



ASPIRE Pilots

Athens Information Technology





Agenda

- SENSAP Pilot
- STAFF Pilot
- PV-LAB Pilot





Sectors targeted

- Packaging and Logistics
 - SENSAP S.A.
- Logistics and Retail
 - Staff S.A.
- AspireRfid Middleware Demonstration
 - PV Lab





Objectives (1)

- To verify
 - Programmability
 - Lightweight nature
 - Scalability
 - Ease-of-use
 - Effective adaptation for mobile solutions
 - Low-cost
 - Reusability through modularity





Objectives (2)

- To correct problems
- To estimate real cost savings





Expected Outcomes (1)

- A set of evaluation metrics
 - Verifying that AspireRfid can support realistic pilot deployment
 - Ensuring that AspireRfid can lower the integration effort and cost associated with pragmatic trials





Expected Outcomes (2)

- A set of evaluation metrics
 - Measuring the advantages of AspireRfid from the perspective of the RFID integrators
 - Auditing the ability of AspireRfid to adapt to different use cases and trials scenarios
 - Perform a techno-economic analyses of the trials





The SENSAP Pilot





SENSAP S.A. (1)

- Headquartered in Athens, Greece
- Manufacturer
- Textile and fashion company
- Mechanic equipment and components for the packaging industry
- Factories in Balkan countries
- Central warehouse in Central Greece





SENSAP S.A. (2)

- Production activities in Mjaellon, Sweden
- Export in Bulgaria, FYROM, Albania





SENSAP Pilot

- Main objectives
 - An RFID enabled warehouse for pallet, carton and item level inventory
 - Automated handling of shipping and receiving procedures
 - Business utilization of the RFID dynamic data from two distant places





SENSAP Current Conditions (1)

- Hundreds of product codes
- Many kinds of material types
 - Liquids, steel, plastic
- Internal barcode system
 - In-line with a small ERP system
- 3 people responsible





SENSAP Current Conditions (2)

- Main problems
 - Inaccuracies
 - Manual inventory counting at least every 60 days





SENSAP Current Conditions (3)

- Main needs
 - Handle a growing number of items and item categories
 - Optimize product distribution
 - Monitor stock levels
 - Optimize ordering accordingly
 - Establish an accurate inventory process





Objectives

- Implement an RFID technology solution in a SME company with
 - significant sales activity
 - daily logistics procedures for incoming and outgoing products
 - monthly based needs for warehouse inventory.
- Prove that AspireRfid is flexible enough to cope with complex types of applications





Suggested Actions (1)

- Focus
 - An RFID enabled automated warehouse for pallet and carton level inventory
 - Complete observation and tracking of tagged items
 - Dynamic representation of SENSAP's warehouse with adequate accuracy
 - Business utilization of the RFID data.
 - Special handling for sensitive products
 - Temperature





Suggested Actions (2)

- AspireRfid installation with
 - Networked RFID readers
 - UHF tags
 - Network switches





Current IT Infrastructure

- A Computer/Network management Server
- An Application and Database Server
- Desktop PCs for the employees
- Laptops for sales and visitors
- Wi-Fi infrastructure covering all the facilities
- Barcode scanners and printers





Situation to be

- Tag items upon reception with RFID tags
- Replace
 - Existing barcode system with RFID
 - Manual processes with automated
- Re-engineer processes





Process Re-engineering (1)

- Ordering
 - Enter a Purchase Order (PO) into the ERP
 - Seek confirmation by the supplier on the availability and shipment of the products
 - Print RFID labels for the “confirmed” products





Process Re-engineering (2)

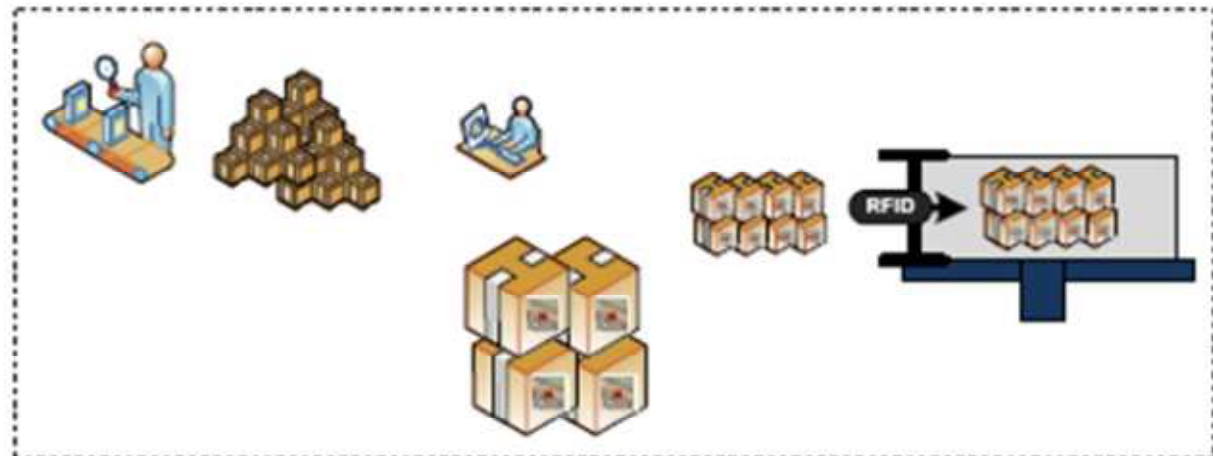
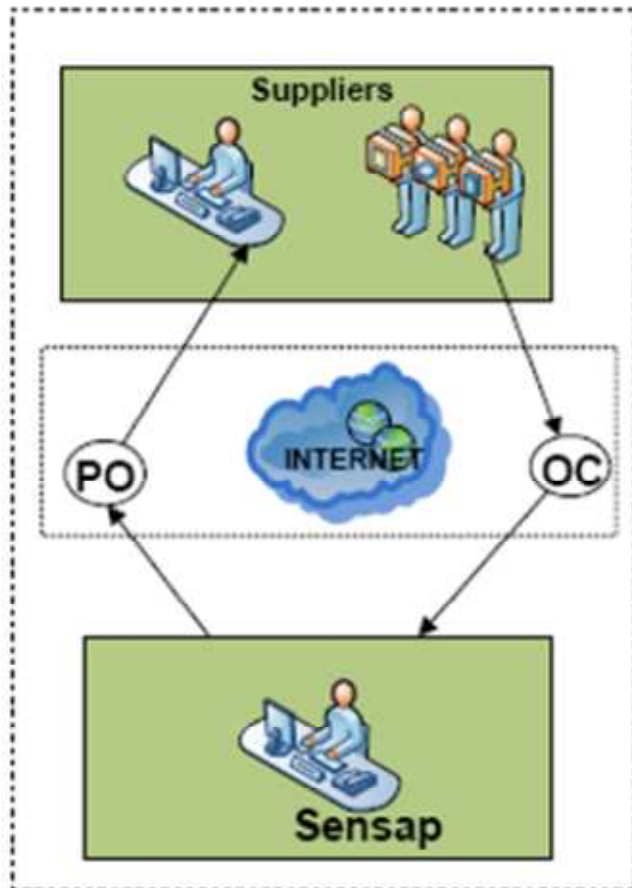
- Reception and Tagging of items
 - Receive items in a particular place of the warehouse (“tagging area”)
 - Count items
 - Verify that the packing list (PL) contains the “expected” items
 - Tag items at the pallet/package level, based on the RFID tags that will have been printed in the previous phase





