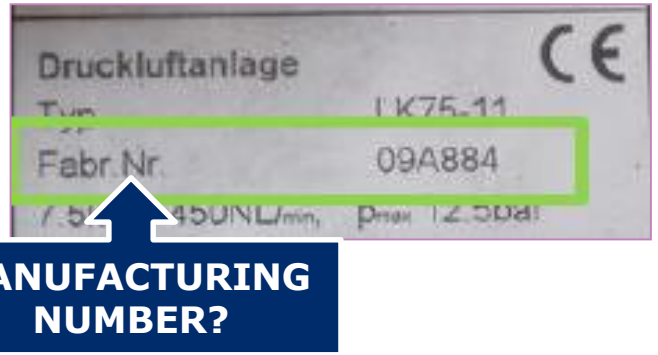
Are we talking about the same material?



Operational Issues –

Are we talking about the same single item?

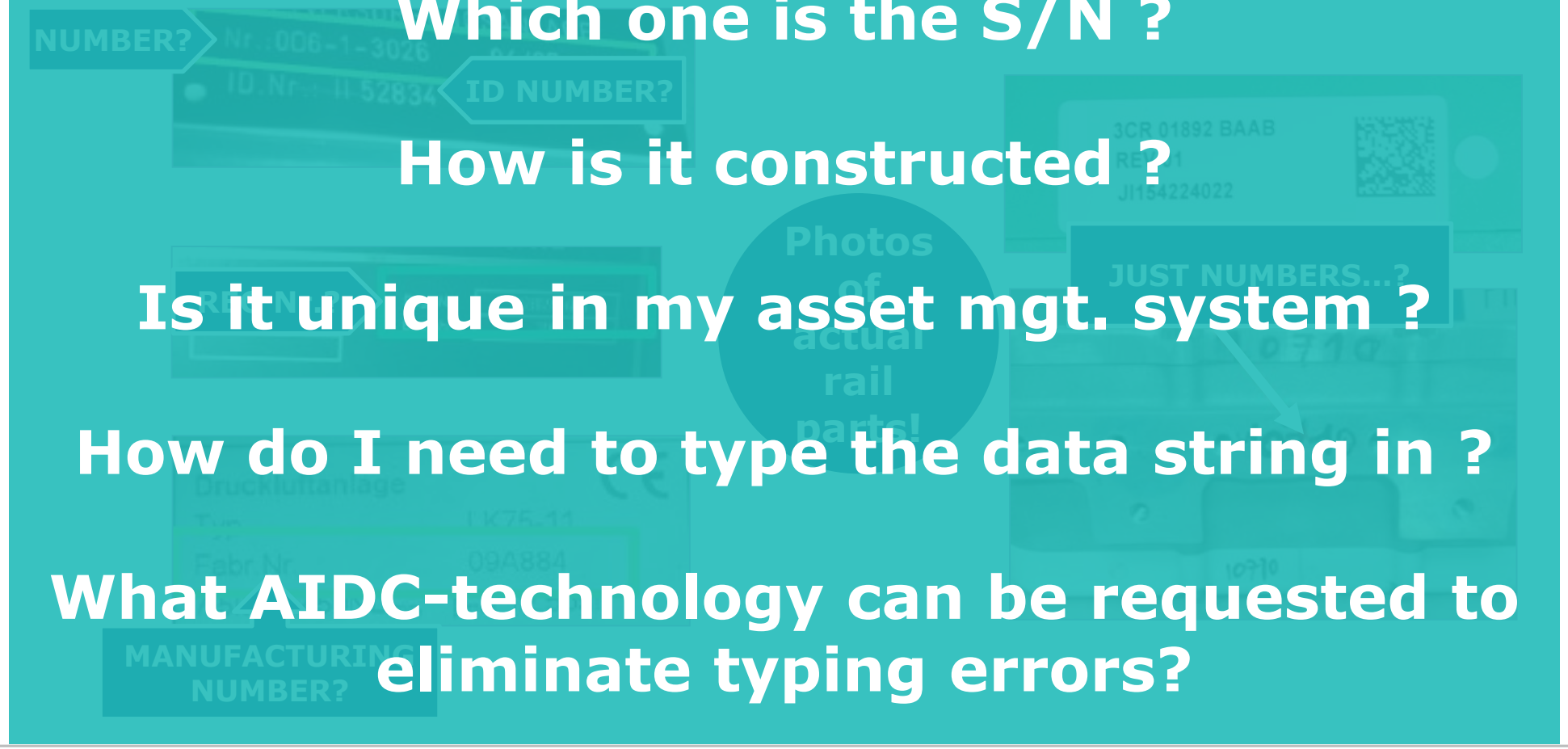




