

Intelligent Packaging



Stora Enso Intelligent Packaging Agenda



1.
**Internet
of things**
The ultra
connected
world

2.
RFID
Radio
frequency
identification

3.
**Intelligent
packaging**
Connected
packages for
smarter brands

4.
Demonstrators
Intelligent
packaging in
real life

5.
Our offering
One end-to-end
solution

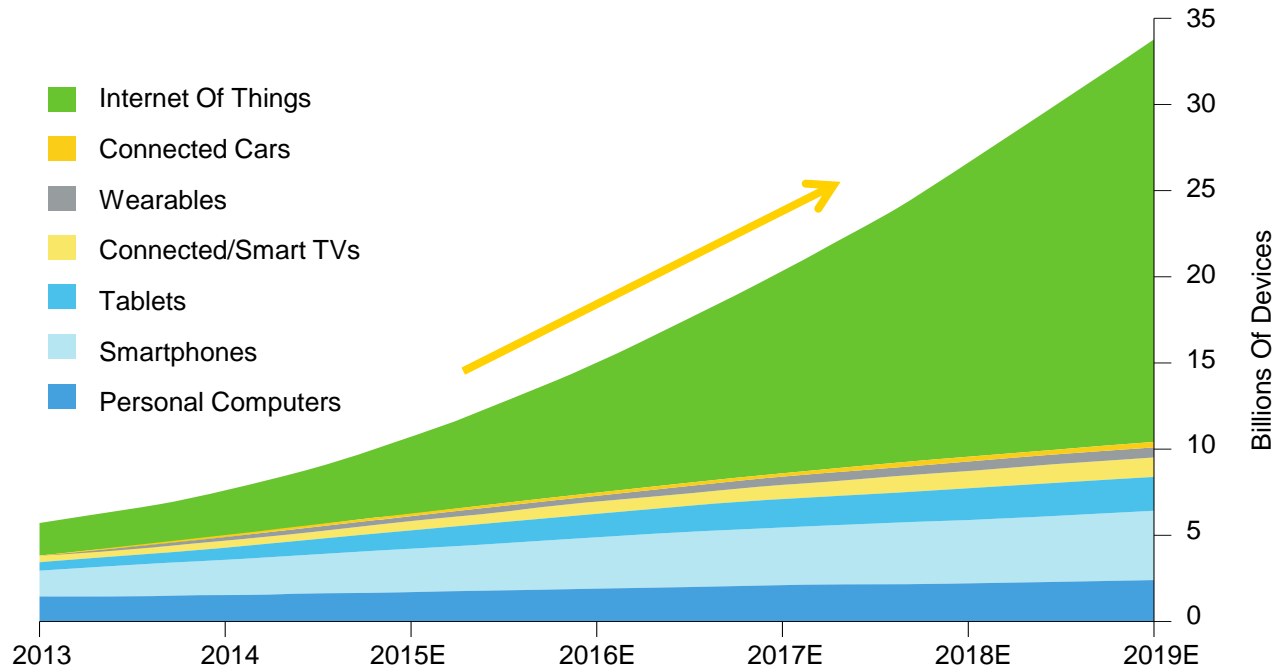


1. Internet of things
2. RFID
3. Intelligent Packaging
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The Internet of Things

35 billion connected devices in 2020



Source: BI Intelligence Estimates (2014)

- In 2015 → 1.4 billion smartphones shipped
- By 2020 → 6.1 billion smartphone users
- In 2015 → RFID tag market = \$11 billion
- By 2020 → RFID tag market = \$22 billion
- The IoT will add \$15 trillion to global GDP in the next 20 years.

Source: Forbes Magazine (Oct 27, 2015)

**ZARA ordered 500 million
RFID-chips in 2014**

ZARA

A photograph of a ZARA store at night. The building's facade is illuminated with a large, glowing 'ZARA' sign. The entrance is brightly lit, showing mannequins in various outfits. The store's interior is visible through the glass windows, and the overall scene is lit with warm, yellow light from the store's interior and the sign.

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What is RFID?

An aerial, high-angle photograph of a vast Amazon warehouse fulfillment center. The space is filled with hundreds of long, parallel aisles. Each aisle is lined with tall stacks of cardboard boxes on wooden pallets. The boxes are organized into neat rows, creating a grid-like pattern across the floor. The warehouse has a high ceiling with visible structural beams and large windows. The lighting is bright and even, highlighting the scale and organization of the facility.