Process Re-engineering (3)

- Moving items
 - At appropriate places, within the warehouse





Process Re-engineering (4)

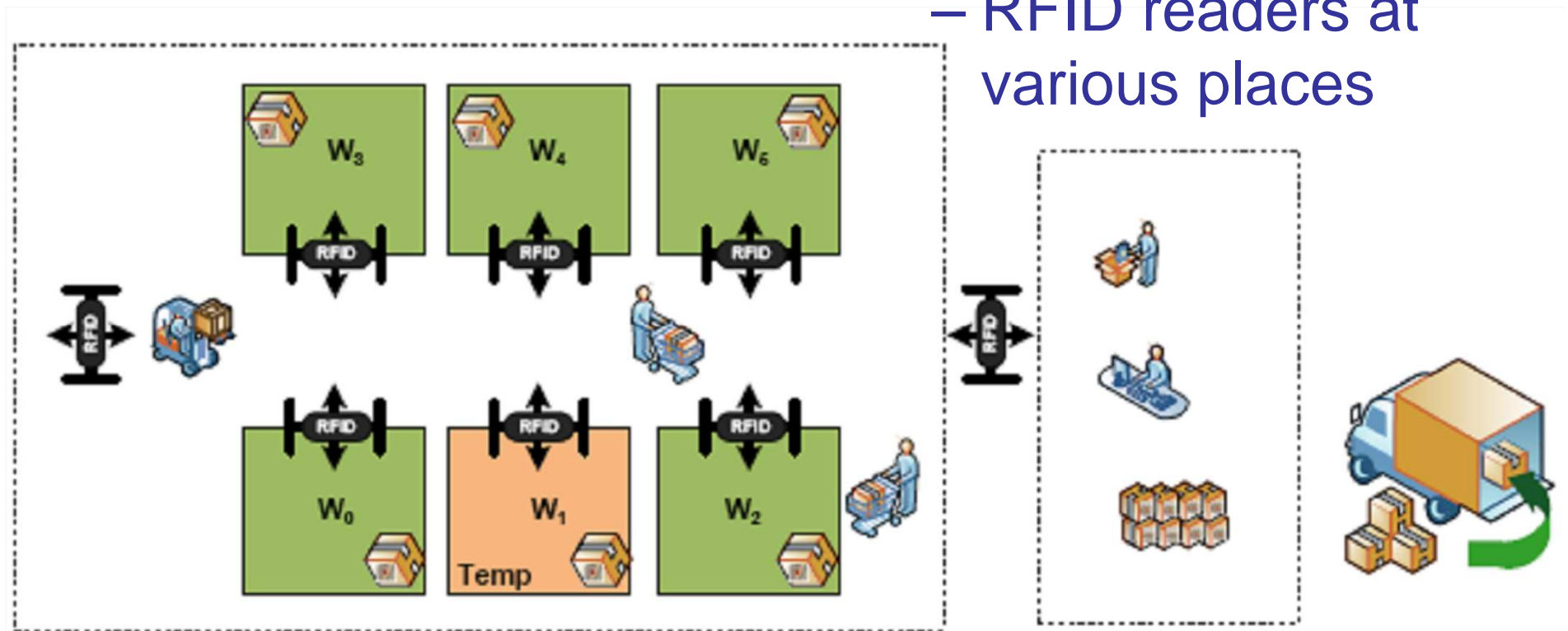
- Sales order fulfillment and shipment
 - Upon sales order reception, verify whether the products exist in-stock
 - Generate orders for out-of-stock items
 - Update the ERP system
 - Assemble ordered items according to a packing list (see [next slide](#))
 - Verify that collected items correspond to the ordered ones
 - Invoice and ship items





Physical warehouse space overview

- Assembling items
 - RFID readers at various places





Integration effort required

- Installing and configuring RFID read points
- Defining and configuring the ALE server
- Store business events based on filtered RFID products to the AspireRfid IS repository
- Connect this information to the ERP (post-processing of the events)
- Challenges
 - Integrating sensor data (temperature)





Modeling

- Warehouses and containers
 - Logical spaces as warehouses
 - Pallets, carton boxes and carts as containers
- RFID-enabled processes
 - Receiving
 - Moving products
 - Order collection
 - Order shipment
 - Inventory





Expected benefits

- Real-time inventory
- Temperature monitoring
- Immediately locate misplaced items
- More efficient utilization of warehouse space
- Automatic confirmation at dispatch
- Elimination of picking errors





The STAFF Pilot





STAFF S.A.