Photos of actual rail parts!

Operational Issues –

Are we talking about the same single item?



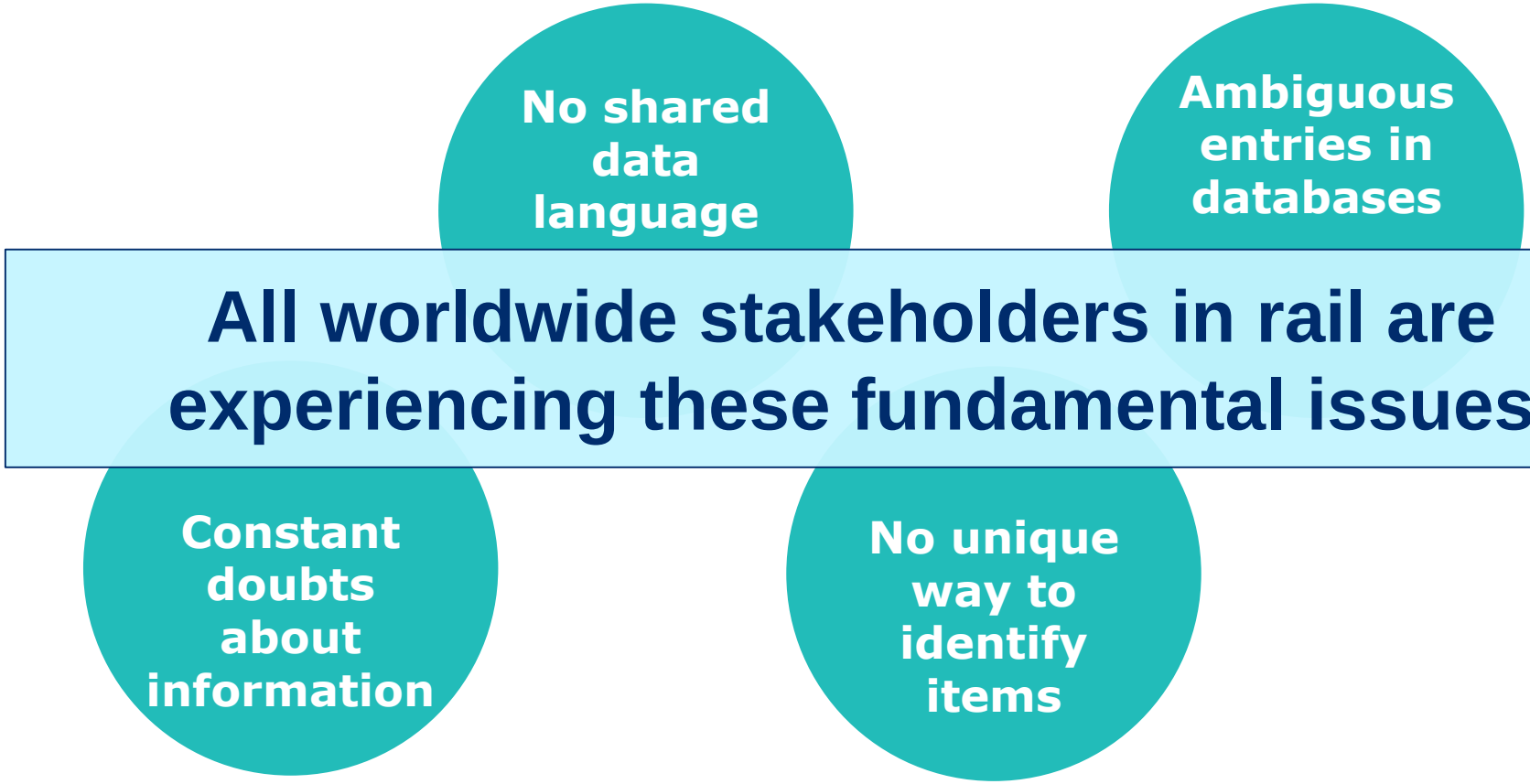
Which one is the S/N ?