- Radio-Frequency Identification (RFID) is the use of radio waves to read and capture information stored on a tag attached to an object.
- A **tag** can be read from up to several feet away and does not need to be within direct line-of-sight of the reader to be tracked.

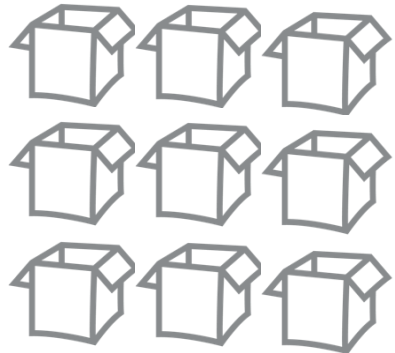
Photo: Amazon warehouse fulfilment center, Atlanta 2014,

RFID

NFC and UHF (or both combined)



NFC < 10 cm



UHF < 10 m



RFID

History of RFID



RFID

Advantages of Barcode vs. RFID



	Barcode / QR	RFID / NHS
Reading without line of sight	X	✓
Visual integration on product	X	✓
Read speed in production line	1 item at a time	up to 600 items/sec.
Read/write capability	X	✓
Tamper detection	X	✓
Security	X	✓
Connection to sensors, LEDs and sensors	X	✓

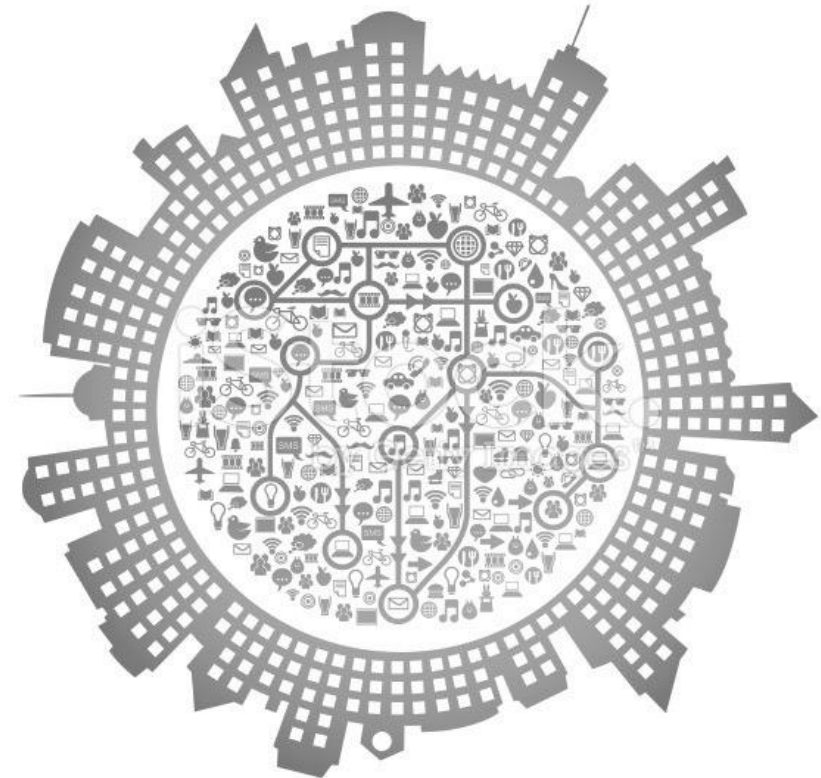
RFID

A global perspective



There are thousands of RFID deployments around the world every day addressing a global array of business applications:

- Retail supply chain
- Pharmaceutical supply chain
- Military supply chain
- Container tracking and management
- Baggage tracing and management
- Automated payment solutions
- Automotive and aircraft assembly
- Brand protection and authentication
- Connected products for consumer engagement



RFID

Retail leads the way



Supplychains in retail benefit dramatically from the new technology

- 15% higher sales from better on-shelf availability
- Ever-decreasing sales-periods of collections
- High level of SKU's
- What is where: products move in the store
- Easier and cheaper in-store and in-stock inventory processes
- Full supply-chain visibility and tracking
- Low cost solutions available for even small retail companies



