



Intelligent Packaging

**Simo Siitonen, Project Manager,
Stora Enso Intelligent Packaging Flagship**



COST is supported by
the EU Framework Programme
Horizon 2020

THE RENEWABLE MATERIALS COMPANY

Growth story.

World's oldest company goes digital



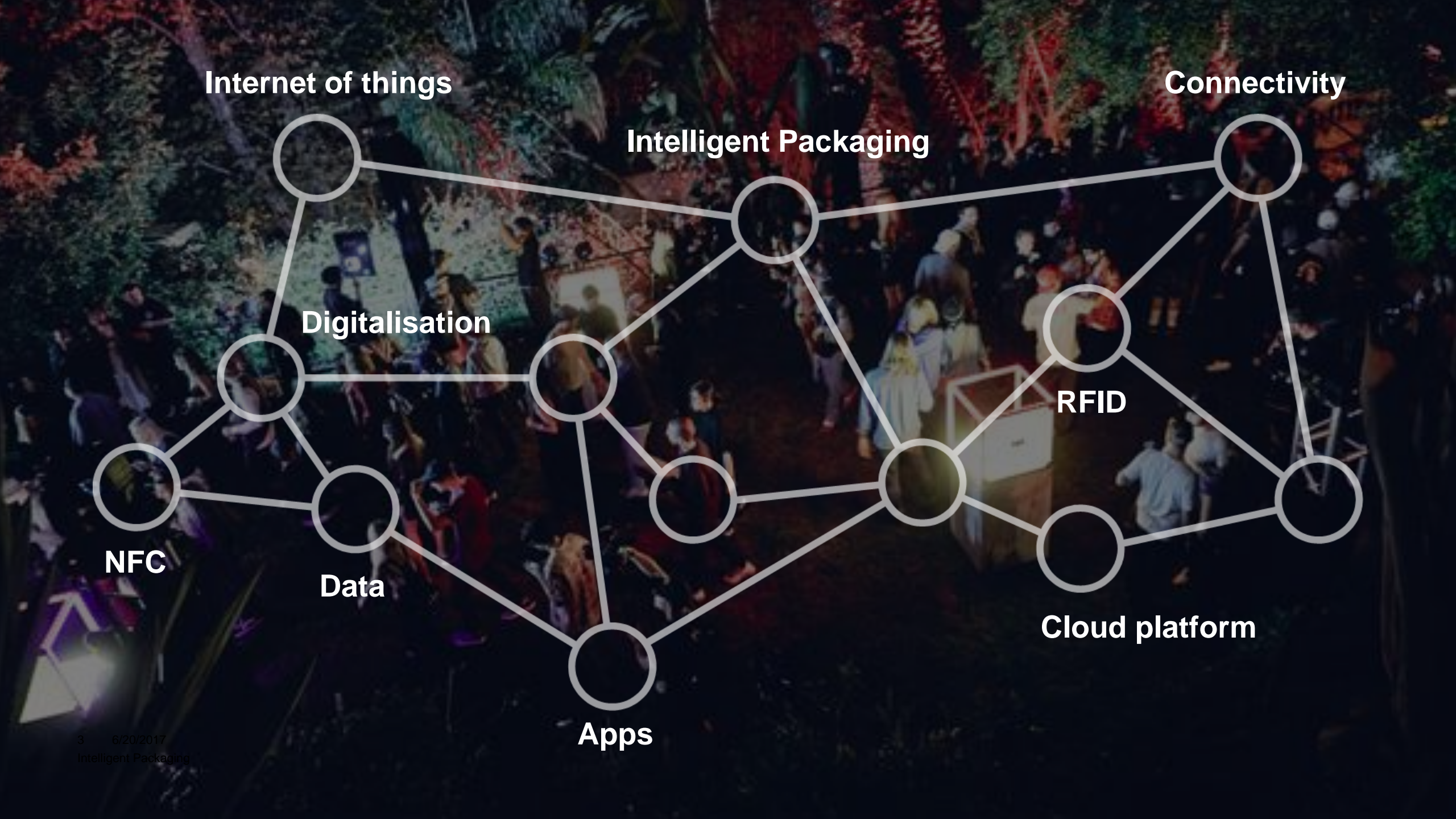
IoT. Driving internet connectivity to all packages. Renewing several business functions and foster digitalisation in packaged goods.

Packaging business becomes largest profit area within Stora Enso. Ranked as global #3 in packaging industry by size.

Rethink! Transformation from paper to renewable materials company 2006-2016.