How is it constructed ?

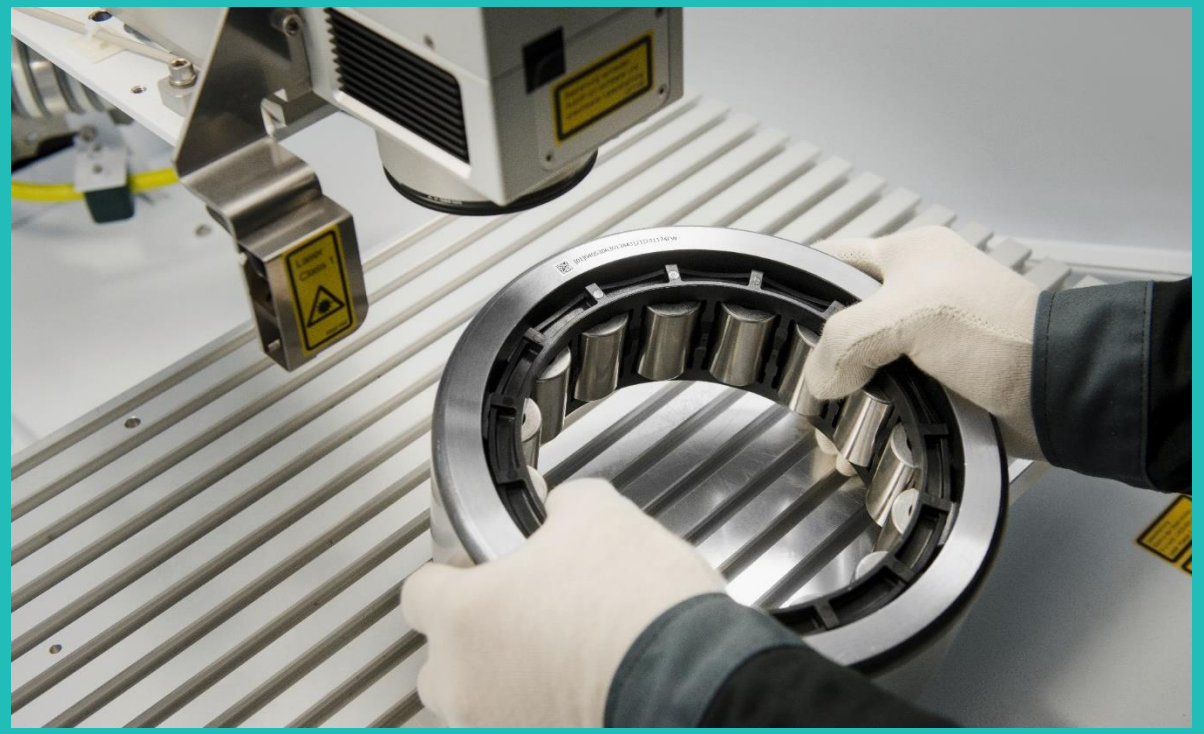
Is it unique in my asset mgt. system ?

