



WE ENSURE MOTION

# **ID in Rail: Serialization of components and traceability**



**GS1 GIAI**

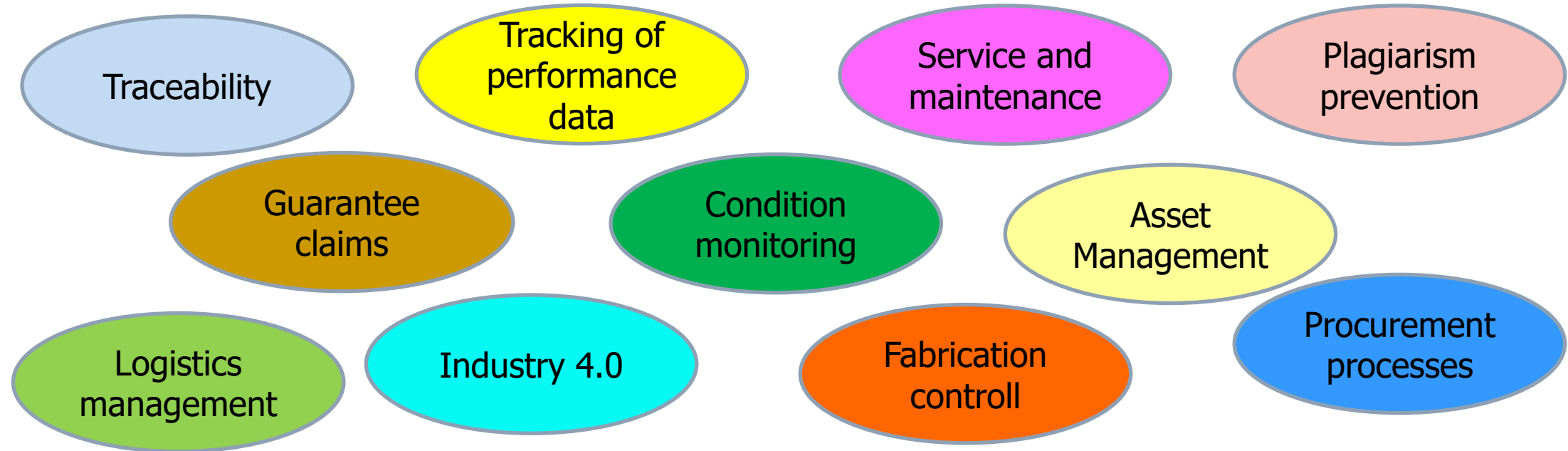
(8004)405822640000000901458951



InnoTrans Convention 23. September 2016  
- HFG Transport-Technik GmbH, Frank Wachendorf -



1. Why serialization of railway components?
2. MRO in Rail: A standard for the sector
3. Marking technologies
4. Best practice example
5. Chances and prospect

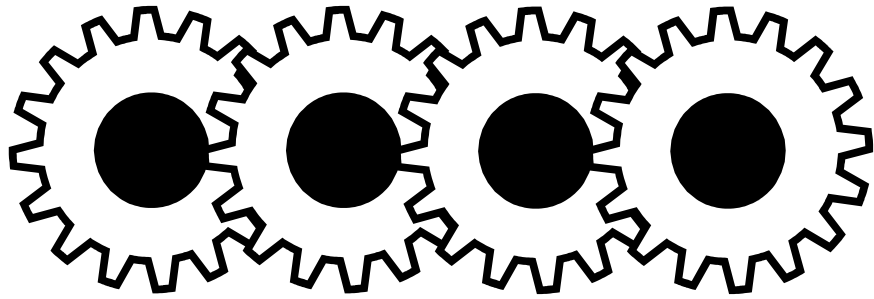


...requires:

A basic technologie to record...  
**...individual lifecycle histories**

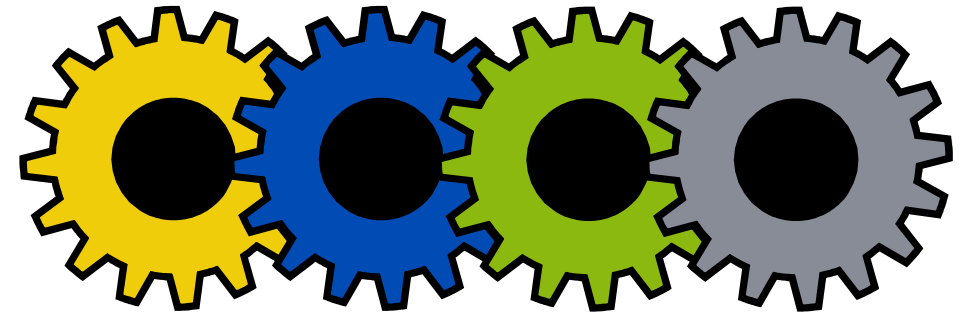


**Serialization means:**



**Bulk of anonym components**

**Transformation**

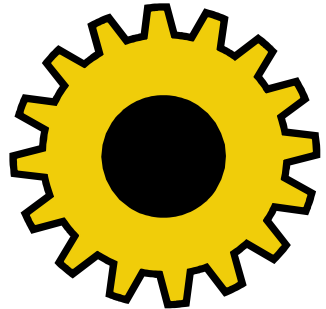


**Each component is an individual**

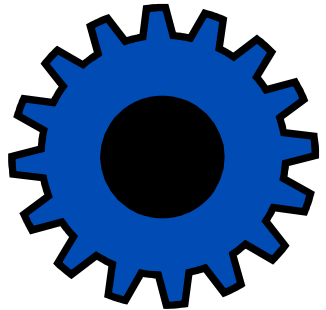
**Individualization with a  
consistent numbering scheme**



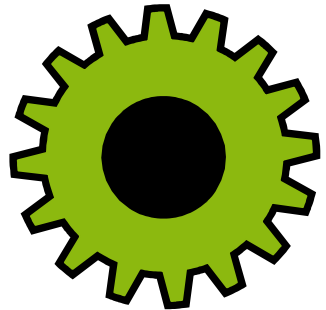
## Serialized components:



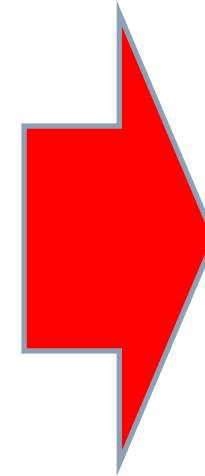
Event 1: A is stocked  
Event 2: A is released  
...



Event 1: B is mounted  
Event 2: B is removed  
...



Event 1: C is checked  
Event 2: C is repaired  
...



### Identification of railway components today







## Requirements of a standardized numbering system:

### Numbering scheme

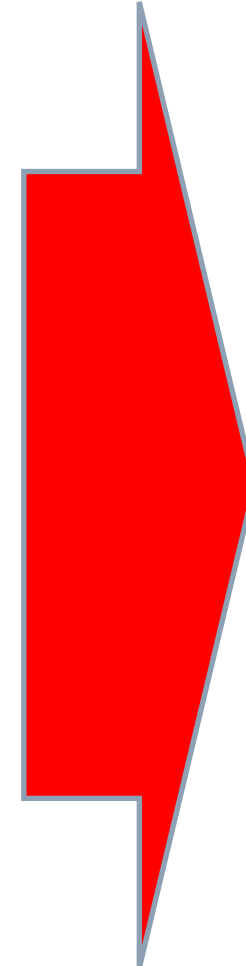
- Definition of a standardized, uniform „language“

### Hierarchy and configuration

- What is the leading component?
- How is the hierarchy described?
- Are assemblies of components only marked once?

### Allocation rules

- Does the number stay the same for the whole lifetime?
- Who is responsible for the marking at which position in the life cycle?