- Staff started as an apparel manufacturer in 1992
- Own label: “Staff Jeans & Co”
- Exports to more than 10 European countries
- Distribution center in Larissa
 - Stores and delivers more than 900,000 products annually





Pilot Context

- Two distinct trial deployments
 - Deploy RFID for the improvement of the *warehouse management* process
 - In the STAFF *retail* stores
- Tag products at the item level (in contrast with the SENSAP trial)





RFID and the apparel industry

- A happy case of RFID application!
 - No major disruptions to existing applications
 - Apparel items are RFID-friendly
 - Broad range of applications
 - shelf out-of-stock
 - shoplifting prevention



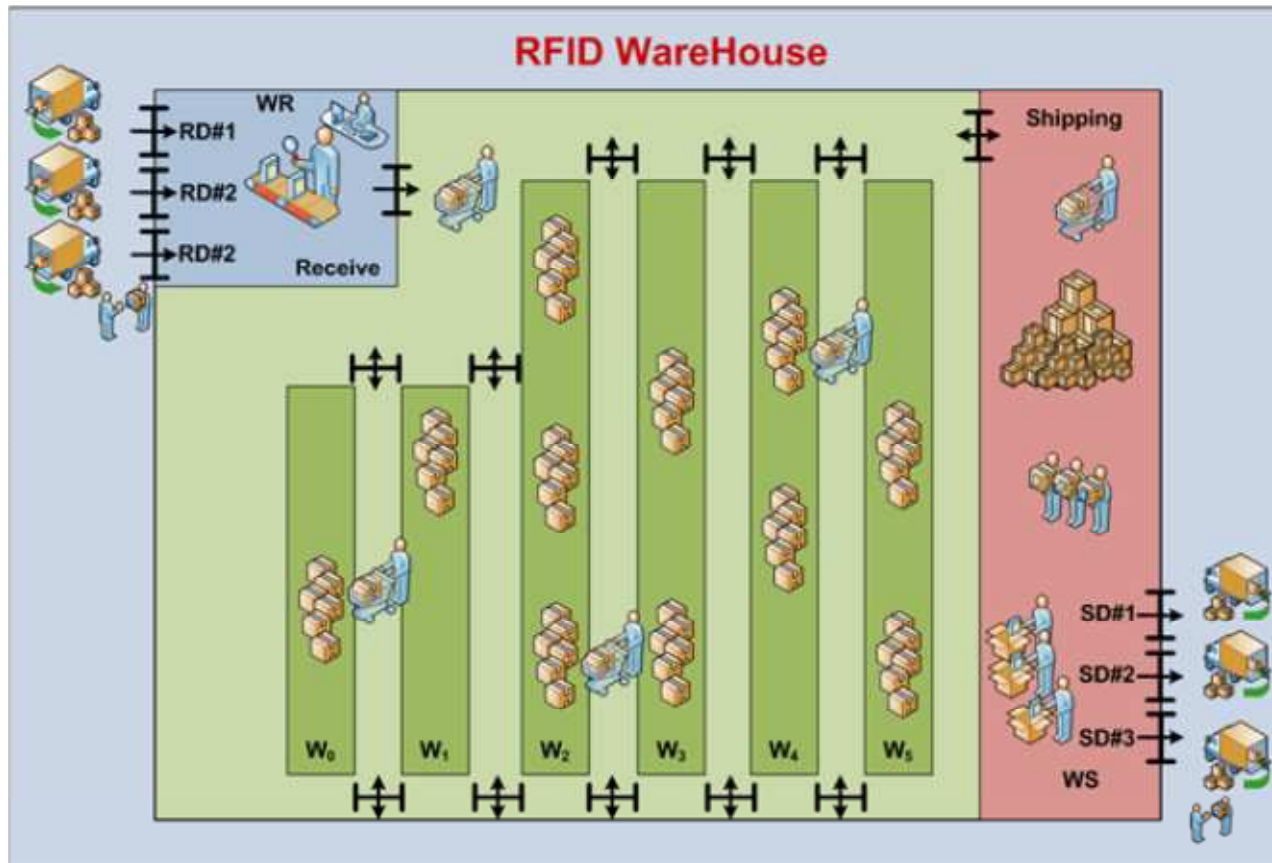


Warehouse Management Processes Overview (1)

- Three main procedures:
 - Receiving
 - Shipping
 - Inventory
- Simple modeling of the warehouse physical locations



Warehouse Management Processes Overview (2)



- Receiving
- Shipping
- Inventory



Retail Trial at STAFF

- Interactive system for retail sales
 - Touch-screens
 - Personalized marketing
 - Information
 - Propositions on related/matching items available
 - RFID-enabled loyalty card for e-shopping
 - Electronic checkout





Expected benefits (1)

- Warehouse management trial
 - Source tagging
 - Counter-counterfeiting and authenticity assurance
 - Particularly useful when dealing with returned items
 - Supply Chain traceability and real-time visibility





Expected benefits (2)

- Retail trial
 - In-store inventory
 - Security
 - Real added value
 - Increased competitiveness
 - Target customers mostly between 16-28
 - Acquainted and fascinated by new technology
 - Novel and effective marketing tools
 - Optimized customer satisfaction





Integration effort

- Tag products at the central warehouse
- Use existing broadband in retail stores to communicate with the central warehouse
- Periodically synchronize retail stores with the central warehouse





Steps for the integration

- Install and configure the RFID read points in the retail stores
- Use AspireRfid to
 - configure logical readers
 - configure F&C specifications
 - Establish mappings between business events and the IS repository
- Connect the EPCIS repository to the local repositories





The STAFF Pilot Overview

- Plus
 - Expected to generate ROI
- Minus
 - No tangible improvement for the pick-and-pack process
 - Relatively high consumables (passive EPC tags) cost compared to barcodes





PV-LAB Pilot





Traceability Center

- Nonprofit Organization
- Located in Valence, Drôme, France
- Neutral, independent “skills center”
- Supports businesses to
 - Improve internal operations, supply chain
 - Add value through innovation
- Use traceability as strategic part





Trial objectives

- Scope
 - Intra-enterprise Logistics Process Management Demonstration
 - Test different parts of the middleware
 - HAL, ALE, Filtering, BEG, JMX, EPCIS, ONS, IDE independently
 - Build preconfigured versions of the middleware, reusable by third parties





Trial description

- Four demonstrations
 - Pallet detection
 - Item detection
 - Pick & Pack
 - Retail Store





Pallet/Boxes Detection (1)

- UHF tags for pallets
- DF tags for each box on the pallet
- Operator reads tags with a Bluetooth handheld reader
- The application knows which boxes should be on the pallet
 - They are marked as “missing”





Pallet/Boxes Detection (2)

- The pallet is pushed towards the DF portal reader
- Boxes discovered are tagged as “present”





Pallet/Boxes Detection (3)



- Reception check on a pallet with a portal reader



Pallet Control Application (1)



- The operator reads the pallet tag
- The application displays boxes that should be on the pallet



Pallet Control Application (2)