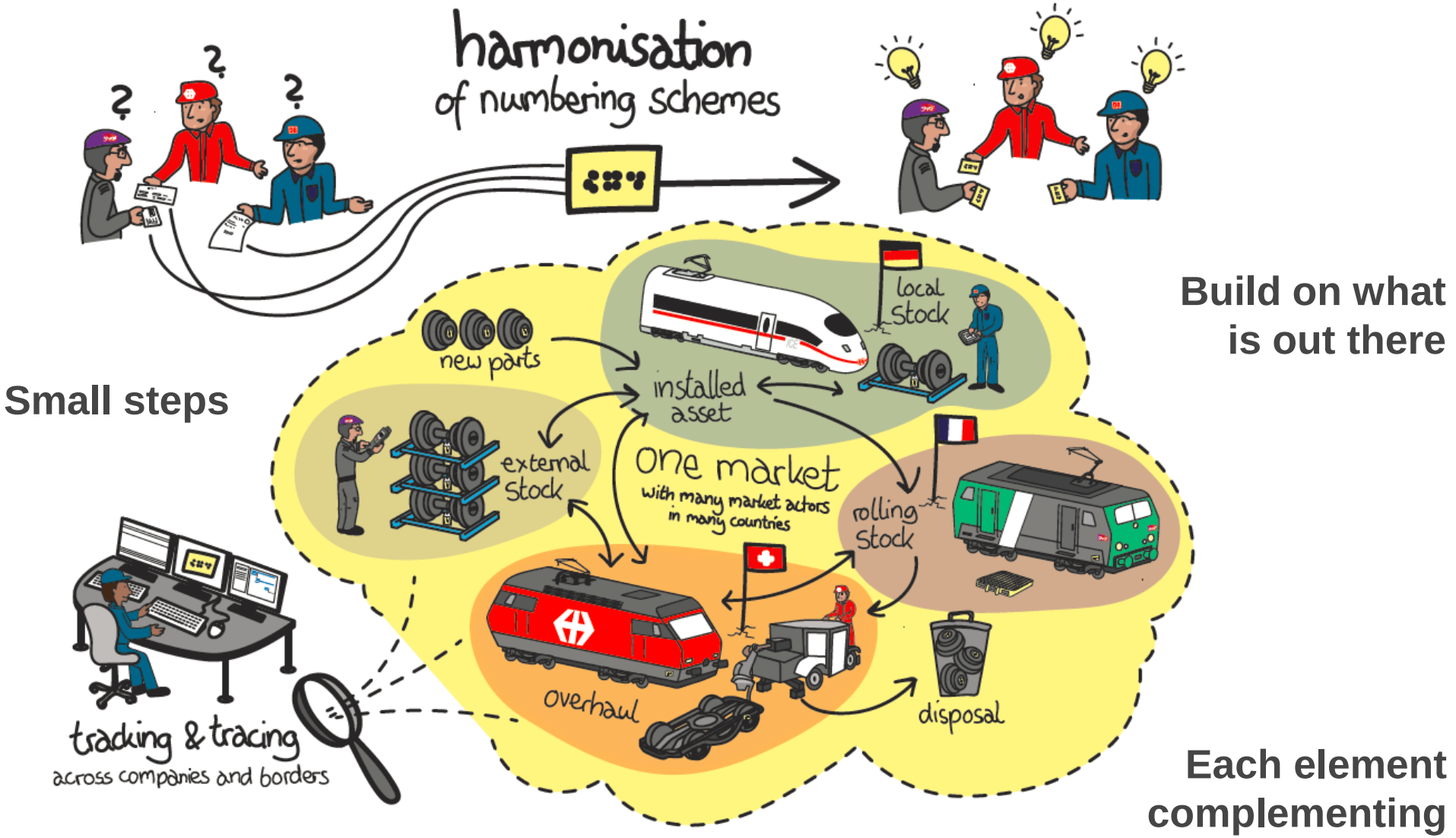
How do I need to type the data string in ?

