



# History of Barcode

2023-10-17

**Heinrich Oehlmann**



# History of Barcode



## Reasons for Barcode

Communication from items to computers:  
QUICK - ERROR FREE - AUTOMATIC

- for Point of Sales: more speed, more money
- for healthcare: less manual entry, more security
- for industries: automation, more accuracy
- governments: secure data entry for transparency and traceability



idea(s)



1838 →



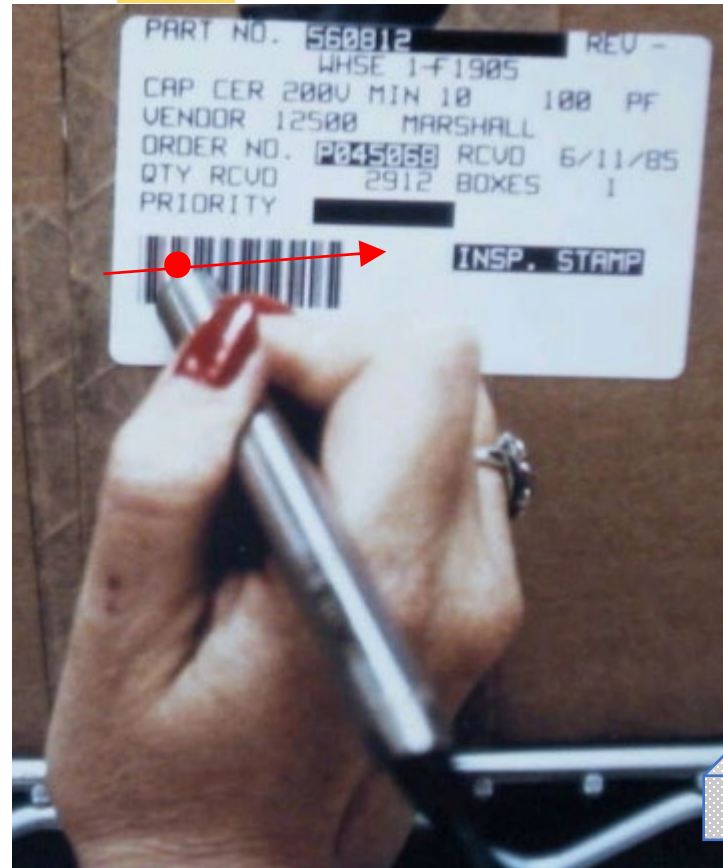
1960/70s →





# BARCODE

1971