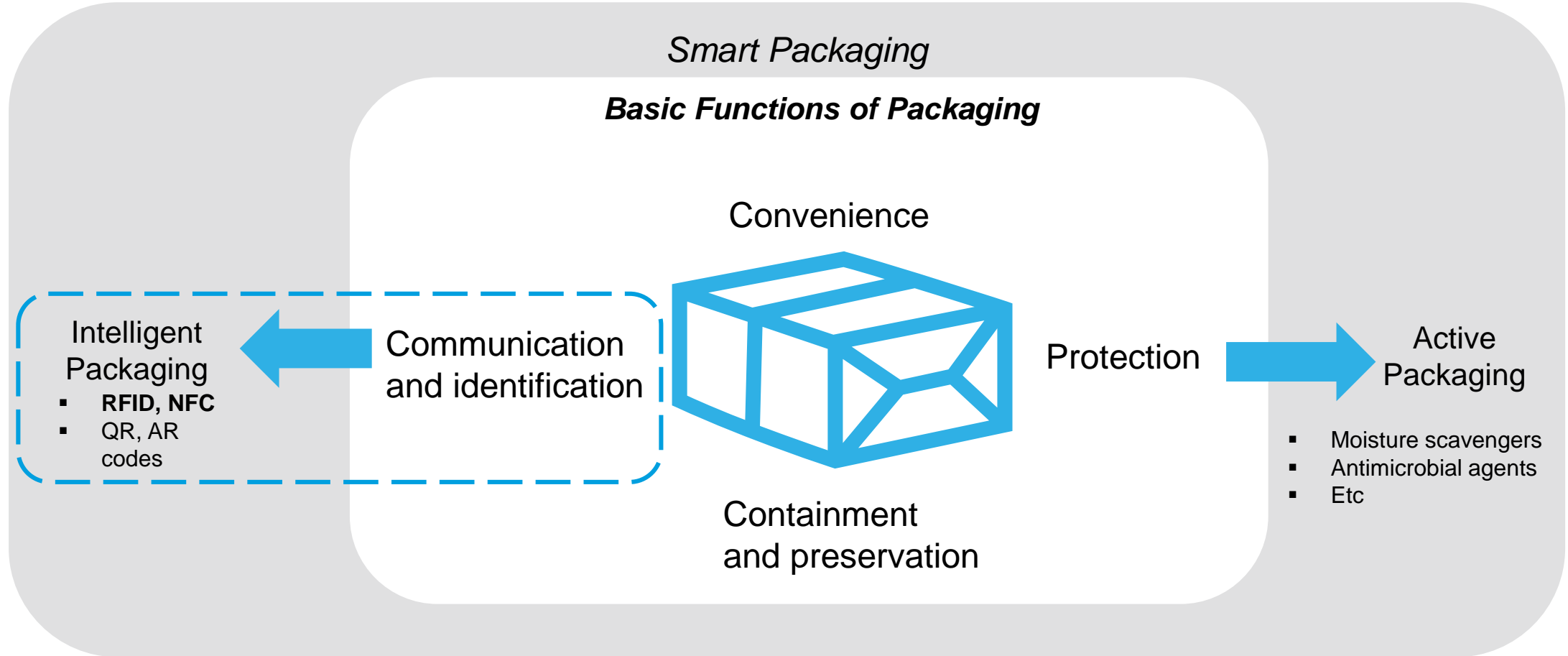
Founded
in 1288
as Stora AB

THE RENEWABLE MATERIALS COMPANY



Intelligent Packaging

- Intelligent Packaging is an **extension of communication function of packaging**
- Our Intelligent Packaging is with **RFID (NFC and UHF)** technologies



**2013-2015 ZARA has deployed over
billion RFID-tags**

ZARA

A photograph of a ZARA store at night. The building has a modern, dark facade with a large, illuminated 'ZARA' sign in white capital letters. The entrance is brightly lit, showing the interior with clothing racks and mannequins. The windows are also lit, displaying various outfits on mannequins. The overall scene is a well-lit, modern retail environment.

Latest technology and market developments

RFID market development example – Macy's

“men's and women's undergarments, men's slacks, denim apparel and women's shoes”

“all lines of businesses at its stores, except for jewelry and cosmetics.”

“all items in every store tagged”

Macy's Inc. to Begin Item-Level Tagging in 850 Stores

The company plans to RFID-enable its Macy's and Bloomingdale's stores in 2012, and will tag garments most often replenished—accounting for about 30 percent of the retailer's sales.

By Claire Swedberg

Tags: Apparel, Inventory / Warehouse Management, Manufacturing, Retail

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Sep 28, 2011—By late 2012, all Macy's and Bloomingdale's locations will be equipped with [radio frequency identification](#) technology, in order to [read item-level](#) tags on garments and personal items sold at the stores. Macy's Inc., the company that owns both brands, announced today that its rollout of [item-level](#) ultrahigh-frequency (UHF) [Gen 2 RFID](#) tags for inventory tracking was the result of successful pilots of the technology conducted over the past several years, at a handful of East Coast stores and furniture and bedding distribution centers. Macy's Inc. operates 810 Macy's department stores throughout 45 U.S. states, as well as in the District of Columbia, Guam and Puerto Rico, and 41 Bloomingdale's stores across 12 states.

Since late 2008, the company has been testing [RFID](#) technology by reading tags on garments, according to Bill Connell, Macy's Inc.'s senior VP of logistics and operations. Initially, he says, the technology was tested at a Bloomingdale's location in New York City's SoHo neighborhood, at which time the store's inventory speed and accuracy were compared against those of another control store at which no [RFID](#) tags were applied (see [Bloomingdale's Tests Item-Level RFID](#)). The pilot was then expanded to include seven additional stores and six distribution centers. According to the company, the testing found that inventory accuracy—knowing which goods were located at which specific spot—was raised to 97 percent thanks to the [item-level](#) application of [RFID](#) tags, as well as the reading of those tags for inventory cycle counts, both within stores and at DCs.

With the permanent rollout of [RFID](#) at all Macy's and Bloomingdale's stores, suppliers will be asked to apply [passive UHF](#) tags to “replenishment items”—products regularly stocked, and automatically resupplied when sold to customers, and accounting for approximately 30 percent of Macy's Inc.'s sales. The items to be tagged will consist of size-intensive replenishment categories, such as men's and women's undergarments, men's slacks, denim apparel and women's shoes.



27B\$

Macy's to RFID-Tag 100 Percent of Items

Speaking at last week's [RFID in Retail and Apparel](#) conference, Bill Connell, the company's SVP of logistics and operations, said Macy's aim is to have all items RFID-tagged at the source by the end of 2017.

By Mark Roberti

Tags: 2018, Apparel, Retail, RFID Journal Events, Supply Chain

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Oct 12, 2016—Speaking at [RFID Journal's](#) second annual [RFID in Retail and Apparel](#) conference and exhibition, held last week in New York City, Bill Connell, Macy's senior VP of logistics and operations, revealed that his company plans to have 100 percent of all items in every store tagged by the end of 2017. To achieve this goal, the retailer is asking all of its product vendors to supply merchandise already fitted with [passive ultrahigh-frequency UHF RFID](#) tags based on the [EPC Gen 2](#) standard.