**Accessible  
and  
transparent**

**For all  
players in  
the sector**

**Inter-  
national**



### PROJECT GROUP: MRO in Rail

- International working group
- Cooperation of train operators, railway industry and GS1 global







Global Standards Management Process

### Effective Rail component life cycle management

Application Standard for rail components and equipment

Mission-specific working group - Call to Action



**TARGET:**

Setup of an application standard within the GS1 syntax for the **Identification of Components and Parts in the Rail Industry**



### Worldwide unique identification within the GS1 system:

**Producers' perspective**

**sGTIN** (serialized GTIN, Global Trade Item Number)  
For serialization of trade items assigned by the **producer**, contains international unique article number

(01) 4012345 1234563456 (21) 123456

Company prefix producer      Article number producer      Serial number producer

GTIN

Unique serialized article number (sGTIN)

**Owners' / operators' perspective**

**GIAI** (Global Individual Asset Identifier)  
For serialization of assets / capital goods by the **owner**, contains no article number

(8004) 4052119 1234ABC123

Company prefix owner      „Inventory number“

Unique number of asset (GIAI)

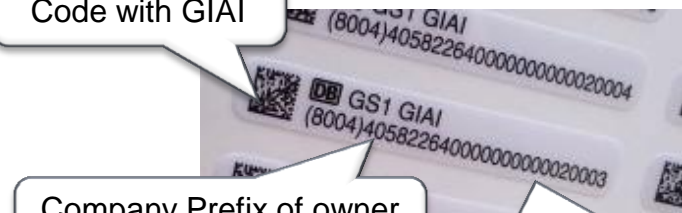
**GS1-Datamatrix-Code with sGTIN**

GS1-Producer+article number in the international unique format **GTIN**



The GS1- serial number, together with the GTIN, forms the international unique **sGTIN**