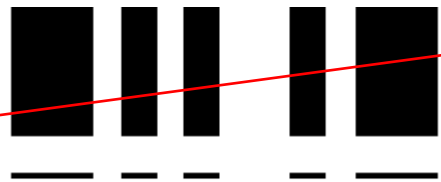
1985



1994 Imagers ----->



P045068



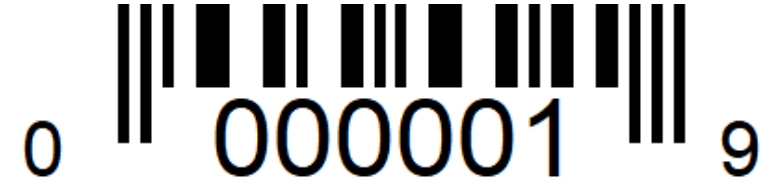
A

**1973**

***U.P.C.***

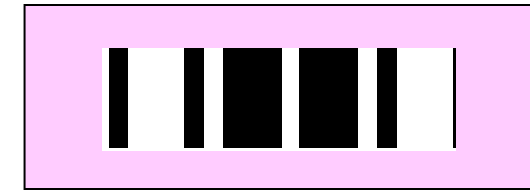
**1977**

**→ *EAN***



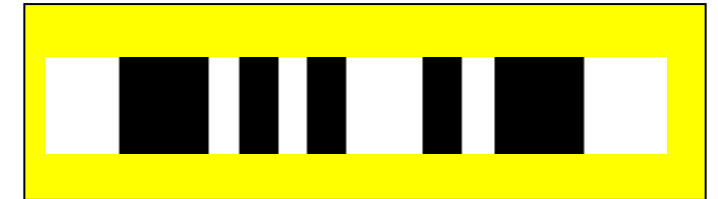
**1972**

***Code 2/5i numeric  
Characters 0 -9***



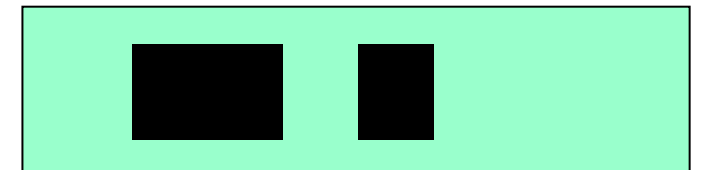
**1974**

***Code 39 alphanumeric  
(A-Z capitals)***



**1981**

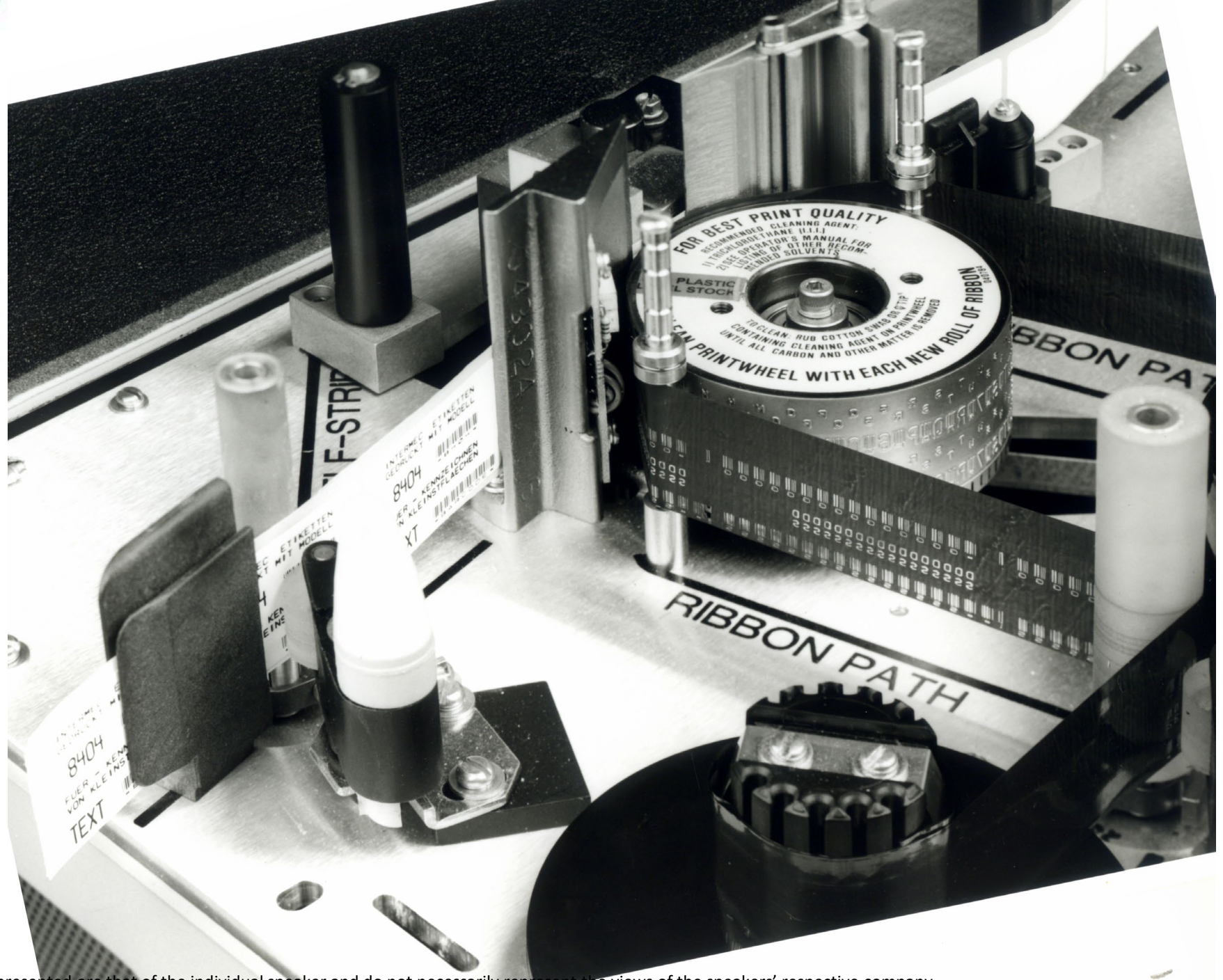
***Code 128 alphanumeric  
+ control characters***