100%
Inbound/outbound
inspection



25X
Faster inventory
checks



40%
Fewer empty
shelves

Source: IDTechEx, 2015



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Intelligent packaging

Key benefits



Consumer
Engagement



Brand
Protection



Supply chain
management

Intelligent packaging

Boost consumer engagement and repeat sales



Consumer
Engagement

Challenge

- Brand owners limited to one moment of interaction
- Generic mass-market communication
- Low customer retention /loyalty



Solution

- Individual marketing across new channels and surfaces
- Real-time consumer feedback
- Consumer behaviour analysis
- Improved repeat sales and brand loyalty
- Exclusive content information
- Consumer proof of authenticity

Intelligent packaging

Protect your brand and get perfect traceability



Brand
Protection

Problem

- Risk of theft
- Risk of copy infringement
- Loss of goods
- Risk of damaged products
- Low traceability
- Costly recalls



Solution

- Unit-level identification
- Perfect traceability
- Proof of authenticity
- Anti-counterfeiting
- Anti-tampering
- Grey market activity reporting
- Security breach attempt alerts
- Warranty claim management
- Easier recalls

Intelligent packaging

Automate supply chain efficiency and cut costs



Supply chain management

Challenge

- Tedious and inefficient inventory management
- Item by item scanning
- Just-in-time production
- Lag and delay in access to updated information
- Manual processing resulting in high costs and low efficiency



Solution

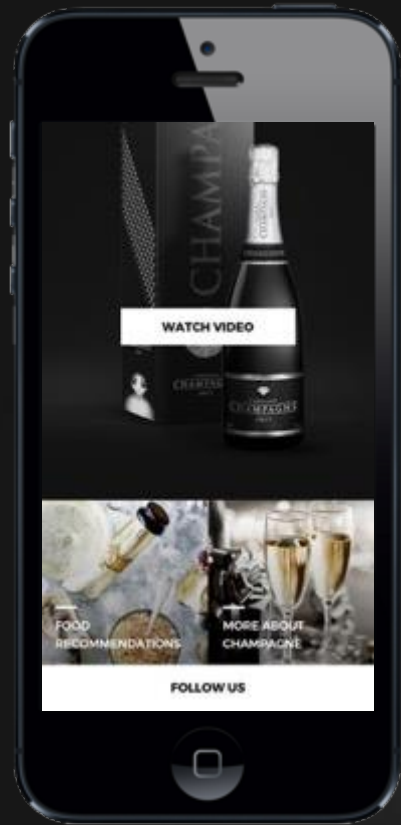
- Automated transactions
- Fast stock trackings
- Anti-theft
- Real-time information
- Real-time location
- Reduction of errors
- Condition tracking (eg. cold chain)
- Data for process optimizations
- Dramatic cost savings due to faster and more efficient processes

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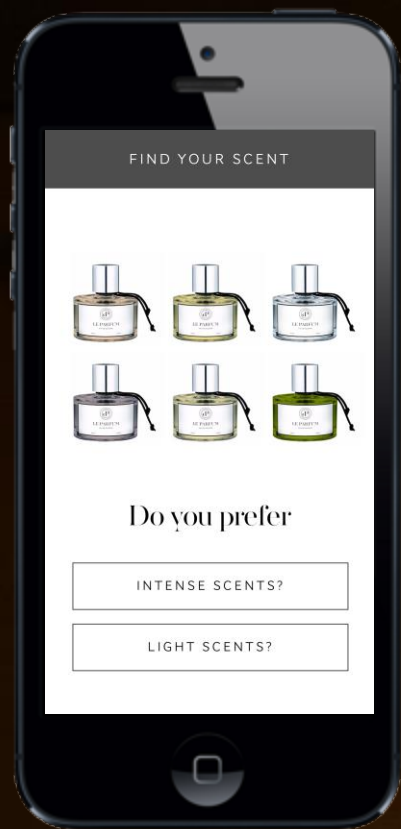
Demonstrators Chocolate



Demonstrators Champagne



Demonstrators Perfume



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Our offering

A one-stop-shop solution



7. Preferred partner network

- Infrastructure design, reader installations, hardware and software
- Smartphone/Reader Applications (middleware) and softwares