**GS1-Datamatrix-Code with GIAI**

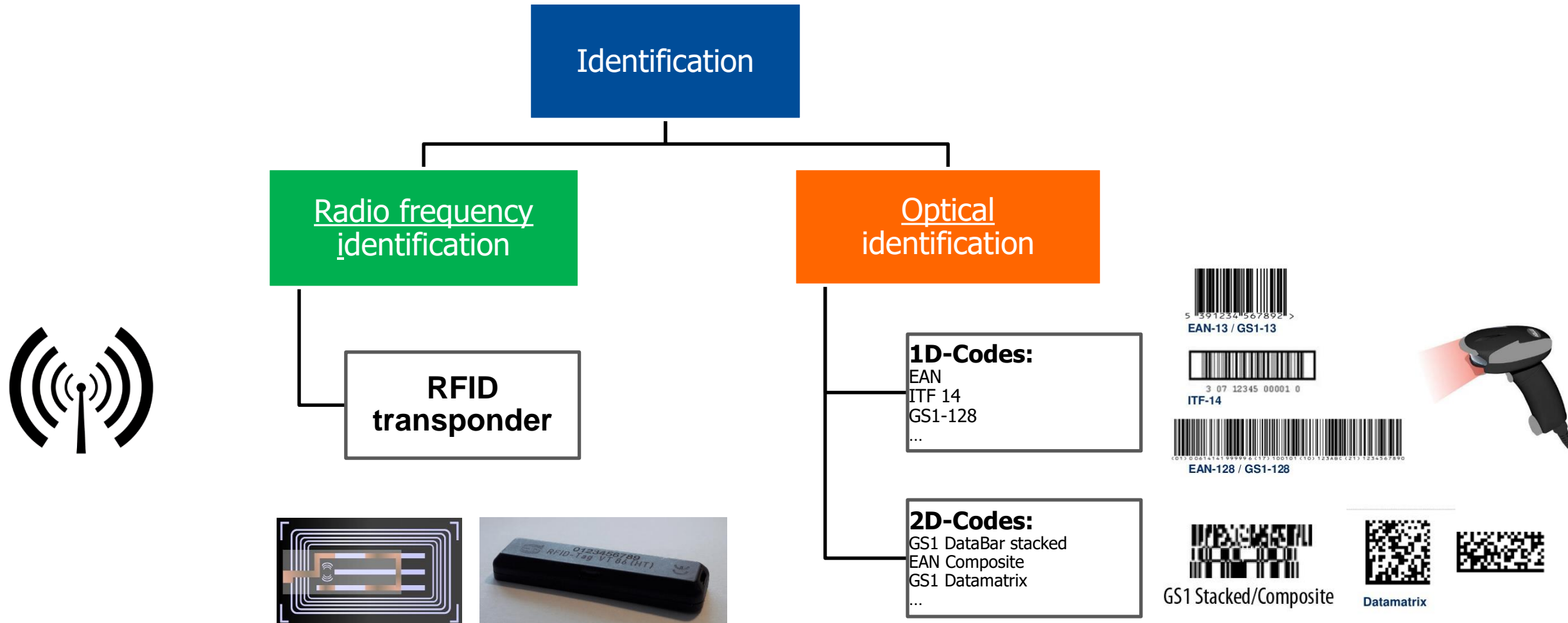


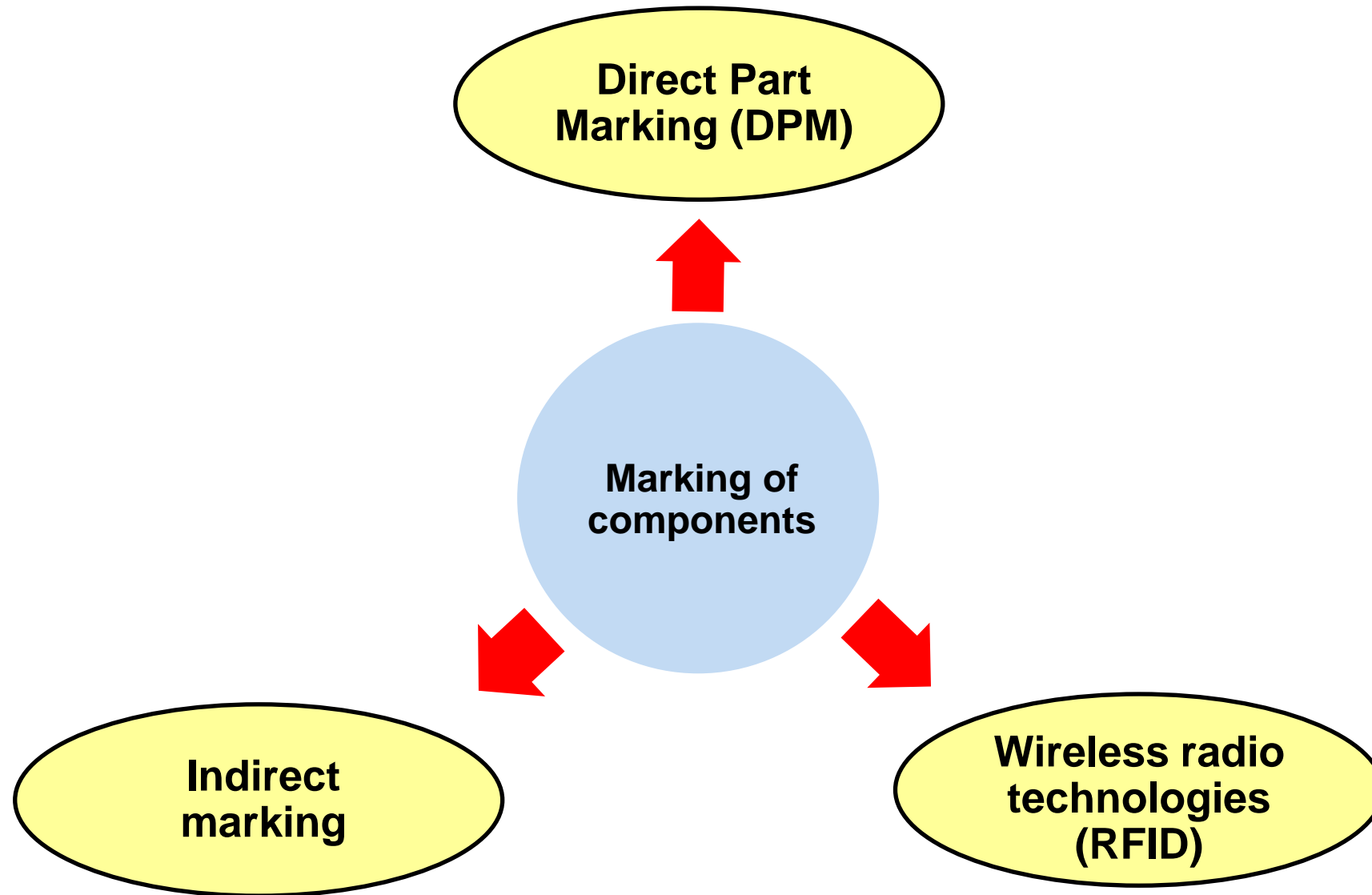
Company Prefix of owner (40582264)