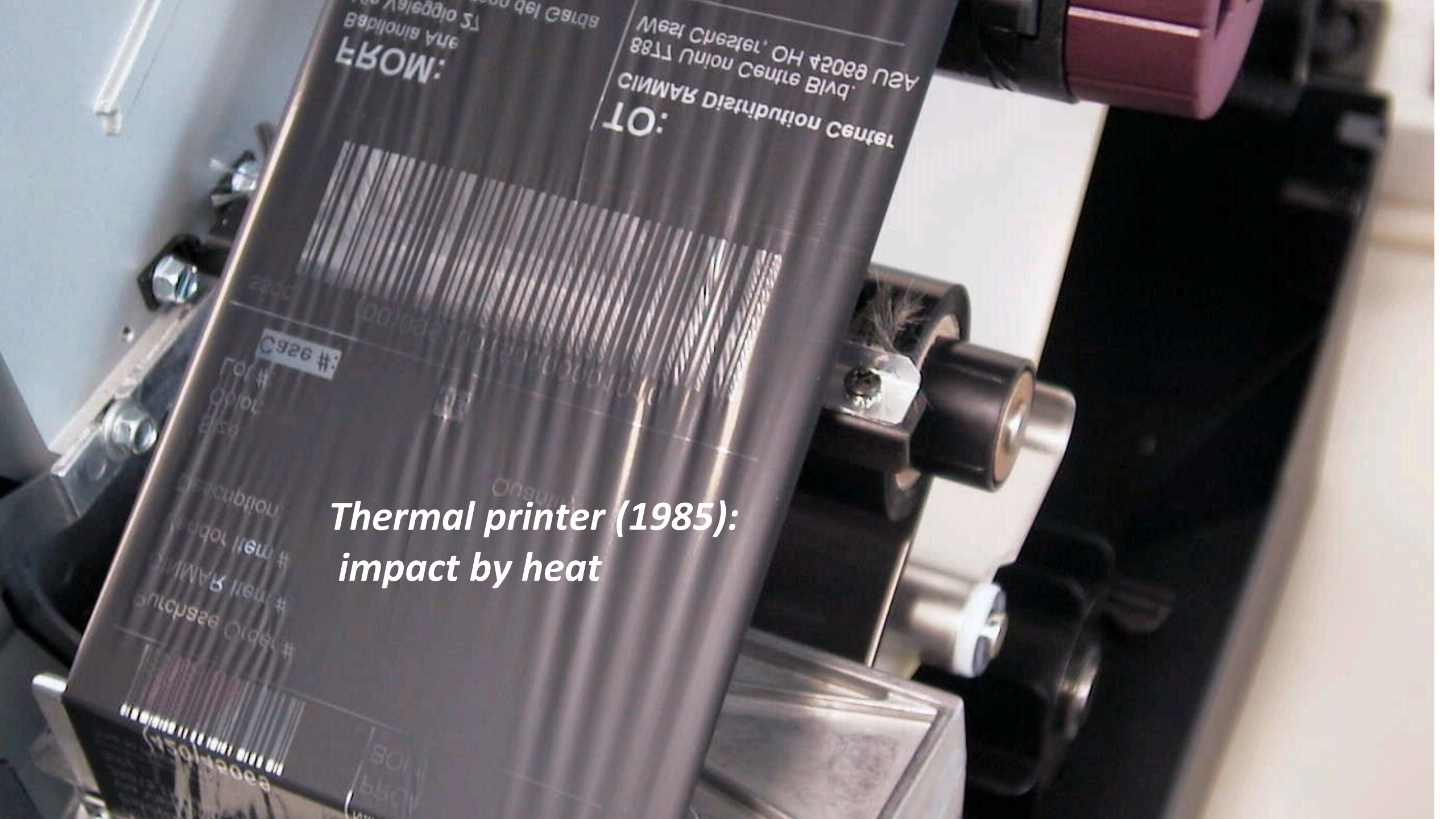






***Impact printer  
(hammer printer)  
1985***





***Thermal printer (1985):  
impact by heat***



# Light pen (Wand) model 1983



# Laser scanner 1985

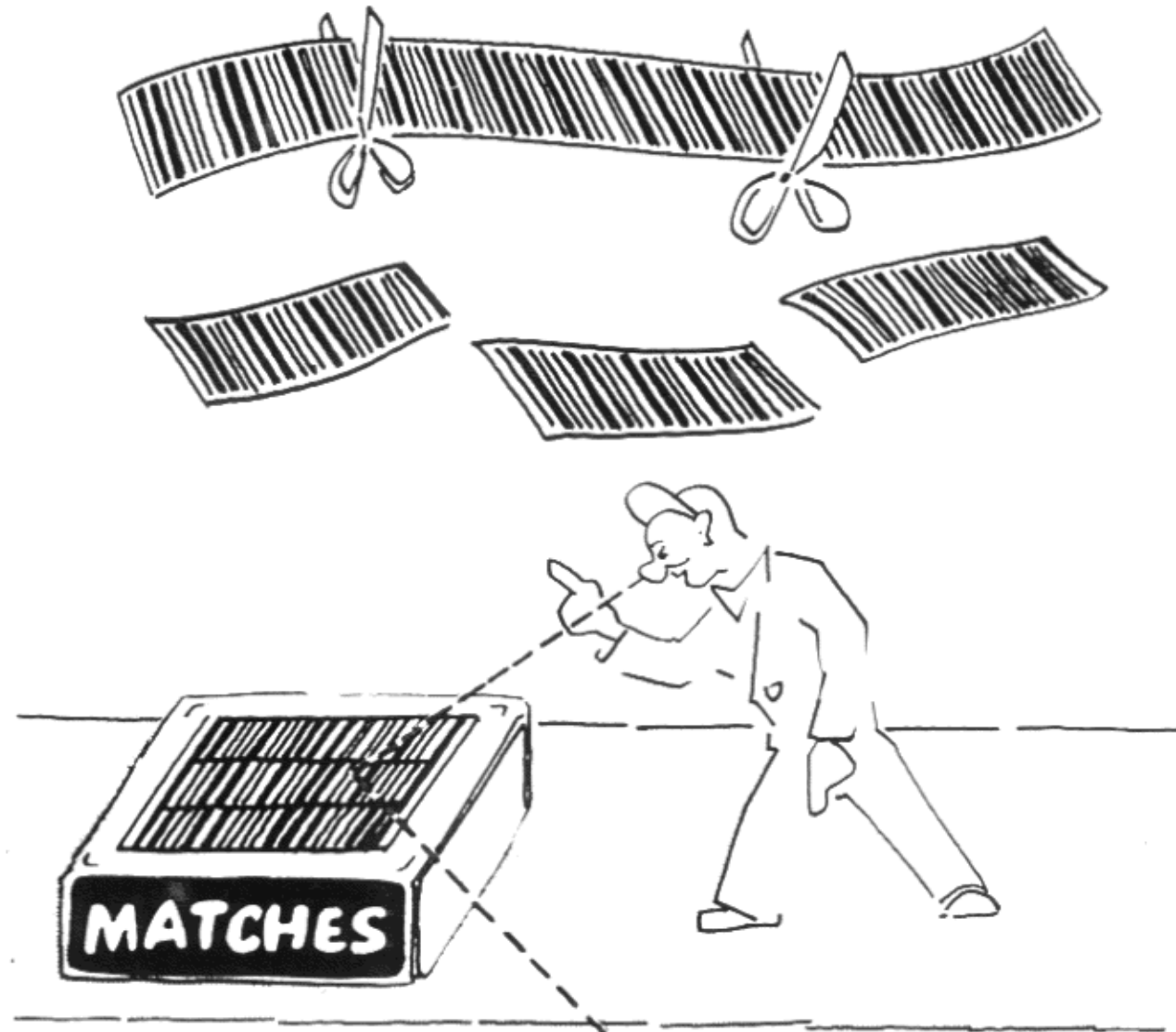


# Laser Mobile 1988





**1989 toward 2D**  
*with 1D scanners*



★ **CODABLOCK**  
*Developed by Harald Oehlmann*



**scan with standard  
linear scanners**

**1989**

***CODABLOCK***





# Continuous development

2022



1973



JAB High Cap.



Han Xing Code



Data Matrix



QR



ATZTEC



PDF 417



CODABLOCK F



CODE 128

BARCODE KOMMUNIZIERT

an 1850

an 3500

an 50



CODE 39

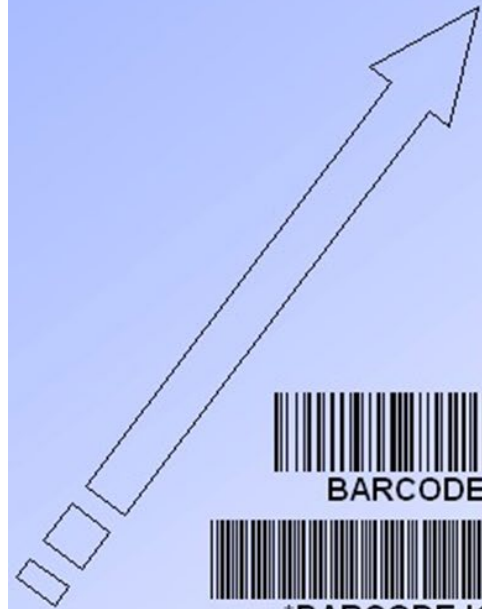
an 30

\*BARCODE KOMMUNIZIERT\*



U.P.C./EAN13

n 12/13





**USD-1** AUTOMATIC IDENTIFICATION MANUFACTURERS  
 UNIFORM SYMBOL DESCRIPTION—1  
 INTERLEAVED TWO OF FIVE 5/1981

SC31 N 0335  
 CD-Ballot, 01.09.98


**AIM International ITS/97-001**  
 Date: 1997-03-01  
 Secretariat: AIMI, Inc  
 Document type: AIM International Technical Standard

**Symbology Specification – QR Code**

**AIM** AIM International, Inc.

**AIM EUROPE**  
 UNIFORM SYMBOLOGY SPECIFICATION -  