Reception / Expédition V200

Pôle traçabilité

Ilot Réception / Expédition

Planche de destination

RAZ

Initialisation matériel

Connexion Handheld

Ferme

0580003a93c13	20/04/2009 09:21:55	Quai n°1
0580003a94c30	20/04/2009 09:21:55	Quai n°1
0580003a95917	20/04/2009 09:21:55	Quai n°1
0580003a96711	20/04/2009 09:21:58	Quai n°1
0580003a97d17	20/04/2009 09:21:59	Quai n°1
0580003a98d10	20/04/2009 09:21:59	Quai n°1
0580003a99767	20/04/2009 09:22:00	Quai n°1
0580003a9af1a	20/04/2009 09:22:24	Quai n°1
0580003a9b1ee	20/04/2009 09:22:24	Quai n°1
0580003a9c79c	20/04/2009 09:22:24	Quai n°1
0580003a9d041	20/04/2009 09:22:24	Quai n°1
0580003a9e474	20/04/2009 09:22:25	Quai n°1

Nombre de cartons détectés : 12

Éléments attendus

Identifiant Palette : 058000044ef3

<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0580003a99c33	0580003a9a16	0580003a9a399
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0580003a99f17	0580003a9c02e	0580003a9c266
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0580003a99e33	0580003a95e67	0580003a9c19e
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
0580003a9a030	0580003a9a041	0580003a9a04e
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
0580000a0711	0580003a9c11a	0580003a9a223
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
0580000d0d0e	0580003a9c474	0580003a9b79c
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0580000a0c257	0580003a9894e	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0580003a9c1ee		
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0580000a0c007	0580003a9e0f0	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0580000a0c3e0	0580003a9e432	

Palette non complète

- The operator pulls the pallet
- The application displays boxes identified





Pallet Control Application (3)

Réception / Expédition V200

Pôle traçabilité

Ilot Réception / Expédition

Planche de destination

RAZ
Validation matériel
Connexion Handheld
Finir

Étiquettes affichées

Identifiant Palette : 058000044e13

0580003a9f33	0580003a9f16	0580003a9f39
0580003a9f17	0580003a9f0e	0580003a9f36
0580003a9f33	0580003a9f37	0580003a9f18
0580003a9f30	0580003a9f41	0580003a9f35
0580003a9f11	0580003a9f1a	0580003a9f22
0580003a9f48	0580003a9f74	0580003a9f9c
0580003a9f27	0580003a9f4e	
0580003a9f37	0580003a9f49	
0580003a9f3e	0580003a9f42	

0580003a9f33	20/04/2009 09:22:25	Quai n°1
0580003a9f16	20/04/2009 09:22:54	Quai n°1
0580003a9f39	20/04/2009 09:22:56	Quai n°1
0580003a9f17	20/04/2009 09:22:57	Quai n°1
0580003a9f0e	20/04/2009 09:22:57	Quai n°1
0580003a9f36	20/04/2009 09:22:57	Quai n°1
0580003a9f33	20/04/2009 09:22:57	Quai n°1
0580003a9f37	20/04/2009 09:22:58	Quai n°1
0580003a9f18	20/04/2009 09:22:58	Quai n°1
0580003a9f35	20/04/2009 09:22:58	Quai n°1
0580003a9f30	20/04/2009 09:22:58	Quai n°1
0580003a9f41	20/04/2009 09:22:58	Quai n°1
0580003a9f35	20/04/2009 09:22:58	Quai n°1
0580003a9f11	20/04/2009 09:22:58	Quai n°1
0580003a9f1a	20/04/2009 09:22:58	Quai n°1
0580003a9f22	20/04/2009 09:22:58	Quai n°1
0580003a9f48	20/04/2009 09:22:58	Quai n°1

Nombre de cartons détectés : 24

Palette conforme

- All boxes are identified
- The application displays that the pallet is as it should



Pallet Control Application (4)

Ilot Réception / Expédition

Pôle traçabilité

Plaque de destination: RAZ, Validation matériel, Connexion Handheld, Fermer

Identifiant Palette : 058000044e13

Nombre de cartons détectés : 25

Palette non conforme

Identifiant	Date	Heure	Statut
0580003a9f33	20/04/2009	09:22:25	Quasi n°1
0580003a9f16	20/04/2009	09:22:54	Quasi n°1
0580003a9f35	20/04/2009	09:22:56	Quasi n°1
0580003a9f17	20/04/2009	09:22:56	Quasi n°1
0580003a9f0e	20/04/2009	09:22:57	Quasi n°1
0580003a9f33	20/04/2009	09:22:57	Quasi n°1
0580003a9f30	20/04/2009	09:22:57	Quasi n°1
0580003a9f41	20/04/2009	09:22:58	Quasi n°1
0580003a9f44	20/04/2009	09:22:58	Quasi n°1
0580003a9f11	20/04/2009	09:22:58	Quasi n°1
0580003a9f1a	20/04/2009	09:22:58	Quasi n°1
0580003a9f22	20/04/2009	09:22:58	Quasi n°1
0580003a9f2a	20/04/2009	09:22:58	Quasi n°1
0580003a9f17	20/04/2009	09:23:37	Quasi n°1

- One box should not be on the pallet
- The application displays that the pallet is not as it should



Trial description

- Four demonstrations
 - Pallet detection
 - Item detection
 - Pick & Pack
 - Retail Store





Item Detection (1)



- Reception check on a box with a tunnel reader



Item Detection (2)

Contrôle Réception / Expédition V301

Pôle traçabilité

Ilot Contrôle Réception / Expédition

Portique de détection

RAZ
Etiquette
Fermer



Nombre d'items détectés:
0

The screenshot shows a software interface for item detection. It features a 3D rendering of an open cardboard box in the center. To the left of the box are three buttons labeled "RAZ", "Etiquette", and "Fermer". Below the box, there is a light-colored rectangular area and a label that reads "Nombre d'items détectés:" followed by the number "0". The interface is titled "Contrôle Réception / Expédition V301" and "Ilot Contrôle Réception / Expédition". The logo "Pôle traçabilité" is visible in the top left corner of the interface.