“We still have a lot of work to do with our suppliers to get that joint commitment to apply tags at source,” Connell said. “But we are fully gassed and continue to expand [our use of [RFID](#)]. We are now moving into additional use cases that are enabled because of [RFID](#) and, equally important—because of the availability of accurate information—on a very quick basis.”



Bill Connell, Macy's SVP of logistics and operations

In 2015, Macy's announced that it was expanding its [RFID](#)-tagging deployment to all lines of businesses at its stores, except for jewelry and cosmetics. These two categories were not a focus since there were challenges finding tags that worked effectively and would not negatively impact the items' presentation. “We are now working with [GS1](#) and others to find solutions [for these categories],” Connell said, “both in the technology and the presentation techniques to bring those categories of business into the fold as well.” However, he noted, there is a chance that Macy's will not be able to resolve those issues in time to meet the end-of-2017 goal.

By the end of this year or the start of 2017, Connell told attendees, more than 60 percent of all goods at most of Macy's stores will be [RFID](#)-tagged and cycle-counted monthly via handheld [RFID](#) readers. Macy's had published the tagging requirement in its vendor standards manual, he said. Now, the retailer is working with suppliers to get them to [tag](#) merchandise at its source.

There is a “much greater acceptance and greater understanding of the benefits” among suppliers, Connell explained. “There is a momentum that suggests to us that we are pretty much at that tipping point.”

Source: RFID Journal October 2016

30% 2012

60% 2016

100% 2017

THE RENEWABLE MATERIALS COMPANY

**From customer experience point of view,
online and offline should contribute to same experience.**



WEB



PHYSICAL LIFE

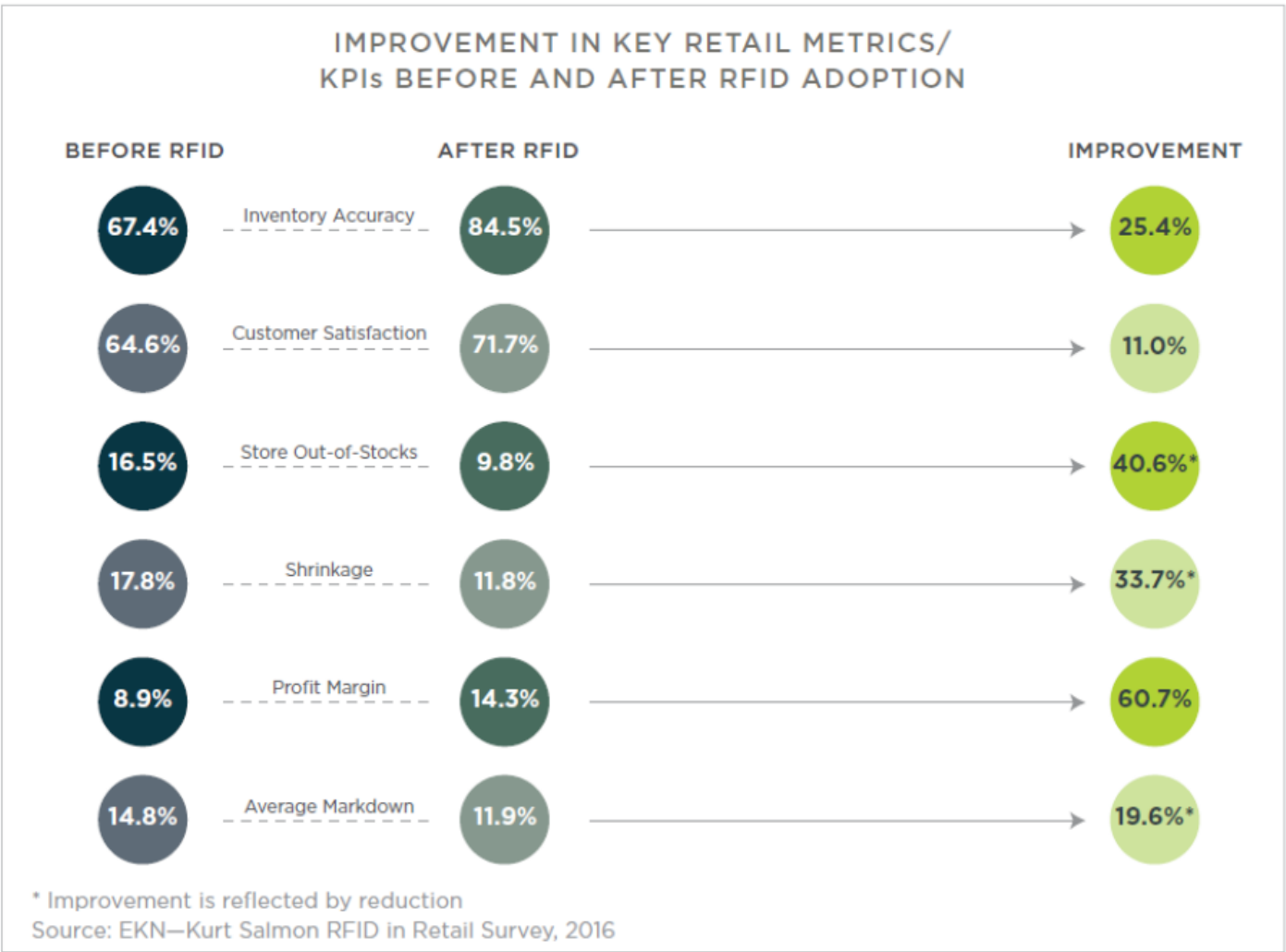
DATA

EXPERIENCE

CUSTOMER JOURNEY

INNOVATION

Not just experience - Positive impact on business



Application is Done in Collaboration with Specialist Planning Firms



Owner of a brand,
product and
an opportunity.
Business acumen!