 CODABLOCK F

11/1994




AIM<sup>USA</sup> Technology Group  
 5/24/94 BC021

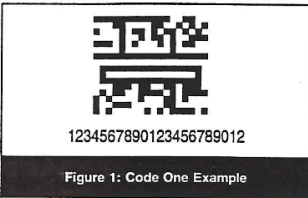
**Uniform Symbology  
 Specification  
 PDF417**

5/13/94



AIM<sup>USA</sup> Technology Group  
 5/24/94 BC022

**Uniform Symbology  
 Specification  
 Code One**



**CODE 128**

Uniform Symbology Specification  
 Revised May 1996





# Codes & Key Persons I

- **David Allais** 1972: 2/5, then i2/5, 39, 49, 93 symbologies and printing, reading, interfacing: INTERface MECanism (INTERMEC)
- **Dennis Priddy** 1989: Data Matrix promotion
- **Ted Williams** 1981: Code 128
- **Harald Oehlmann** 1989: CODABLOCK, 2020: DMRE
- **Andy Longacre** 1995: Atztek
- **IBM team** 1988: BC412 (for wafers)
- **Denso team:** 1995 QR Code, then Macro QR and Rectangular QR

# Codes & Key Persons II

- **CHINA team** with Wang Yie 2020 (ISO....): Han Xing Code
- **Fraunhofer Inst.** Germany with Waldemar Berchtold: 3d JAB code

Other codes of the pioneer time:

- Plessey Code 1971
- CODABAR 1972
- Nixdorf code 1981,
- etc.