Serial number assigned by owner

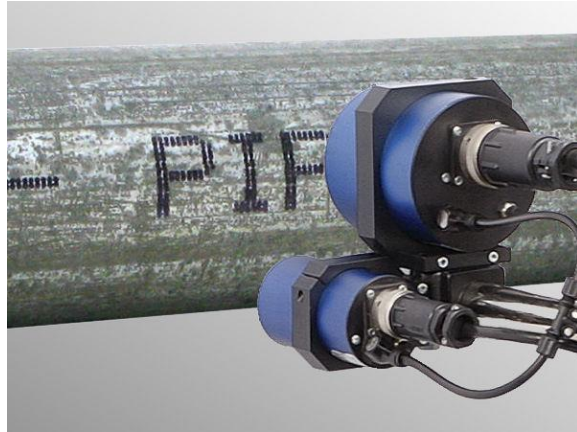


## Data carriers within the GS1 system:

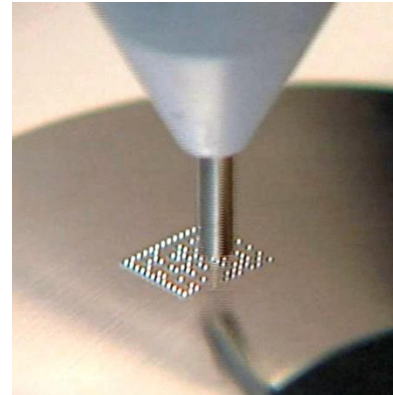








## Direct Part Marking (DPM)



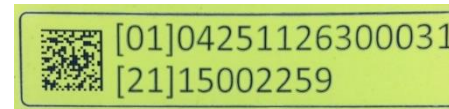
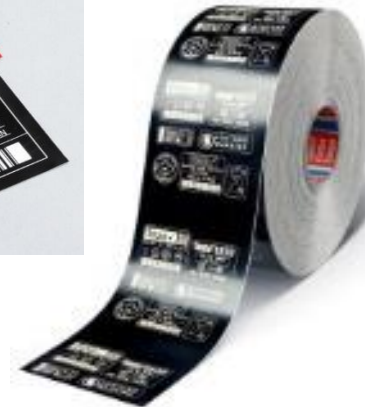
**Printing solutions**  
(Continuous Inkjet - CIJ)

**Needle solutions**  
(microdot scribes)

**Laser solutions**  
(tempering, engraving)



## Indirect marking



**Printable tags**  
(paper / plastic labels)

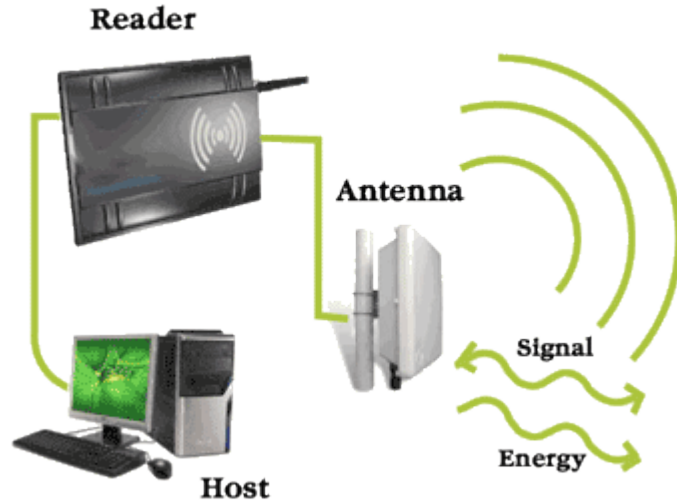
**Laser films**  
(engraving, colour change)