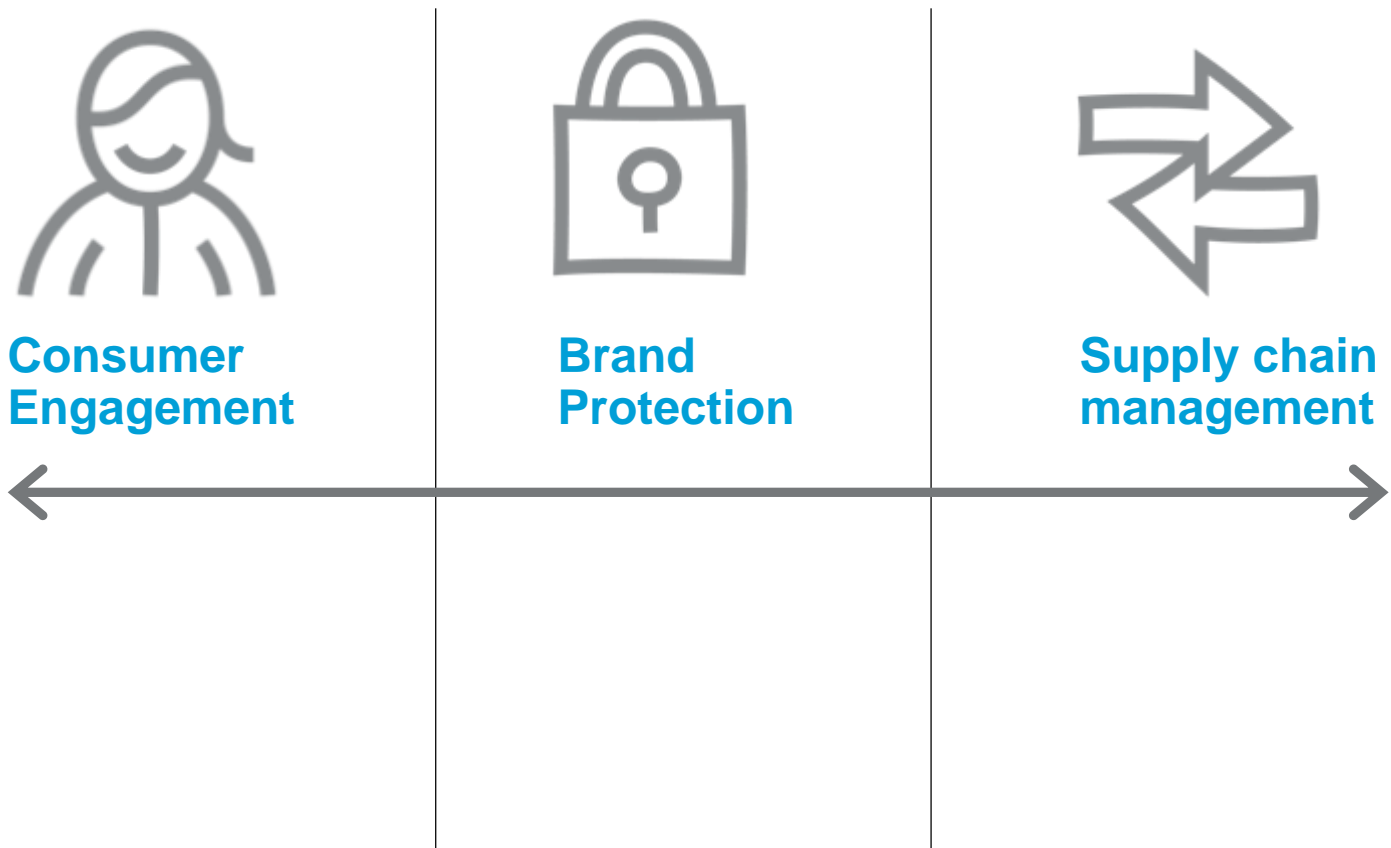


Creative Agencies to design interactions, journeys, messaging and create digital services. Imagination!

Management Consultancies to plan and calculate savings in Supply Chain operations. Specialist skills!