See: Barcode book  
Bernhard Lenk

LINES of Communication  
Craig Harmon



Craig Harmon



Bernhard Lenk

Heinrich Oehlmann



**going global**  
**=going standards**





# AIDC going global

1996: ISO + IEC = ISO/IEC TC 1/SC 31



2003 Paris, SC 31 Plenary, Chair: Alain Habermann



# Achievements

Complete set of standards for Barcode symbologies and quality (WG1), RFID technologies (WG4), data structures (WG2) and applications (WG8).



2016 Sapporo, SC 31 Plenary, Chair: Dan Kimball



# Achievements



- Technology standards: Barcode, 2D, RFID
- Quality & test specifications for codes and equipment
- Data structure standards e.g. for uniqueness (ISO/IEC 15459-n)
- Application standards for application of Barcode & RFID



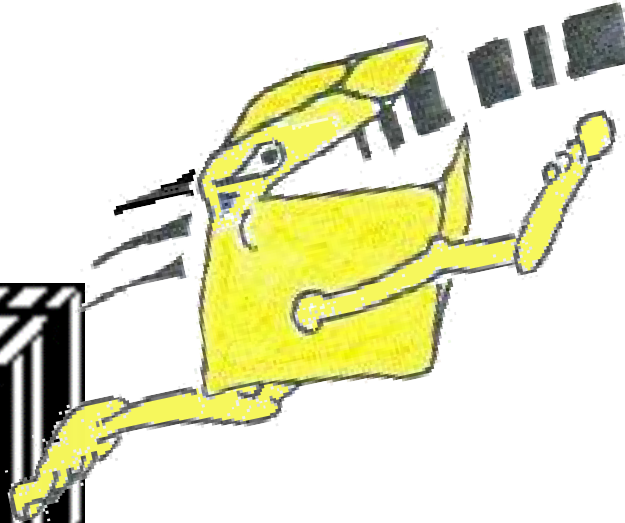
# Focus on „GLOBAL UNIQUENESS“ why?



01234567XY

1234567XYZ

001234567X

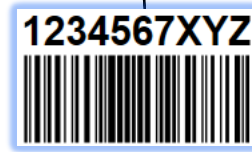


I would need an  
explanation:  
what is: 1234567XYZ



# Do you understand barcode language „ASC DI“

I'm a Transport unit from LILY, my No. is 1234567XYZ



ok

Yes, now I understand:

I see the flag „J“, it's truly a Transport unit



(J)QCLILY1234567XYZ

- ASC Data Identifier for Transport Units „J“
- Registration Authority ID „QC“
- Registered Company ID „LILY“
- Package No. <35an





# Global AIDC language „ISO/IEC 15418“ (1997)

*ASC DIs & GS1 AIs apply uniqueness for the entire supply chain,  
Any item gets an unique identifier according to global ISO standards  
for globally unique item identification*



content

**Jxxxx** Unique Transport Unit – **Agency/Company/Transport no.** ( or AI “00”)

**1Bxxx** – Returnable Container ID (or AI “8002”)

**Sxxx** -- Serial number ( or AI “21”)

**1Hxxx** -- Worker ID (or 25H - **Agency/Company/Serial number**)

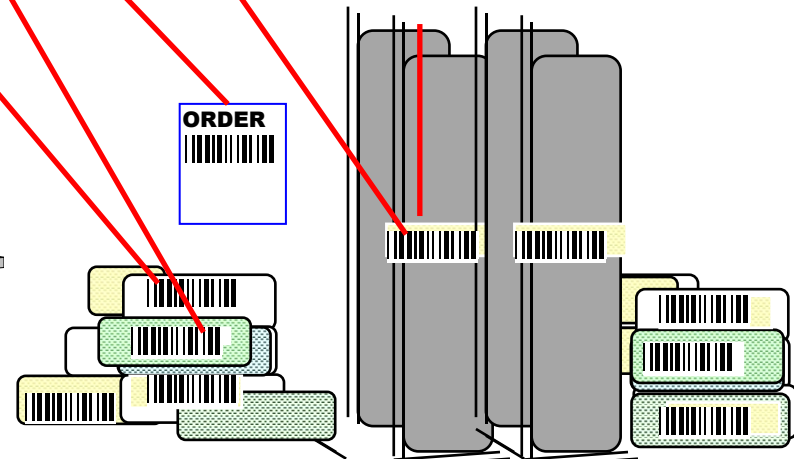
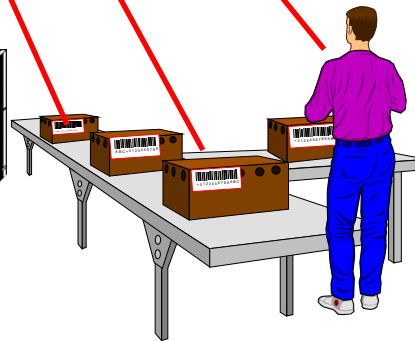
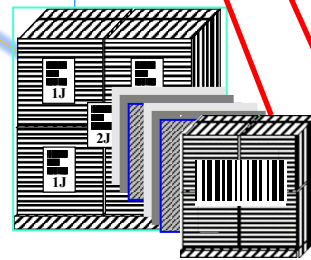
**25Pxxx** – Product ID (**Agency/Company/Product** + 1Txxx Charge/Lot)