**Plates**  
(metal, plastic)

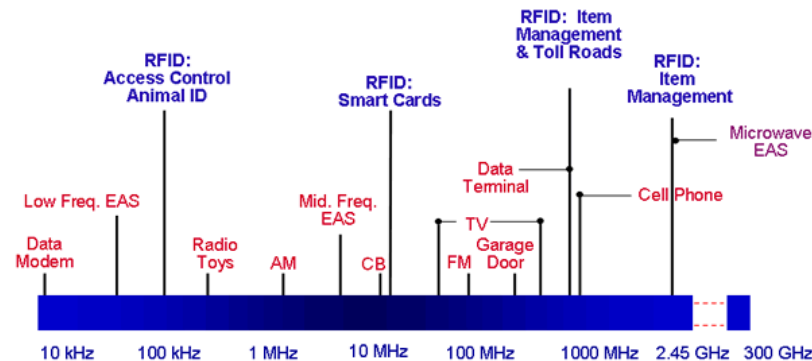




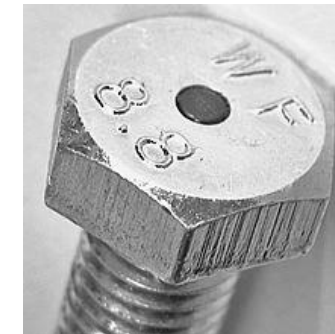
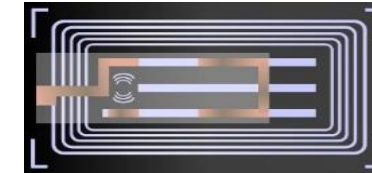
## Wireless radio technologies (RFID)



### RFID Frequenzen



Frequenz	125 kHz	13,56 MHz	900 MHz	2,45 GHz
Wellenlänge	2.3 Km	22 m	33 cm	12 cm



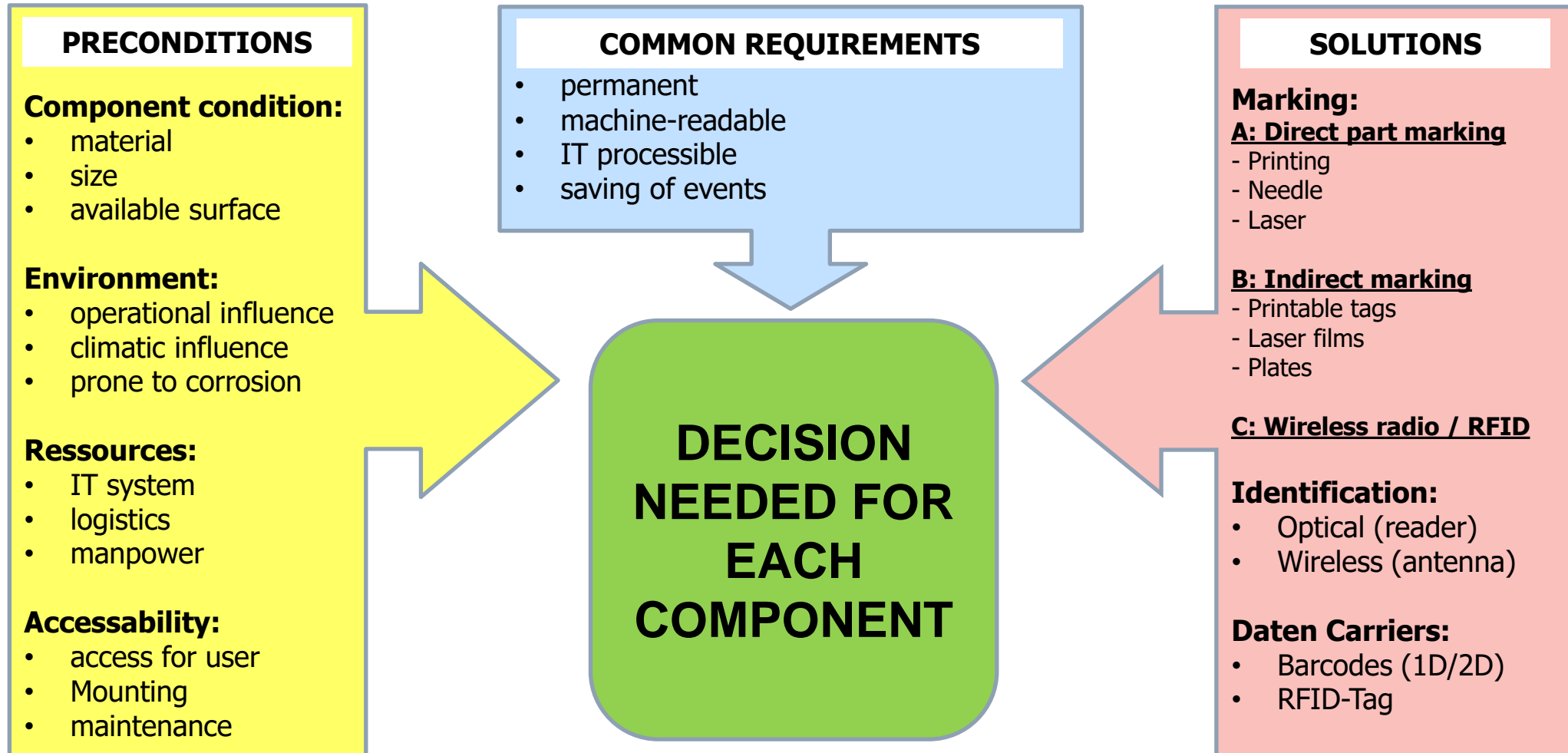
**Hardware setup**  
(transponder, reader, host)