- Initially, the application displays the box as empty

Item Detection (3)

Contrôle Réception / Expédition V301

Pôle traçabilité

Ilot Contrôle Réception / Expédition

Portique de détection

RAZ
Etiquette
Fermer

Nombre d'items détectés: 8

E01690013A04C066	20/04/2009 09:27:14	Ctrl Receipt n°1
E01690013A04C051	20/04/2009 09:27:14	Ctrl Receipt n°1
E01690013A048AA9	20/04/2009 09:27:14	Ctrl Receipt n°1
E01690013A04C92C	20/04/2009 09:27:14	Ctrl Receipt n°1
E01690013A04870F	20/04/2009 09:27:16	Ctrl Receipt n°1
E01690013A04C64F	20/04/2009 09:27:17	Ctrl Receipt n°1
E01690013A04B53B	20/04/2009 09:27:17	Ctrl Receipt n°1
E01690013A04B542	20/04/2009 09:27:17	Ctrl Receipt n°1

Contrôle Réception / Expédition V301

Pôle traçabilité

Ilot Contrôle Réception / Expédition

Portique de détection

RAZ
Etiquette
Fermer

Nombre d'items détectés: 20

E01690013A04C64F	20/04/2009 09:26:07	Ctrl Receipt n°1
E01690013A04B542	20/04/2009 09:26:07	Ctrl Receipt n°1
E01690013A048AA7	20/04/2009 09:26:07	Ctrl Receipt n°1
E01690013A04C571	20/04/2009 09:26:07	Ctrl Receipt n°1
E01690013A04C091	20/04/2009 09:26:07	Ctrl Receipt n°1
E01690013A04C673	20/04/2009 09:26:08	Ctrl Receipt n°1
E01690013A04B086	20/04/2009 09:26:08	Ctrl Receipt n°1
E01690013A04BDA8	20/04/2009 09:26:08	Ctrl Receipt n°1
E01690013A048AC9	20/04/2009 09:26:08	Ctrl Receipt n°1
E01690013A04B7F1	20/04/2009 09:26:08	Ctrl Receipt n°1

- The application displays read items



Trial description

- Four demonstrations
 - Pallet detection
 - Item detection
 - Pick & Pack
 - Retail Store



Pick & Pack Process (1)



- Picking process of an order



Pick & Pack Process (2)

Gestion des Stocks

Pôle traçabilité

Gestion des Stocks

RAZ
Ferrer

Traitement Commande | Lecture USF | Gestion Stock

Stock

Commande à traiter :

Reference	Destinataire	Date
10523265	Pole Tracabilite	30/06/2007
10523344	IMAJE	18/06/2007
10568798	Destinataire3	06/06/2007

Détails Commande

Référence Commande : 10523265

Destinataire : Pôle Tracabilite

Adresse :
24 Rue Barthelomy de Laffemas -26000 Valence

Contenu de la commande :

Pot # crayons marron QUANTITE : 1
Pot # crayons jaune QUANTITE : 1

Commande en cours

Produits manquants :

Libellé	Quantité
Pot # crayons jaune	1
Pot # crayons marron	1

Actes

En Attente ...

- The operator chooses an order



Pick & Pack Process (3)

Gestion des Stocks

Pôle traçabilité

Gestion des Stocks

RAZ
Faire

Traitement Commande | Lecture UHF | Gestion Stock

Stock

Commande à traiter :

Reference	Destinataire	Date
10523265	Pole Tracabilite	30/06/2007
10523344	IMAJE	18/06/2007
10568798	Destinataire3	06/06/2007

Détails Commande

Référence Commande : 10523265

Destinataire : Pole Tracabilite

Adresse :
26 Rue Barthélemy de Laffemas - 26000 Valence
Contenu de la commande:
Pot # crayons maron QUANTITE : 1
Pot # crayons jaune QUANTITE : 1

Commande en cours

Produits manquants :

Libellé	Quantité
Pot # crayons maron	1

Action

Détection

Tag n° E01690013A0489D3

Date : 20/04/2009 09:35:14

Action : Sortie stock

- The application removes read items from the list of items



Pick & Pack Process (4)

Gestion des Stocks

Pôle traçabilité

Gestion des Stocks

RAZ
Fermer

Traitement Commande | Lecture UHF | Gestion Stock

Stock

Commande a traiter :

Reference	Destinataire	Date
10523265	Pole Tracabilite	30/06/2007
10523344	IMAJE	18/06/2007
10568798	Destinataire3	06/06/2007

Adresse Commande : 10523265
Destinataire : Pole Tracabilite
Adresse : 25, Rue Parthénon de l'Attique - 11500 Athènes

Erreur : Produit n'appartenant pas à la commande

Commande en cours

Produits manquants :

Libellé	Quantité
Pot 8 crayons marron	1

Action :

Détection
Tag n° E01690010807F200
Date : 20/04/2009 09:36:34
Action : Sortie stock

- The application produces warnings if items not in the list are picked



Pick & Pack Process (5)

Gestion des Stocks

Pôle traçabilité

Traitem. Commande | Liste des URF | Gestion Stock

Stock

Commande à traiter :

Reference	Destinataire	Date
10523344	IMAJE	18/06/2007
10568798	Destinataire3	06/06/2007

Détails Commande :

Reference Commande : 10523755
 Destinataire : Pôle Tracabilité
 Adresse : 24 Rue Barthélemy de Laffemas - 26000 Valence

Contenu de la commande :

Pat Magazine marron - QUANTITE : 1
 Pat Magazine jaune - QUANTITE : 1

Commande complete, Impression en cours...

Commande en cours

Produits manquants :

Libellé	Quantité
Bouteille Vittel	5
Tee-Shirt	5

Action

Détection

Tag n° E01690013A04A858
 Date : 20/04/2009 09:37:26
 Action : Sortie stock

- The application
 - Informs when all products on the list are picked
 - Prints the RFID label



Trial description

- Four demonstrations
 - Pallet detection
 - Item detection
 - Pick & Pack
 - Retail Store



The Retail Store (1)





The Retail Store (2)

W E
A R **VIRTUAL WEAR®**
Prêt à porter Masculin - Féminin

UID	Modèle	Taille	Fournisseur	Coût
▶ 161420280640540	Sweat beige	XL	Strauss	70
161420280640540	Sweat noir	XL	Strauss	65
161472518480875	Bouteille	50 Cl	Vittel	2
* Coût total (€ TTC)				137

Annuler
Valider

- Products are put on the sale point
- The application displays the amount due by the client



The Retail Store (3)