What AIDC-technology can be requested to eliminate typing errors?


No shared data language
Ambiguous entries in databases
All worldwide stakeholders in rail are experiencing these fundamental issues
Constant doubts about information
No unique way to identify items

3. Industry-driven Vision





Small steps

Build on what is out there

Each element complementing the next

Towards a common vision: THE RAIL CLOUD

Making Rail more competitive

GS1 standards: indispensable basis for competitive railways

Common language avoids confusion and enables collaboration.
Collaboration in Manufacturing and MRO makes Rail operations…

..more efficient,

..more effective

..and safer

What are the benefits

operational data

component life cycle

maintenance history

logistics & storage

internal benefits

external benefits

Warranty periods: Exact determination per piece

Guarantee claims: Exact backtracking

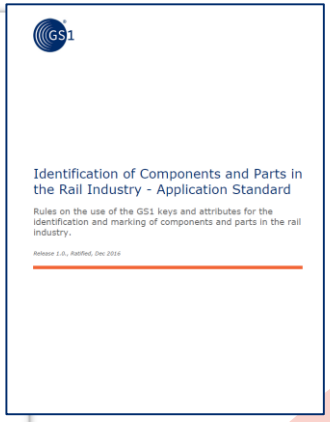
Procurement: Automated processes

Setting a solid foundation for the “rail cloud”

An integrated, innovative, cost effective industry

The global roadmap for rail

For ALL parties involved in the lifecycle of a part



2017

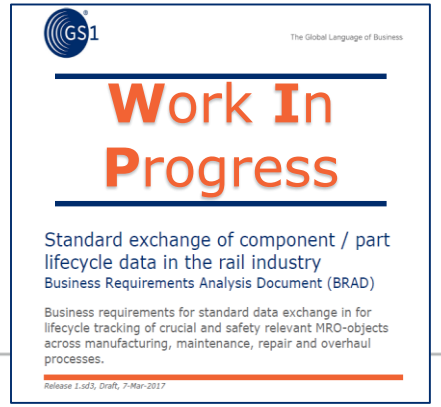
Toolbox for common material marking

(Phase 1)

2018/19

Toolbox for standardised BOM/data exchange

(Phase 2)



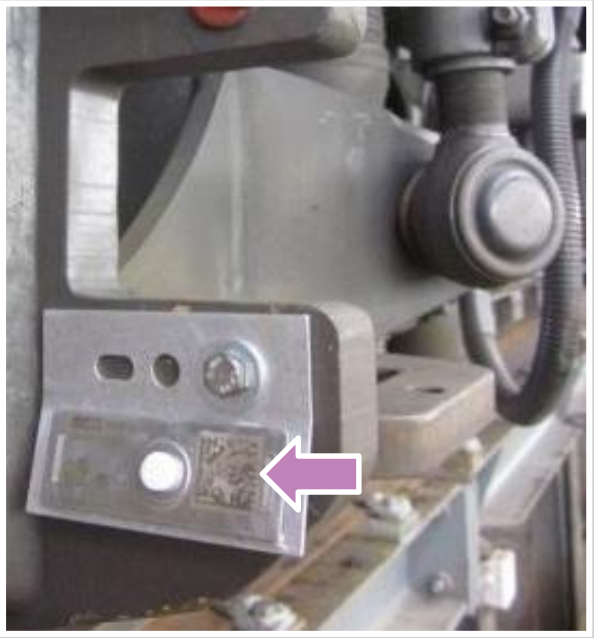
2020 & beyond…

The "Rail Cloud" allows the sharing of configuration, maintenance & part history data

Why GS1 ?

Certain elements in Rail already using GS1 standards

Operator re-tagging initiatives using the GS1 GIAI ID Key



GIAI: Global Individual Asset Identifier

Rail and GS1 - long term collaboration

2012
RFID in Rail

- European guideline for the identification of railway assets using GS1 Standards.
- Identify malfunctioning vehicles before they fail

2015
EPCIS in Rail

- GS1 Application Standard for exchange of rail vehicle visibility data using EPCIS.
- Event-driven, Many-to-many, real-time enabled.