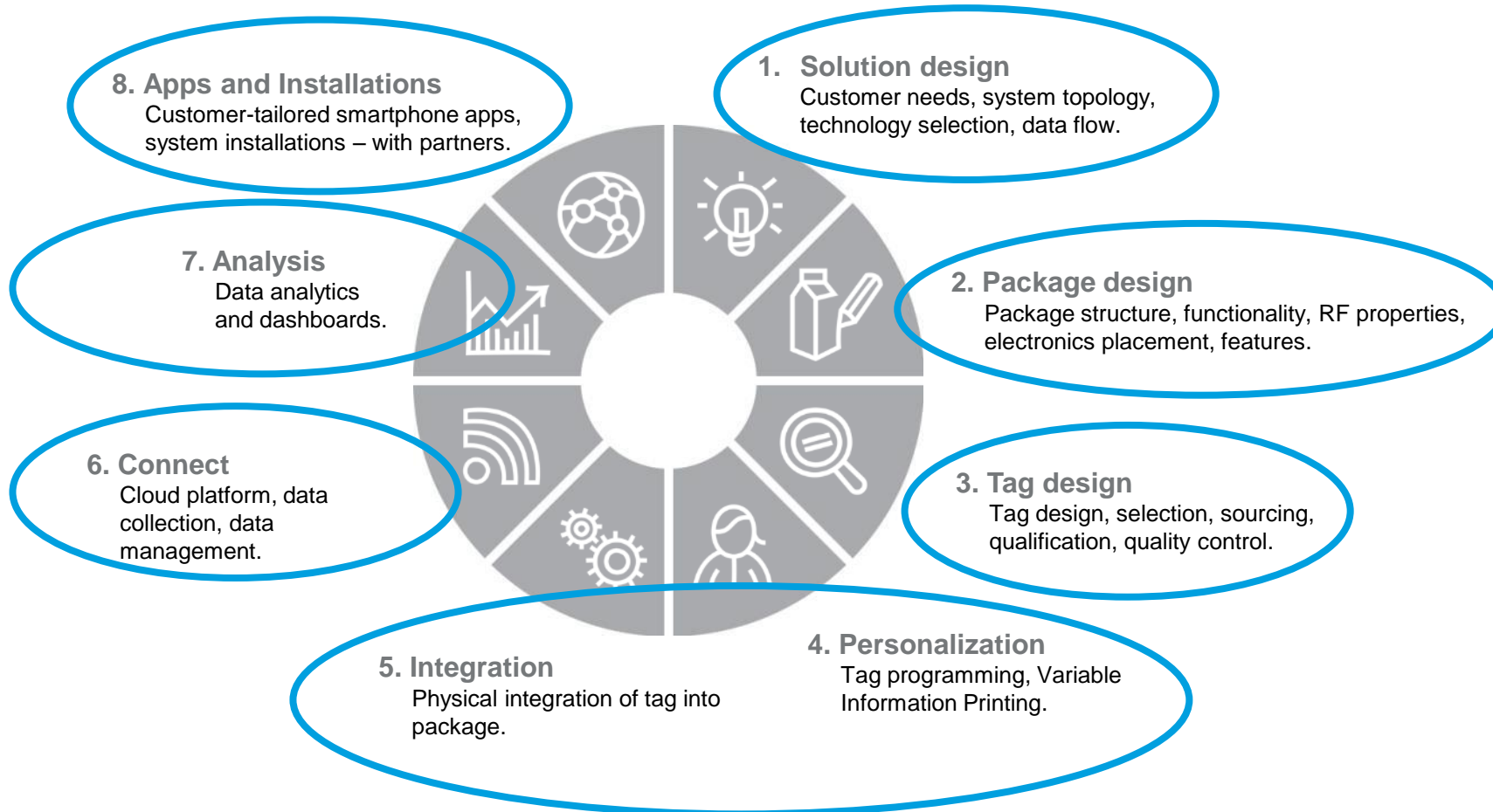
Capability to connect product, data and offline channel. Industrialisation!

Intelligent Packaging



Our offering

A one-stop-shop solution



Tag embedding Integration System



Integration system is crucial step change enabler in automated sleeve tagging, data management and secures rapid commercialization for the SE Intelligent Packaging

Tag Integration System

Applicator

Bad tag removal

RFID reader, writer
and tester

Visual identifier
Barcode etc.

Graphical user
interface

Remote hosting by
Stora Enso

Data management

ID collection and
option for SKU match

Quality control



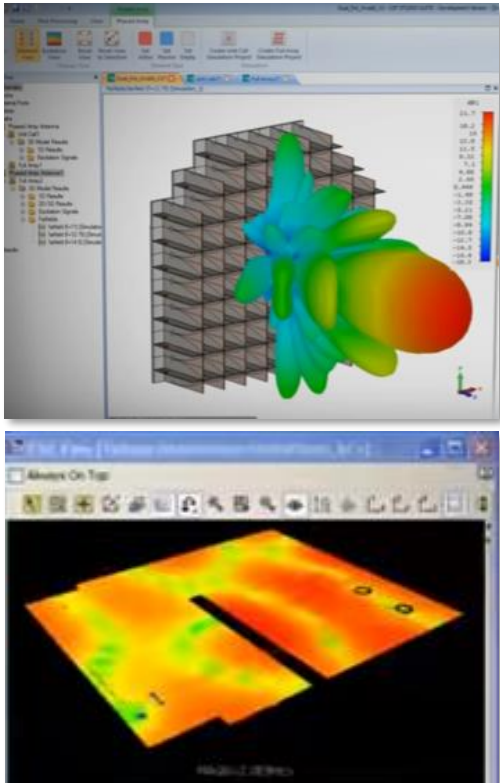
Sheet Integration System.