W E
A R **VIRTUAL WEAR®**
Prêt à porter Masculin - Féminin

STOCKS

Bouteille (50 Cl)	Lot 3 Pots (Grand Format)	Pot Blanc (Grand Format)	Pot Jaune (Grand Format)	Pot Marron (Grand Format)	Sweat Beige (L)	Sweat beige (XL)	Sweat Noir (L)
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MASQUIN

Bouteille (50 Cl)	Lot 3 Pots (Grand Format)	Pot Blanc (Grand Format)	Pot Jaune (Grand Format)	Pot Marron (Grand Format)	Sweat Beige (L)	Sweat beige (XL)	Sweat Noir (L)
-------------------	---------------------------	--------------------------	--------------------------	---------------------------	-----------------	------------------	----------------

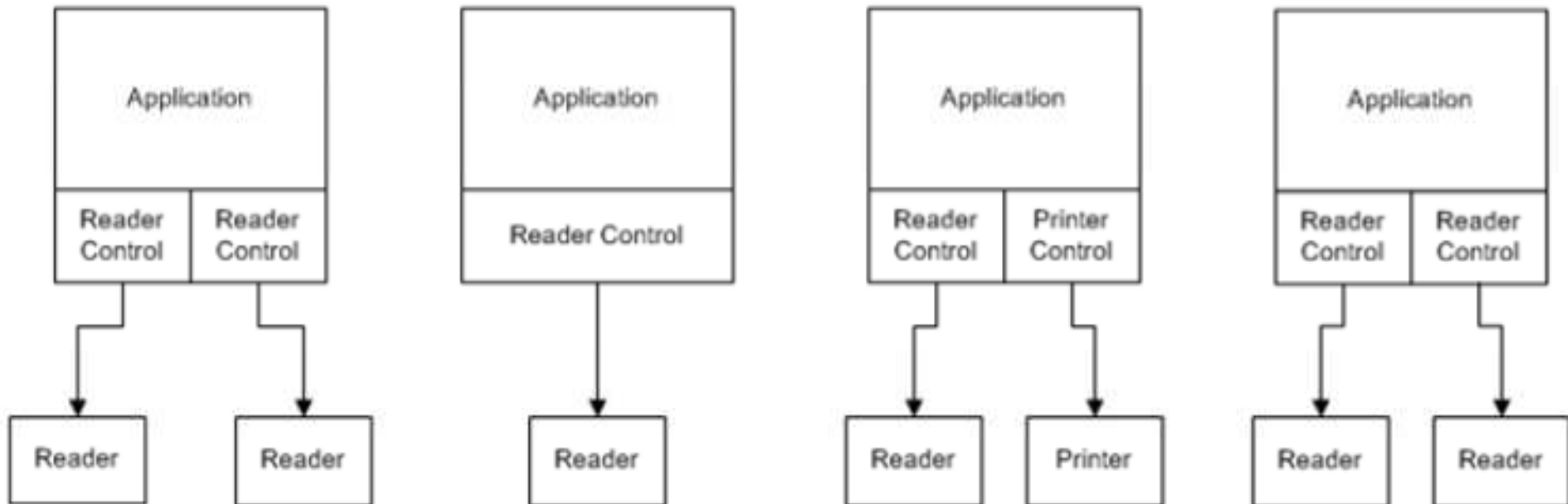
Réinitialiser
Fermer

STOCKS BAS

- Operator brings products from the back office
- Application updates real-time stock

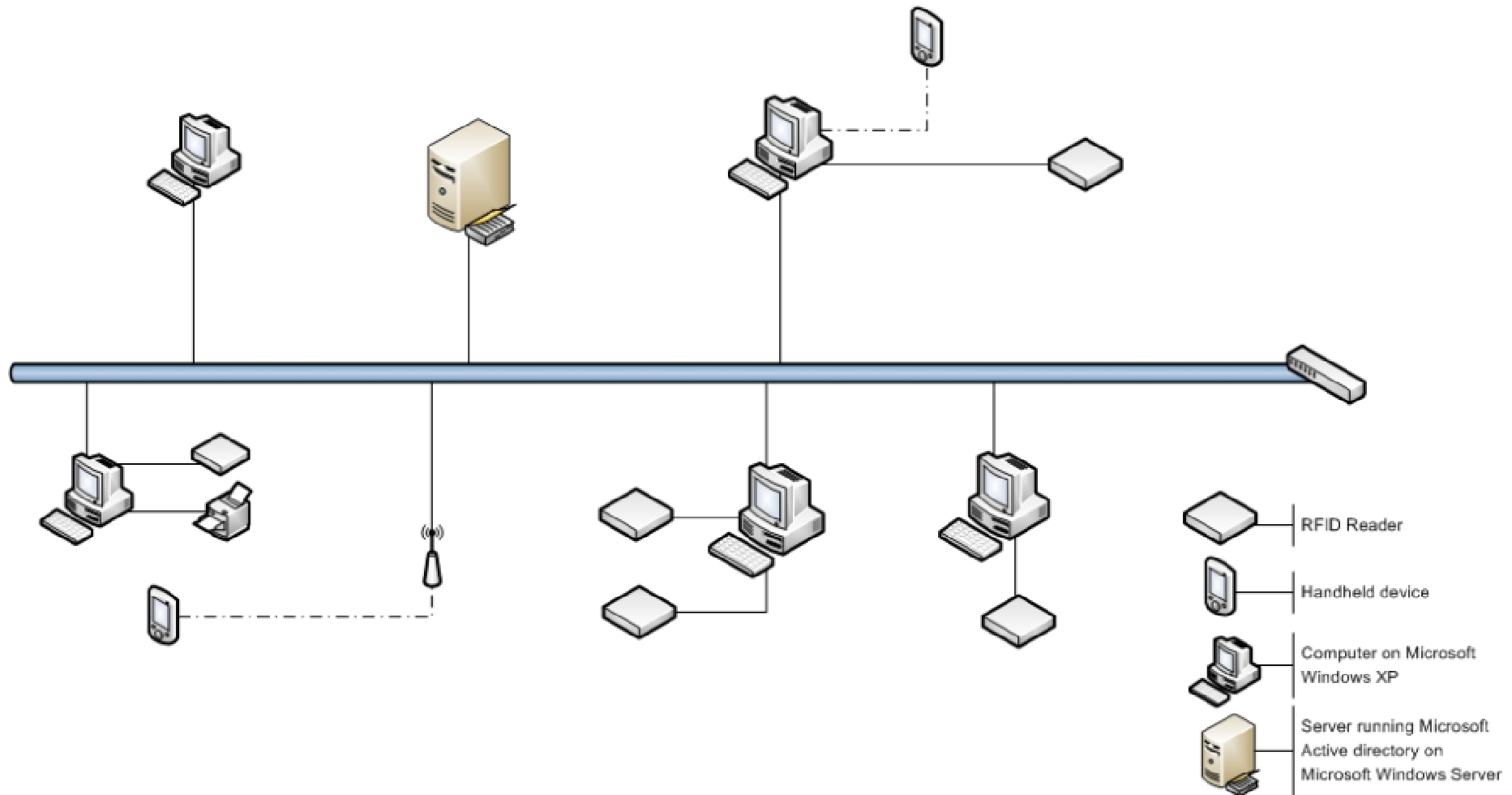


Existing IT Infrastructure (1)