**01xxx** – Product ID (**Agency/Company /Product** [GTIN])

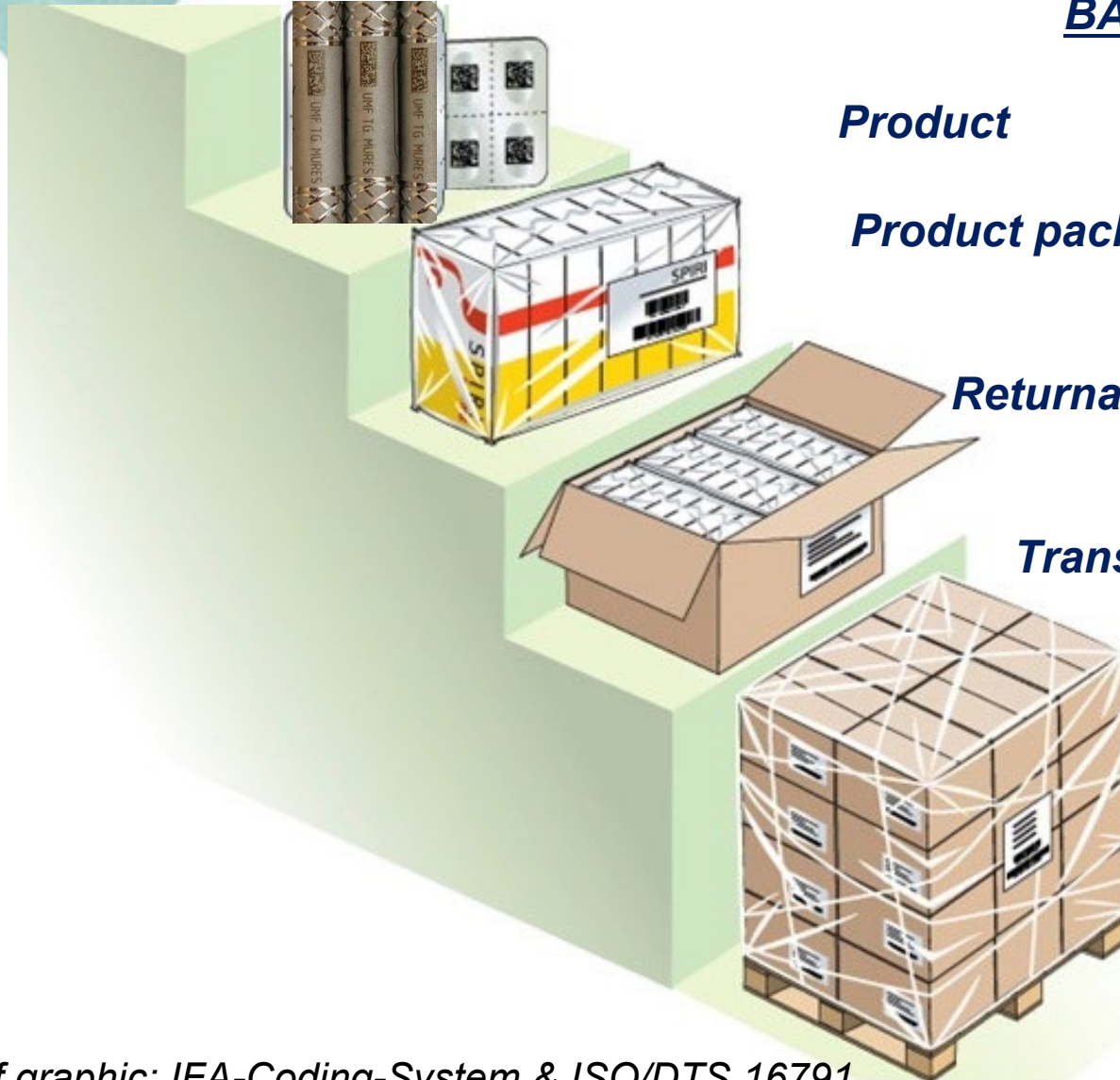
**Kxxx** -- Reference

**Lxxx** Location (or 25L...)

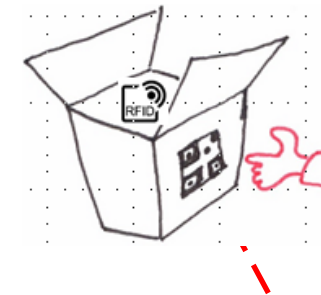
content



# ISO application standards for uniqueness at any level:



	<u>BARCODE</u>	<u>RFID</u>
<i>Product</i>	ISO 28219	ISO 17367
<i>Product package</i>	ISO 22742	ISO 17366
<i>Returnables</i>	ISO/IEC 15459-5	ISO 17366
<i>Transport Unit</i>	ISO 15394	ISO 17365