1. Design of the intelligent package (readability, functionality, security, placement)

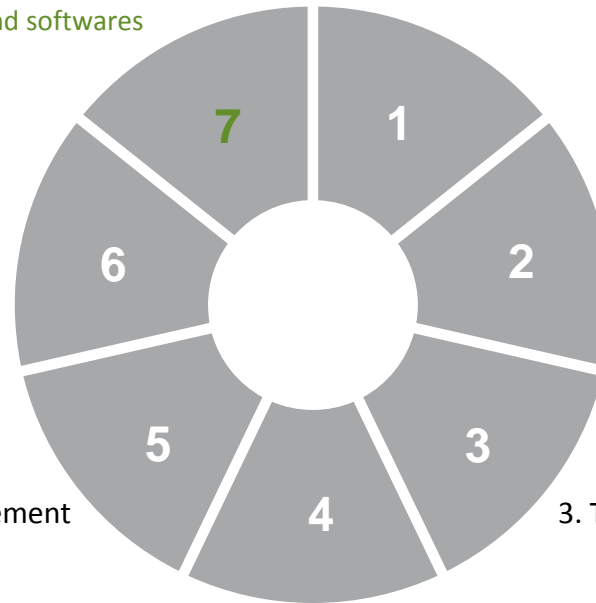
6. Data analytics and Dashboards

2. Tag design, selection and performance assurance

5. Cloud, connectivity, data collection and management

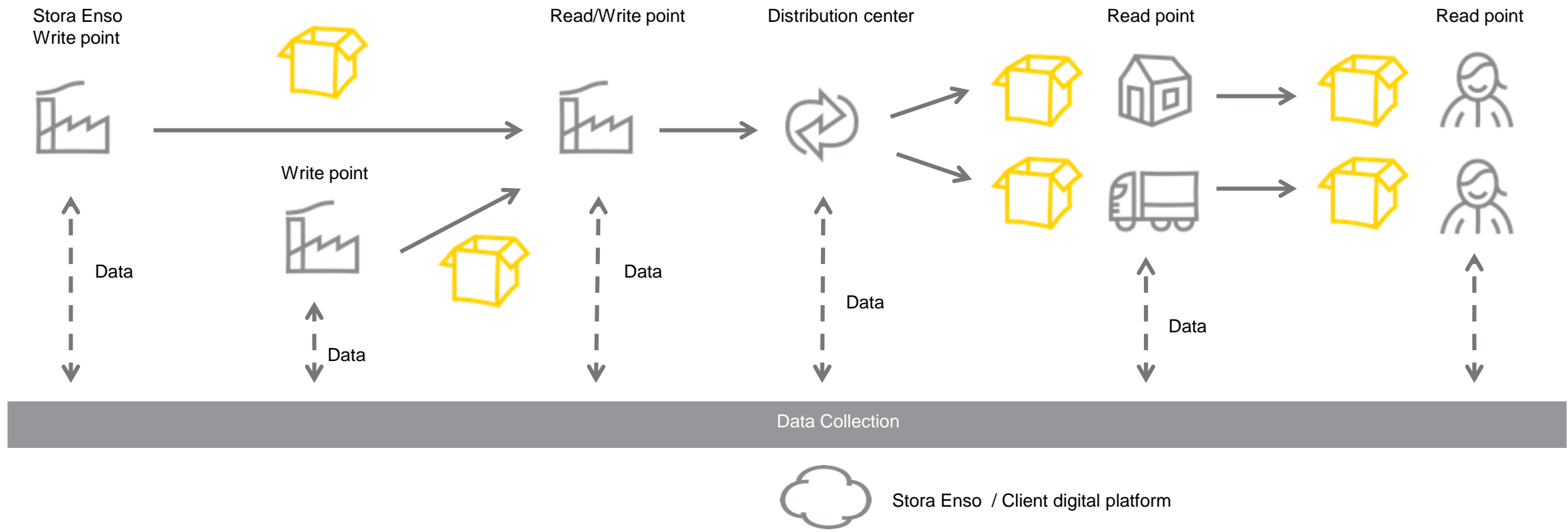
3. Tag encoding and data delivery to cloud

4. Integration process, converting and quality assurance services



Our offering

A one-stop-shop solution



Our offering

From here to there



1

Business case
selection/definition

Joint workshops
with Stora Enso

2

Solution design and
conceptualization

Site survey

Proposal and approval

3

Proof-of-concept

4

Non-commercial or
commercial pilots

5

Commercial roll-out



Thank you!