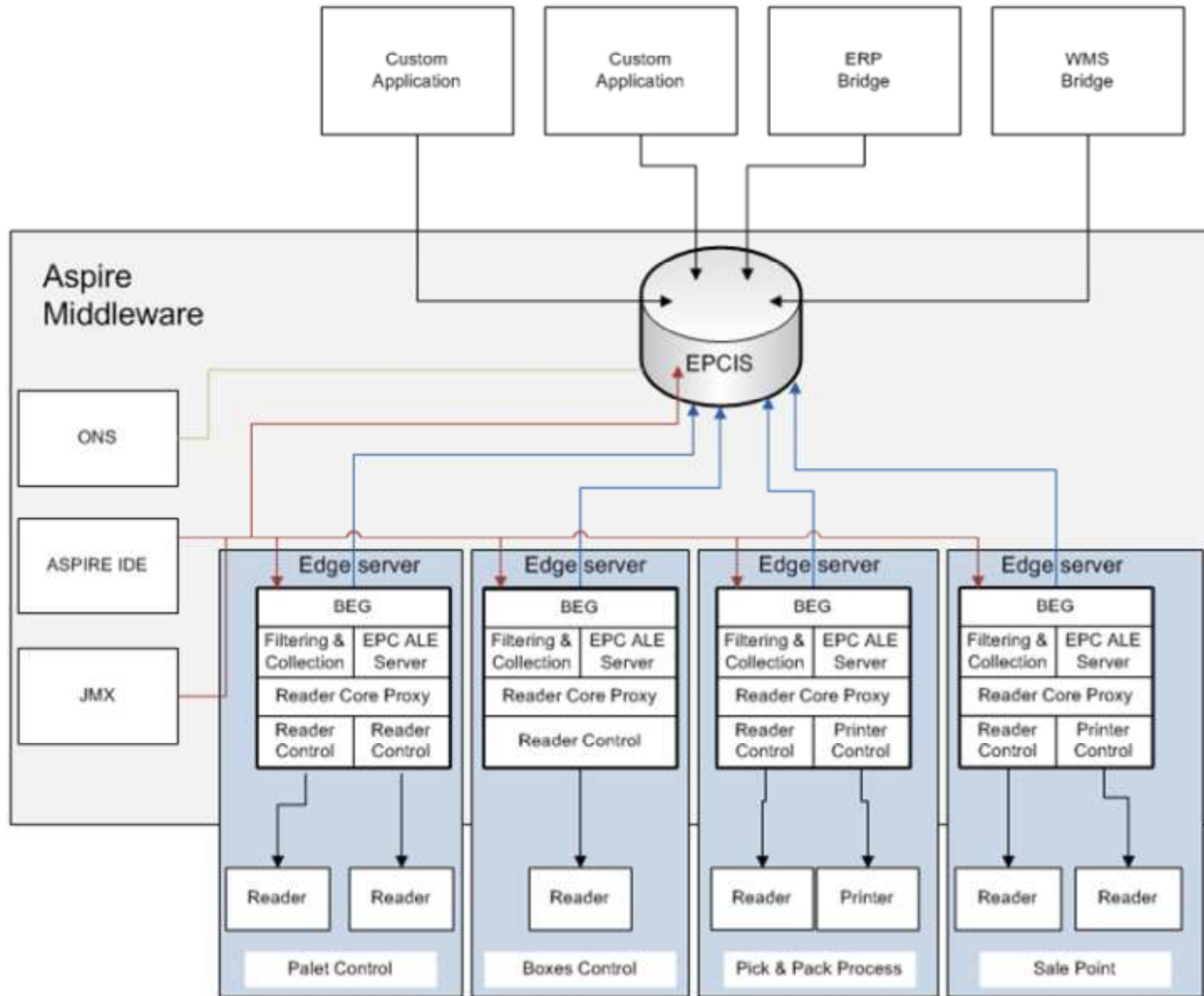


Existing IT Infrastructure (2)