**Problems to solve and solved  
by standards, e.g. for codes with DIs:**

**„Keyboard & WEB compatibilty“**

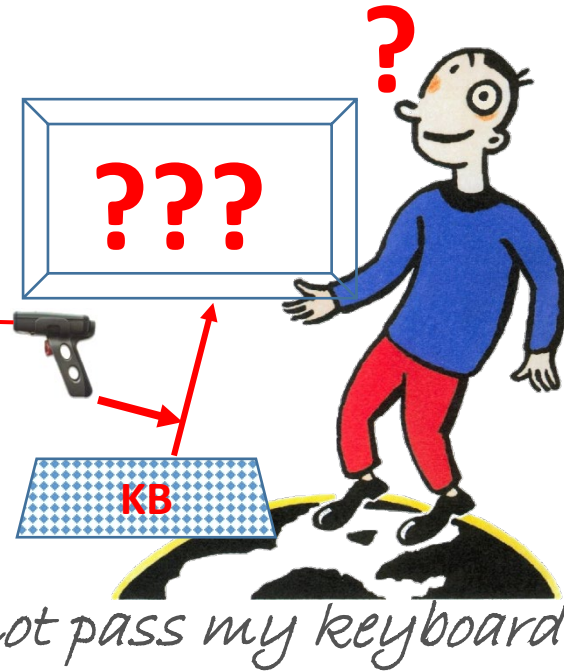






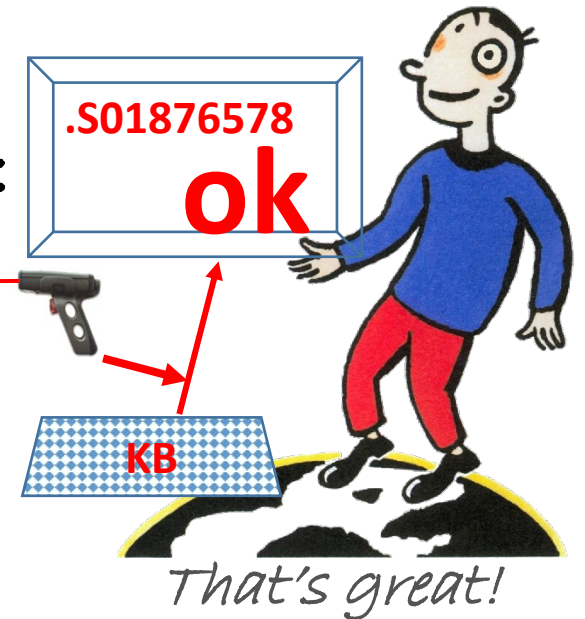
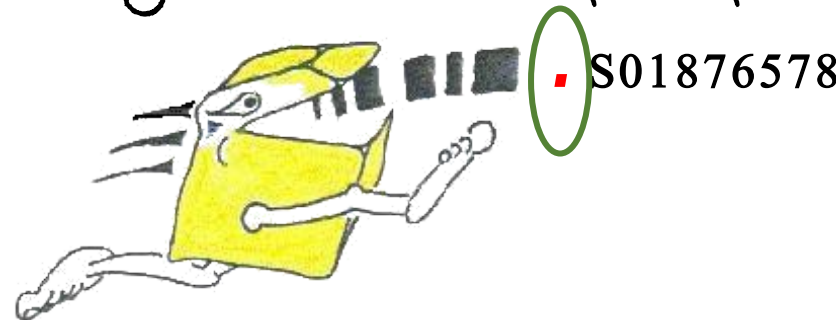
The problem of incompatibility  
 ISO/IEC 15434 control ch. do not  
 pass keyboards, nor WEB interfaces

ISO/IEC 15434



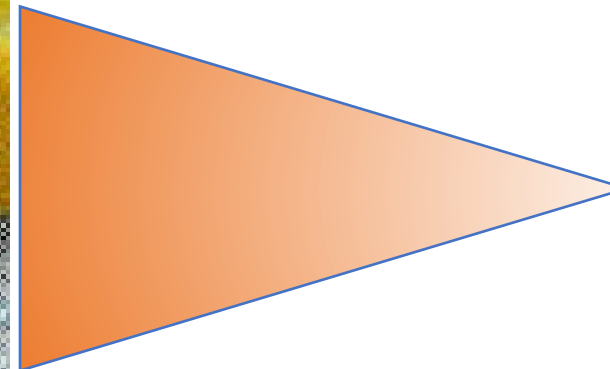
DIN 16598:2021  
 ISO/IEC: 202x

The solution  
 System Identifier for ASC Dis:



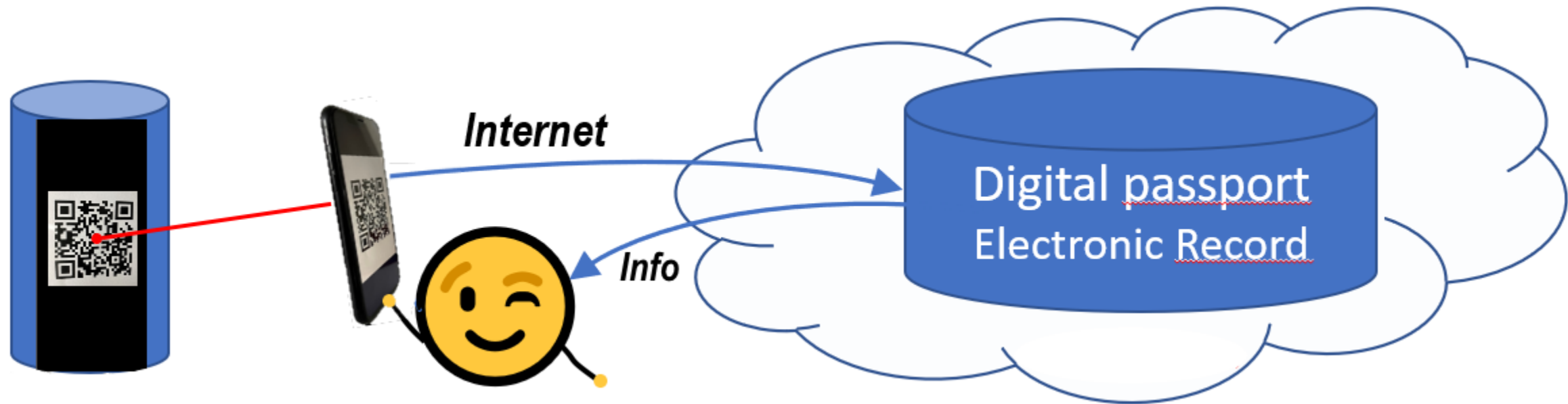


# Trend: Smartphone



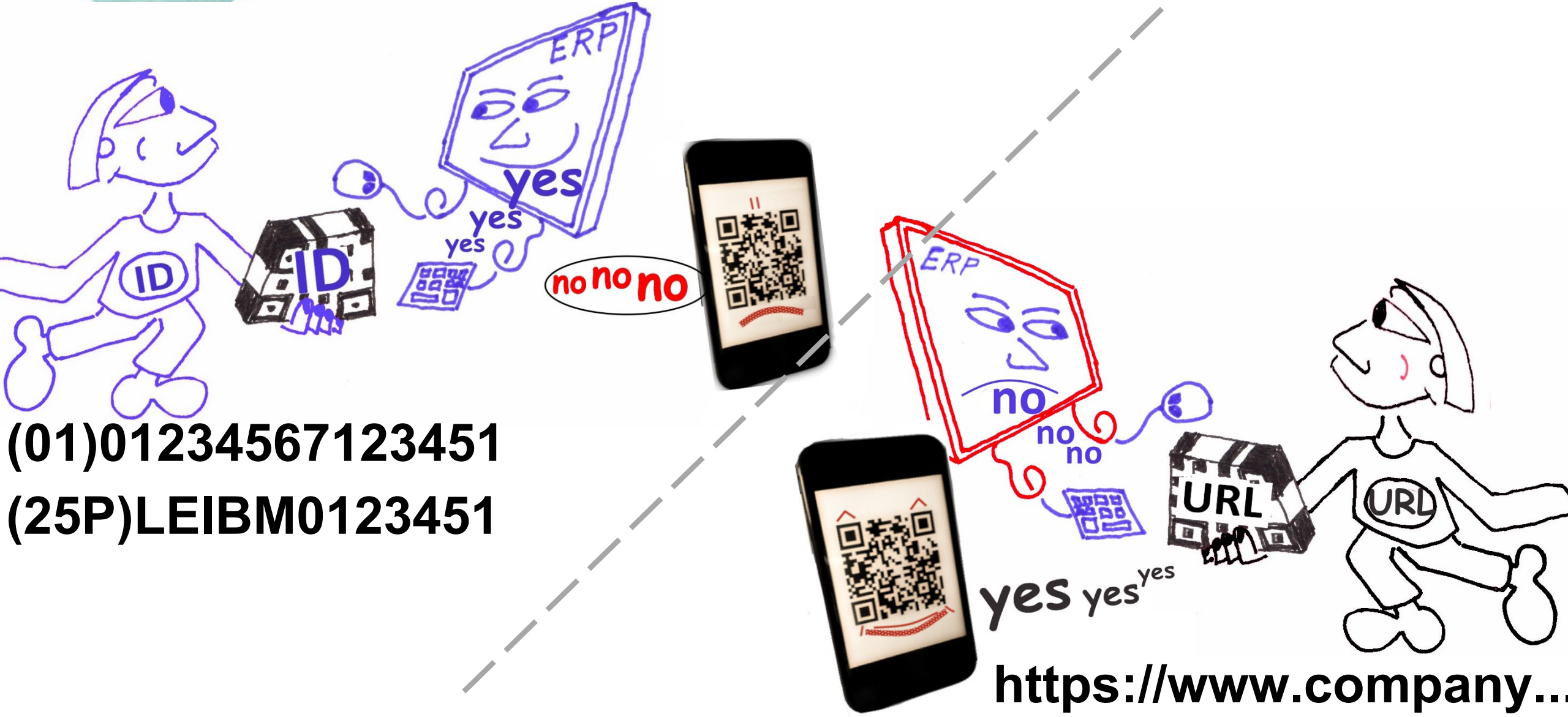
# Application development

e.g.: Digital Product Passport (DPP):  
**PRODUCT ID + PRODUCT INFO**





# ID versus URL URL versus ID









**History is teaching us**  
**Development never stands still.**



# Questions & Comments







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Defining Today's  
Technology Standards;  
Empowering Tomorrow's  
Solutions.

**THANK YOU!**

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