2016
AIDC standards rail components

- GS1 Application Standard for the identification of components and parts in the Rail Industry
- Being implemented in Rail right now.

Next (2017)
Data sharing rail components

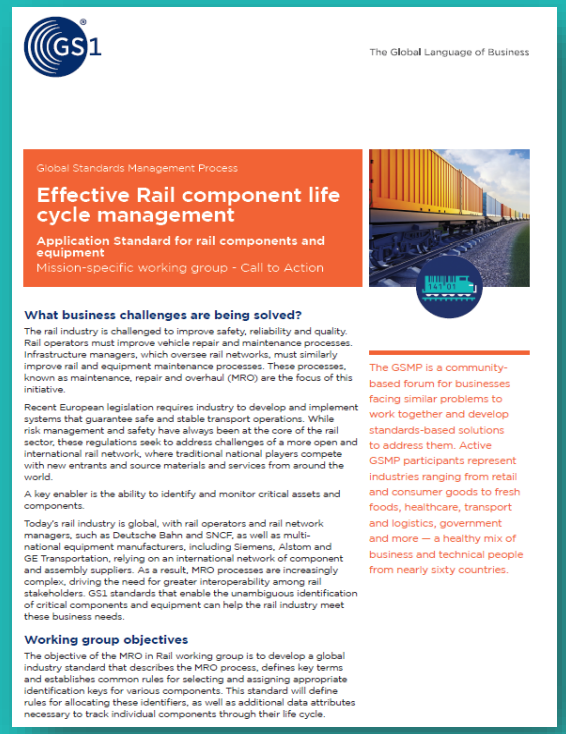
- GS1 Application Standard for the exchange of configuration, traceability and maintenance data for rail components and parts
- Development started January 2017

GS1- Rail collaboration

Who is involved?

Operator	Manufacturer	Solution Provider	GS1
SBB	Alstom	Beijing REN	Australia
DB	Bonatrans	Coriel	Austria
SJ AB	ContiTech	DevCSI	Belgilux
ÖBB	Harting	Learningwell	China
Network Rail (UK)	HFG Transport	smart-TEC GmbH & Co	Finland
SNCF	Knorr-Bremse	SupplyOn AG	Germany
Jernbaneverket / Bane Nor	Siemens	Vilant Systems	India
	TE Connectivity	4PL Central Station	Netherlands
	UGL Limited		Norway
	Unipart Rail Limited		Sweden
			Switzerland

4. Application Standard *(phase 1)*



The Global Language of Business

Global Standards Management Process

Effective Rail component life cycle management

Application Standard for rail components and equipment

Mission-specific working group - Call to Action

What business challenges are being solved?

The rail industry is challenged to improve safety, reliability and quality. Rail operators must improve vehicle repair and maintenance processes. Infrastructure managers, which oversee rail networks, must similarly improve rail and equipment maintenance processes. These processes, known as maintenance, repair and overhaul (MRO) are the focus of this initiative.

Recent European legislation requires industry to develop and implement systems that guarantee safe and stable transport operations. While risk management and safety have always been at the core of the rail sector, these regulations seek to address challenges of a more open and international rail network, where traditional national players compete with new entrants and source materials and services from around the world.