**Radio frequencies**  
(LF, HF, UHF, MW,...)

**Transponder**  
(inlay, label, hard tag,...)



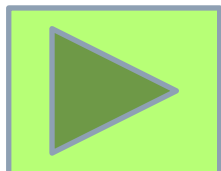
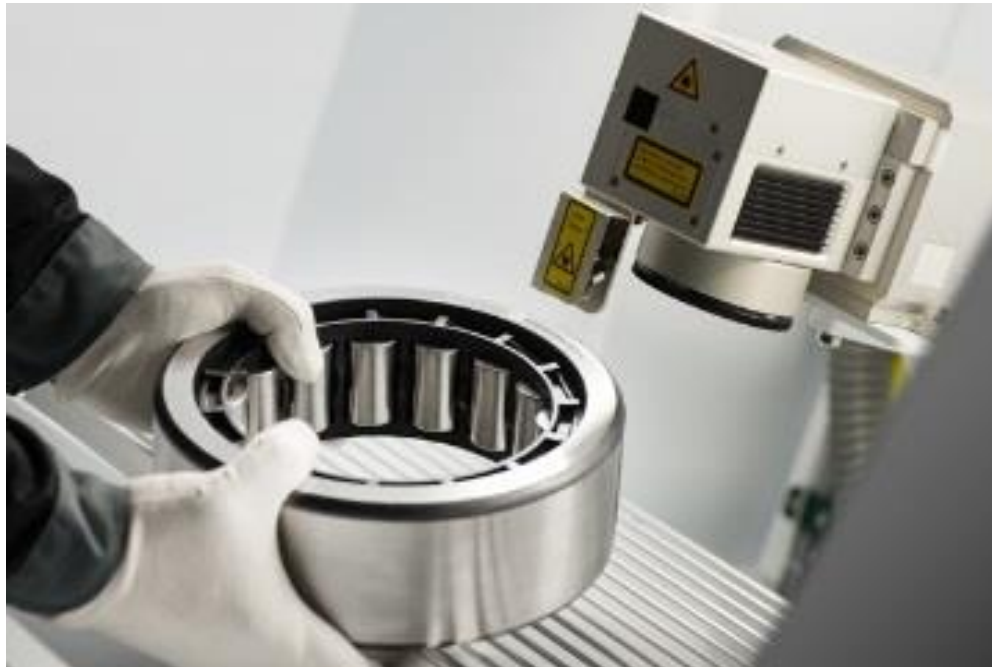
## There is no universal solution for the marking of components:

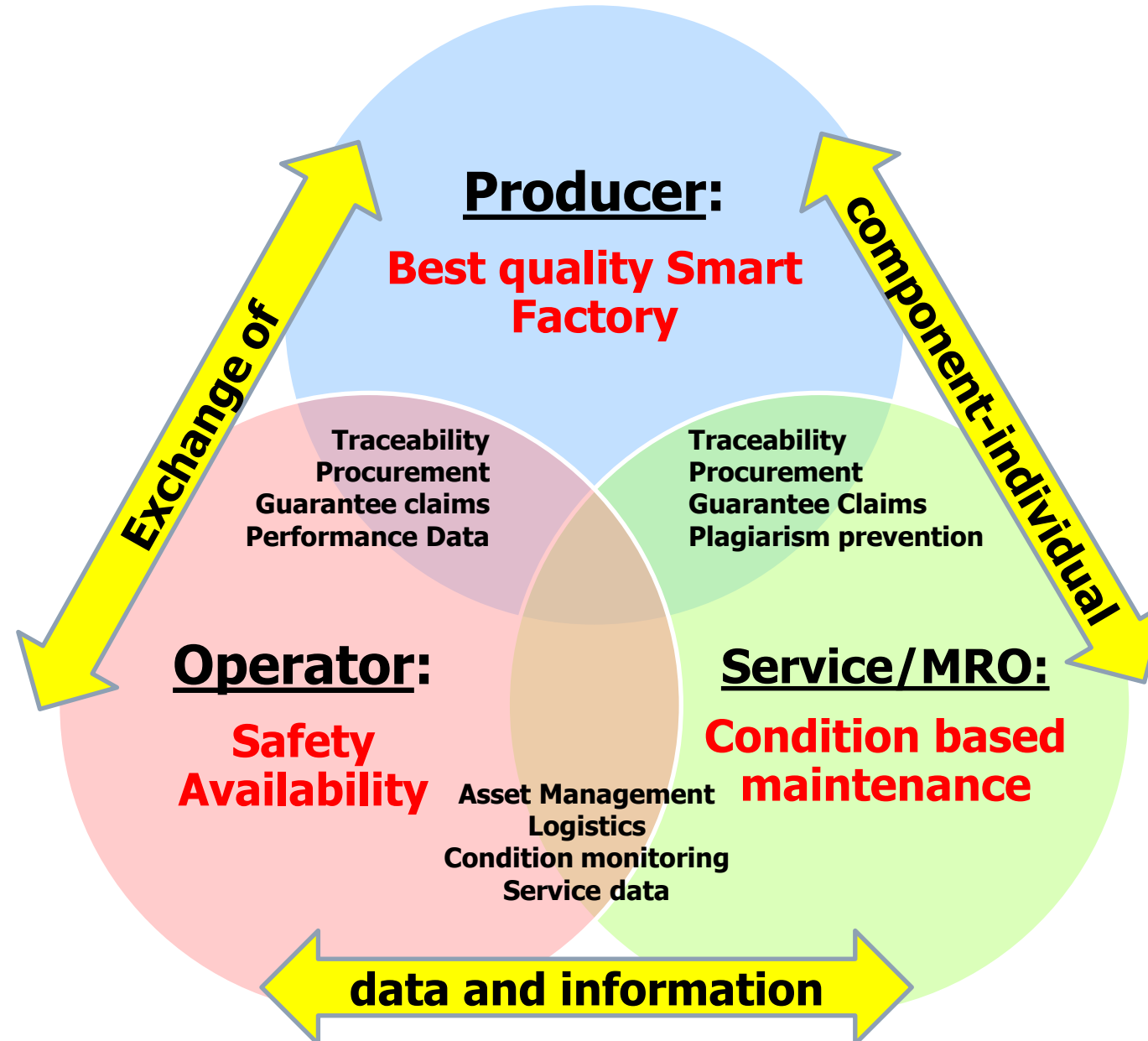




### Wheelset roller bearings

- Laser marking (engraving)
- GS1 sGTIN / GIAI and GS1 Datamatrix-Code
- Marking within overhauling process of components







LET'S GET STARTED