Offline or online, depending on the use case

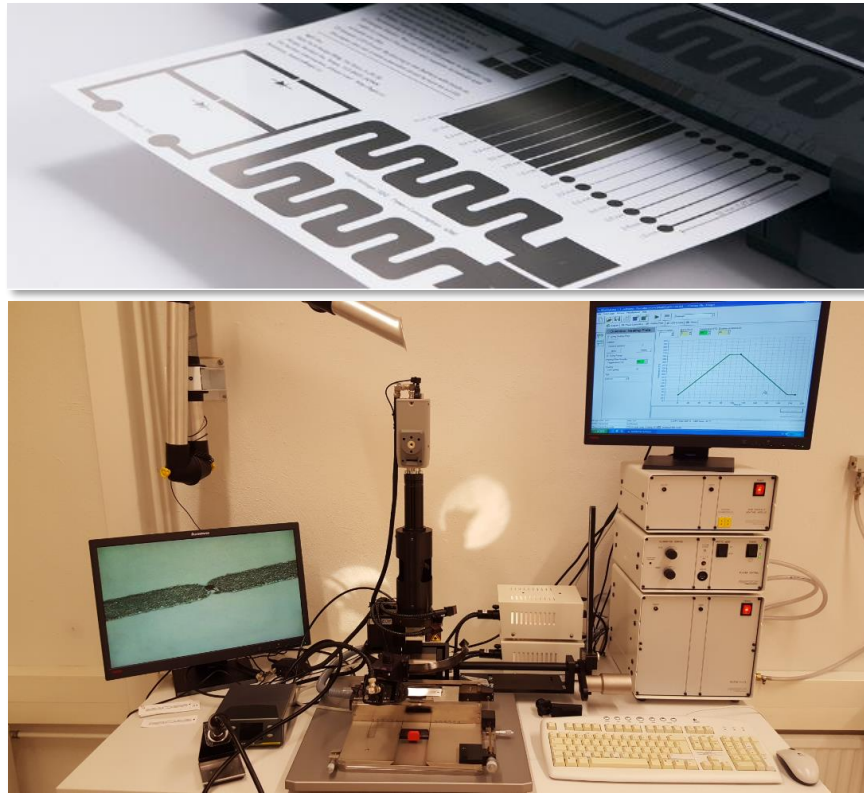
Capabilities

Tag Design

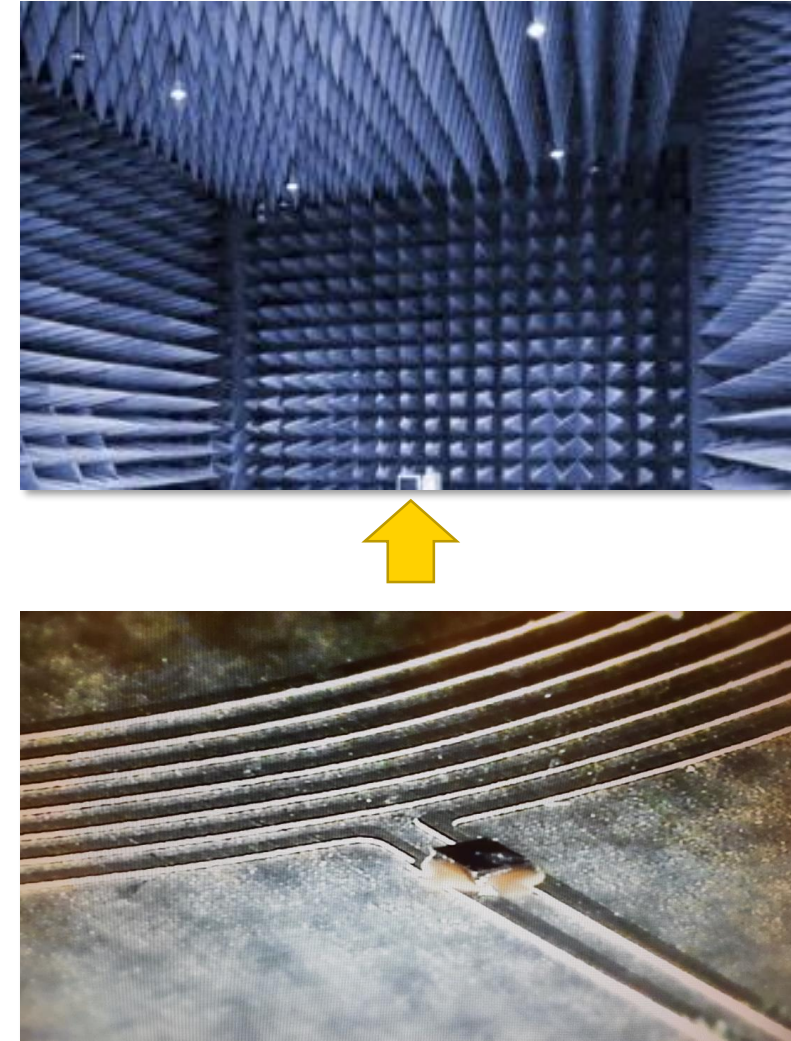
Tag Design:
Antenna Simulation
Software



Tag Prototyping:
Antenna Fabrication
Laboratory IC Assembly



Tag Characterization:
Full-sized RF shielded
Anechoic Chamber



Capabilities

Tag Sourcing & Qualification



Tag Sourcing:

- Network of >100 vendors
- 5-10 active
- Cumulative 30 years experience in tag manufacturing industry



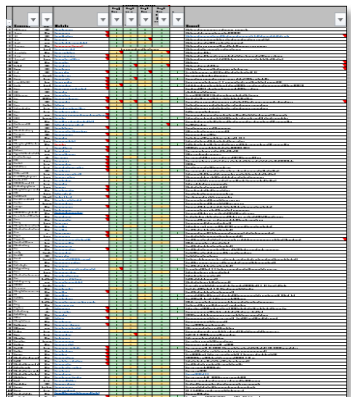
Tag Qualification: Design

- Application Test Equipment



Tag Qualification: Manufacturing Quality

- 100% reel-to-reel parametric testing
- Temperature & Humidity stress tester
- Tag bending stress tester
- Failure Analysis equipment