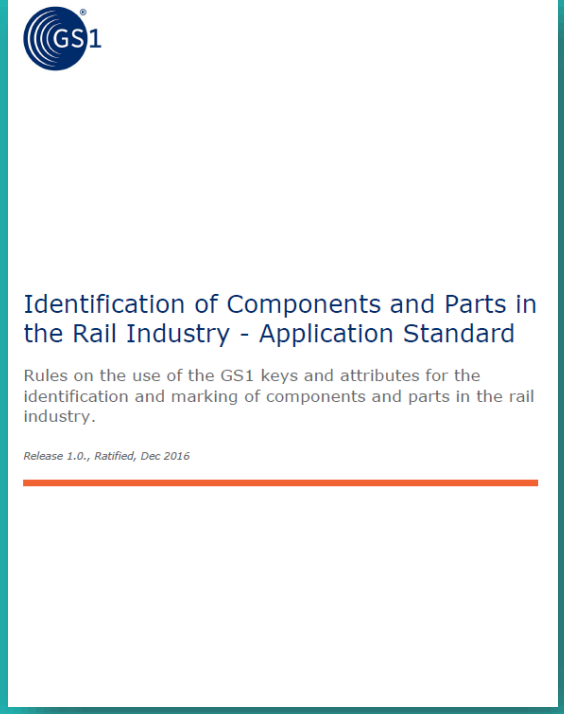
A key enabler is the ability to identify and monitor critical assets and components.

Today's rail industry is global, with rail operators and rail network managers, such as Deutsche Bahn and SNCF, as well as multi-national equipment manufacturers, including Siemens, Alstom and GE Transportation, relying on an international network of component and assembly suppliers. As a result, MRO processes are increasingly complex, driving the need for greater interoperability among rail stakeholders. GS1 standards that enable the unambiguous identification of critical components and equipment can help the rail industry meet these business needs.

Working group objectives

The objective of the MRO in Rail working group is to develop a global industry standard that describes the MRO process, defines key terms and establishes common rules for selecting and assigning appropriate identification keys for various components. This standard will define rules for allocating these identifiers, as well as additional data attributes necessary to track individual components through their life cycle.

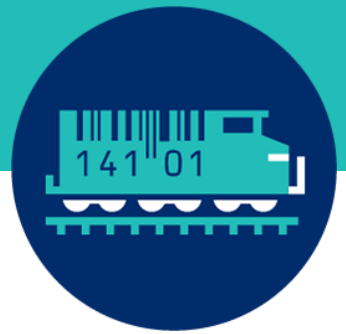
The GSMP is a community-based forum for businesses facing similar problems to work together and develop standards-based solutions to address them. Active GSMP participants represent industries ranging from retail and consumer goods to fresh foods, healthcare, transport and logistics, government and more — a healthy mix of business and technical people from nearly sixty countries.



Identification of Components and Parts in the Rail Industry - Application Standard

Rules on the use of the GS1 keys and attributes for the identification and marking of components and parts in the rail industry.