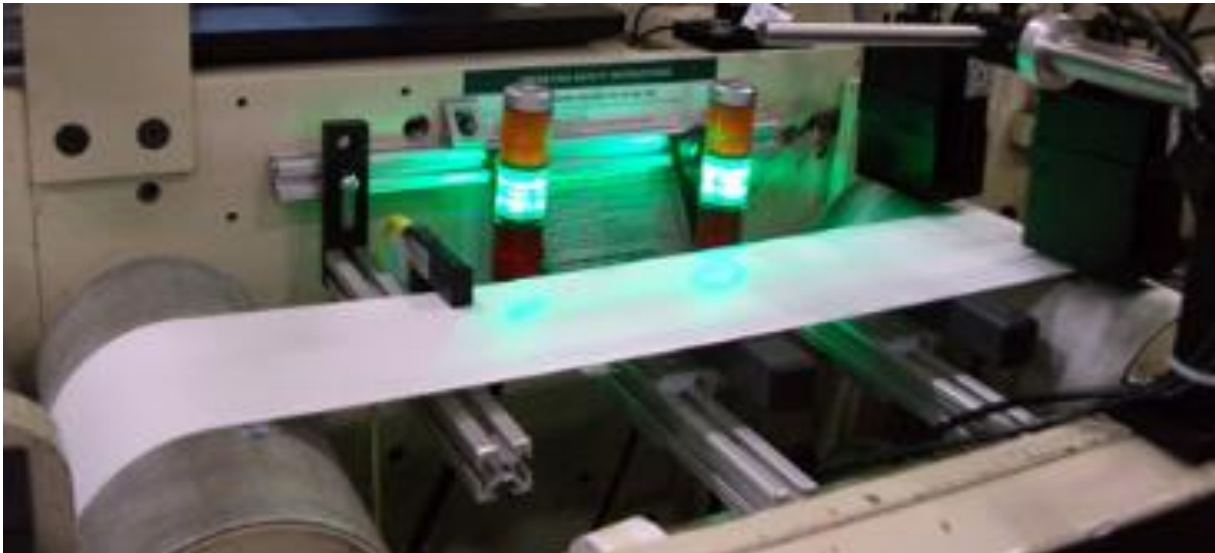
Capabilities

Tag Testing and Encoding



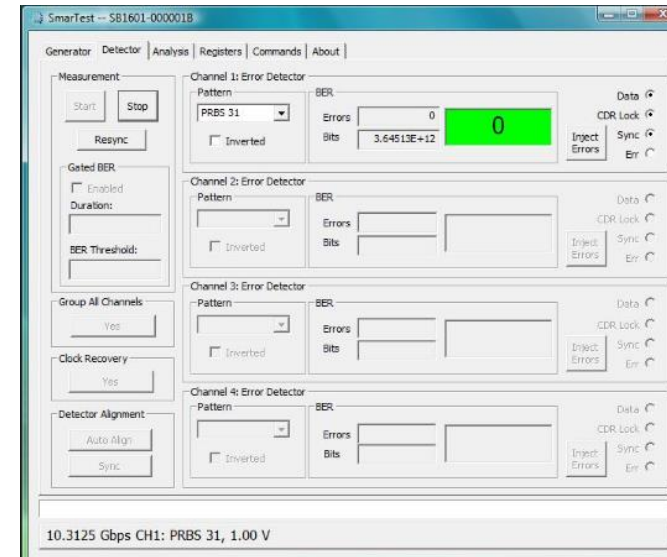
Tag Testing and Encoding:

Testing and Encoding recipe creation (remote) and upload
UI for local operator
100% parametric testing of UHF & NFC tags
Encoding of UHF & NFC tags
Defect tag handling (marking, sorting).



System:

HW and SW
Applicable to various production lines
Test Data upload to cloud, global operation
Replications and back-ups
Remote monitoring