Release 1.0., Ratified, Dec 2016



Application Standard

Contents of the standard

1. Introduction
2. References
3. Terms and definitions

PART I - GENERAL PRINCIPLES

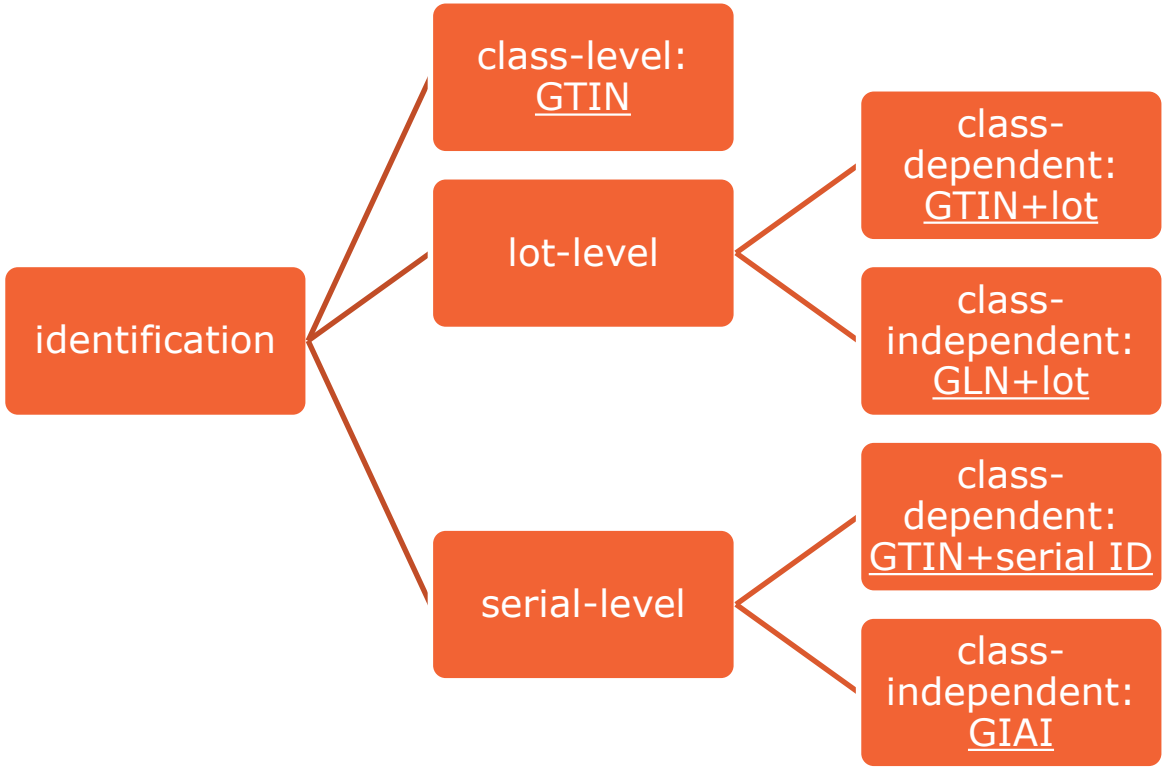
4. Lifecycle identification of MRO-objects
5. Identification and marking principles

PART II – RULES

6. Identification rules
7. GTIN management rules
8. Marking rules (Direct marking, Packaging marking)
9. Technical standards (Data formats, Barcodes, EPC/RFID, HRI / Non-HRI)

Application Standard

Identification levels and GS1 keys



Application Standard

Marking scenarios

Direct marking	Marking at time of production
	Additional marking at time of receipt, installation or refurbishment
	Repairing lost or damaged markings
Packaging marking	Marking of primary packaging
	Marking of secondary packaging

5. Why Implement ?

Why would I implement?

Rail and network operators will have a **universal baseline for identifying materials** when they are received from suppliers.

Manufactures will have a **common, agreed industry standard** to work with in relation to **barcoding** and **tagging** their materials.

Contractors will be **better placed to capture and provide accurate maintenance history** of assets to both customers and suppliers.

System integrators and solution providers will have **clear direction as to the industry's requirements** in relation to identification codes and data capture technologies.

The industry as a whole will benefit by **removing unnecessary cost and waste** in the way it manages materials and assets.

What's in it for you?

6. Next Steps

Advise – **I**nform - **M**anage

GS1 lead :

- Release Call to Action (CTA)
- Communication Plan (internal / external media)
- GS1 Rail Supplier Workshops in each country
- Briefing session at (natl. & intl.) events
- Support / manage implementations (deadline ?)

Industry lead :

- Build intra-company and supplier awareness, supported by CTA, Case Studies
- Active support Communication Plan, GS1 Supplier Workshops, Promotion at events.

Maxime Agache

6. Q&A
- Open Discussion

Increase in **productivity** with higher **cost-savings** starts with a globally-unique identification key

GS1 Standards Event App

Don’t forget to rate this session in the App !!

GS1 Xchange: Where collaboration meets community

GS1 Xchange is your new home for a variety of existing and future GS1 user communities.

This new meeting space includes established communities such as the *GS1 Community Room* and *GS1 WeShare* portals, as well as new communities like the *GS1 Daily Scan*- your fresh source for up-to-date recent GS1 news and industry information.

User benefits include:

- Single sign-on
- Easy navigation between different communities
- Improved experience

Join today!
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