Intelligent Packaging Digitalizing your business throughout the supply chain



Manufacturing



Inventory

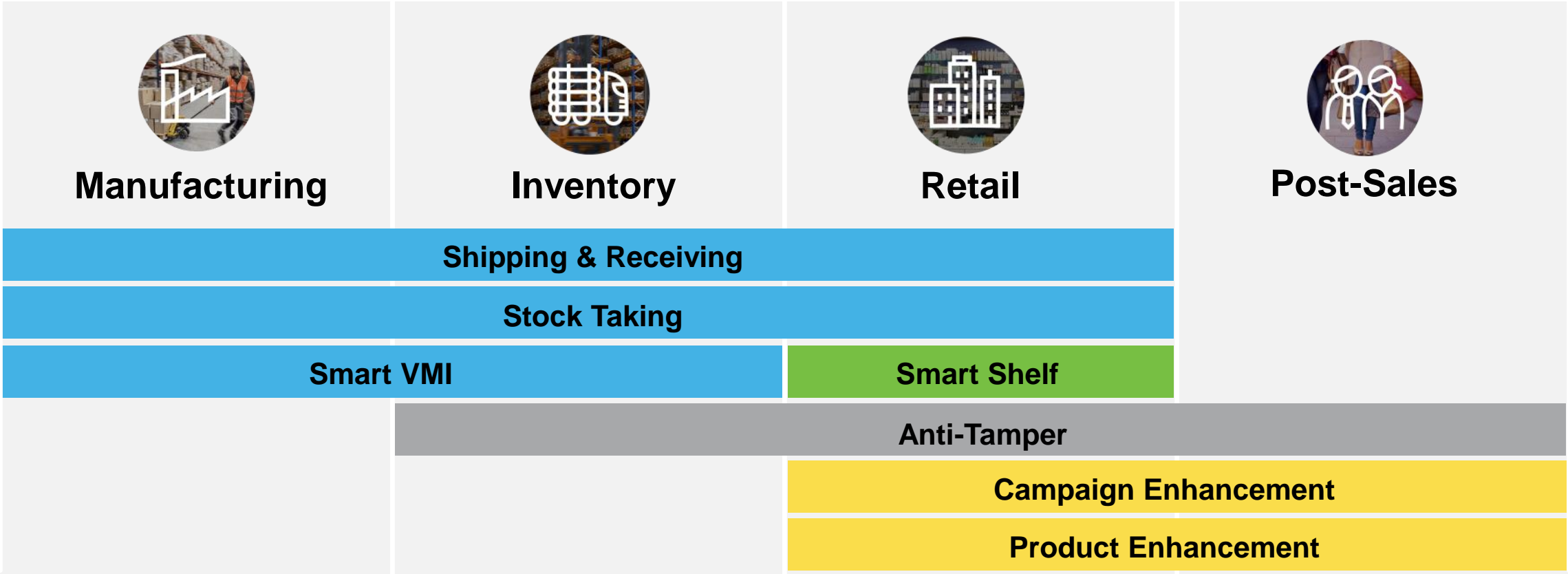


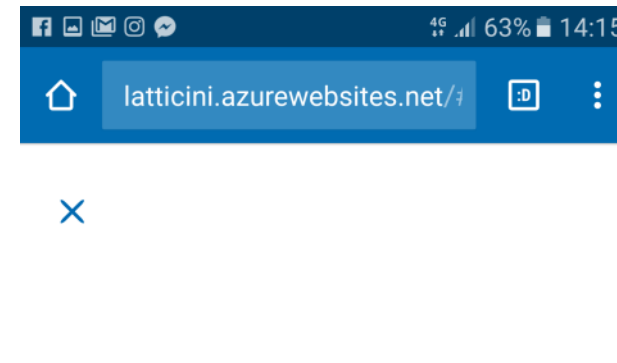
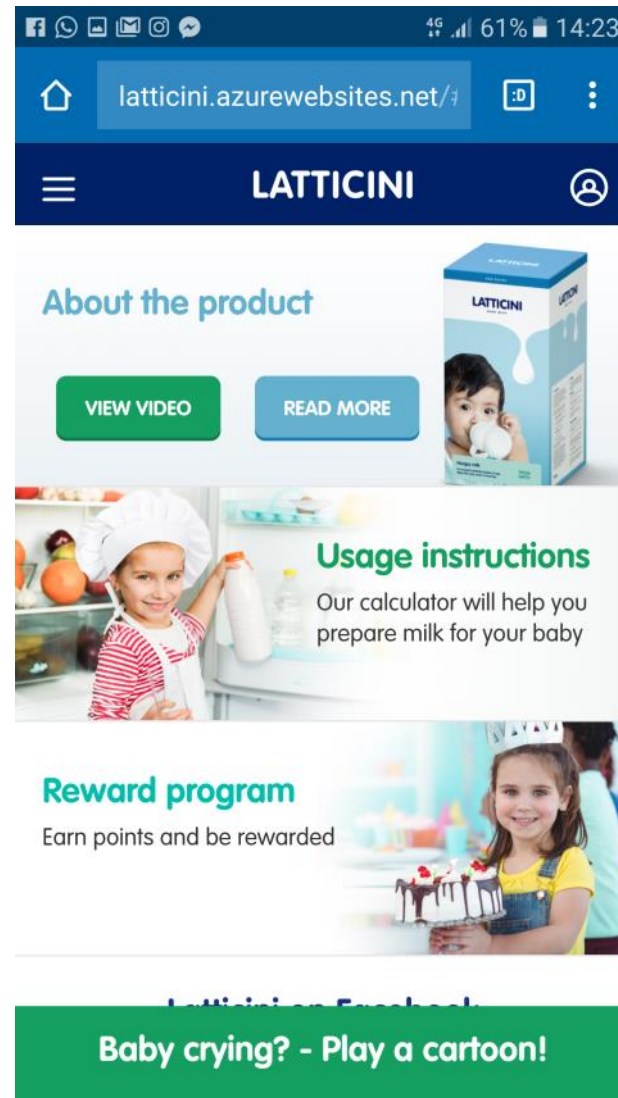
Retail



Post-Sales

Solution Portfolio







Latticini first milk

Inspired by 40 years of research, our team of scientists have developed Latticini hungry milk. Suitable from birth, it is nutritionally tailored for babies who are combination feeding or not being breastfed.

Latticini baby milk powder

Baby milk powder Latticini Baby is produced in Finland on high-end manufacturing equipment where every step is carefully controlled, from milk gathering at the own farms to the packaging and shipping them into shops. Best Finnish specialists has developed the Latticini Baby mixture using



Baby crying? - Play a cartoon!

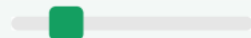


Usage instructions



Age of baby

2 weeks



Weight of baby

4 kg



Other important instructions

1. Wash your hands before cooking the mixture.

Baby crying? - Play a cartoon!



Reward program

After collecting 5 points, we will reward you with a free gift from Latticini.

Your status



Only 2 left to get the prize!



Baby crying? - Play a cartoon!



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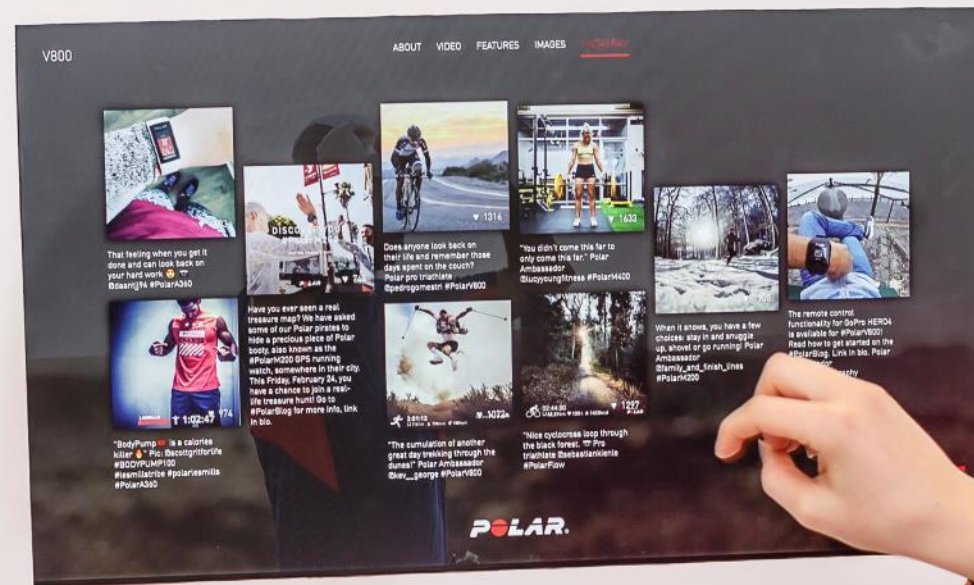
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Intelligent Packaging



Intelligent Packaging videos

Detailed: <https://youtu.be/2eqtHLa8Bgw>

More inspirational: https://youtu.be/5iZ_6rVNIAc

Thank you!