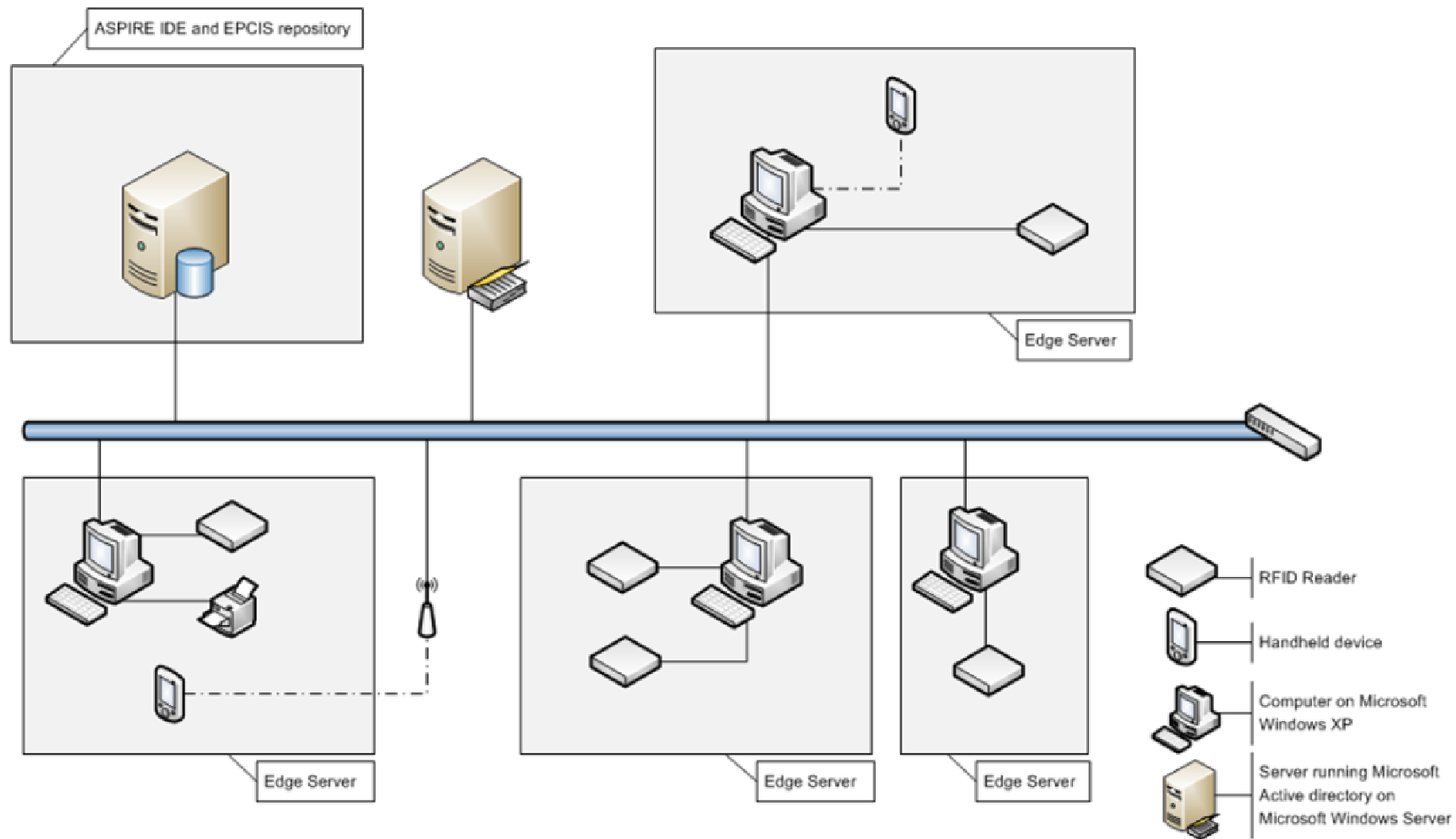


ASPIRE-Based IT Infrastructure (1)



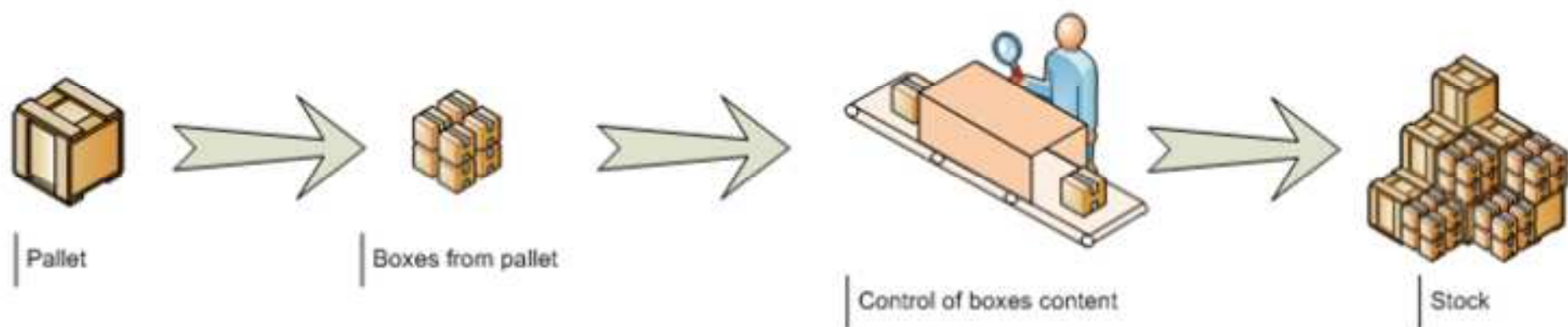


ASPIRE-Based IT Infrastructure (2)



ASPIRE-Based Business Processes (1)

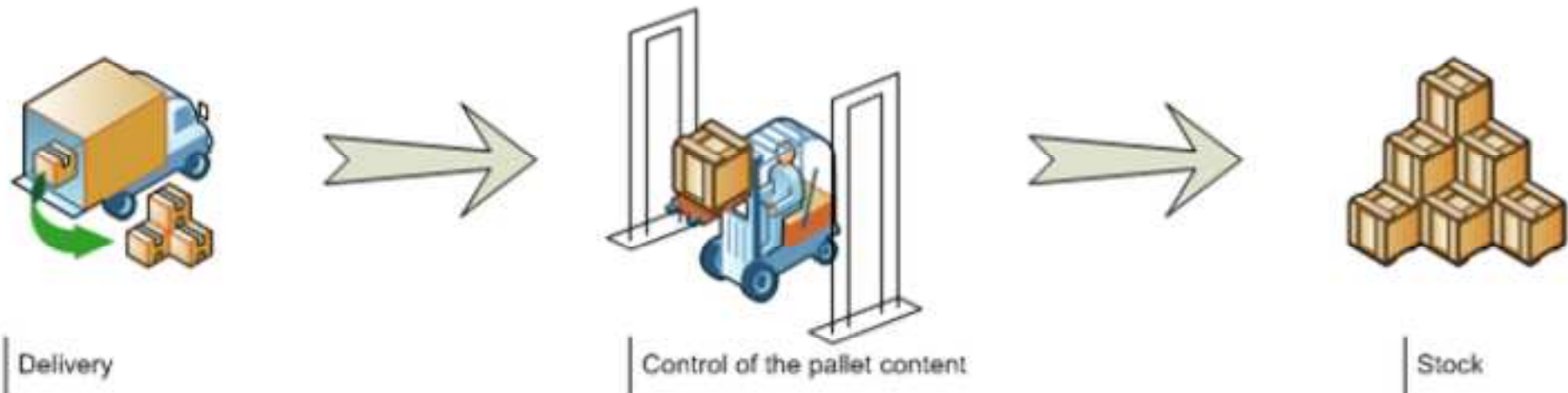
- Reception check on boxes with a tunnel reader





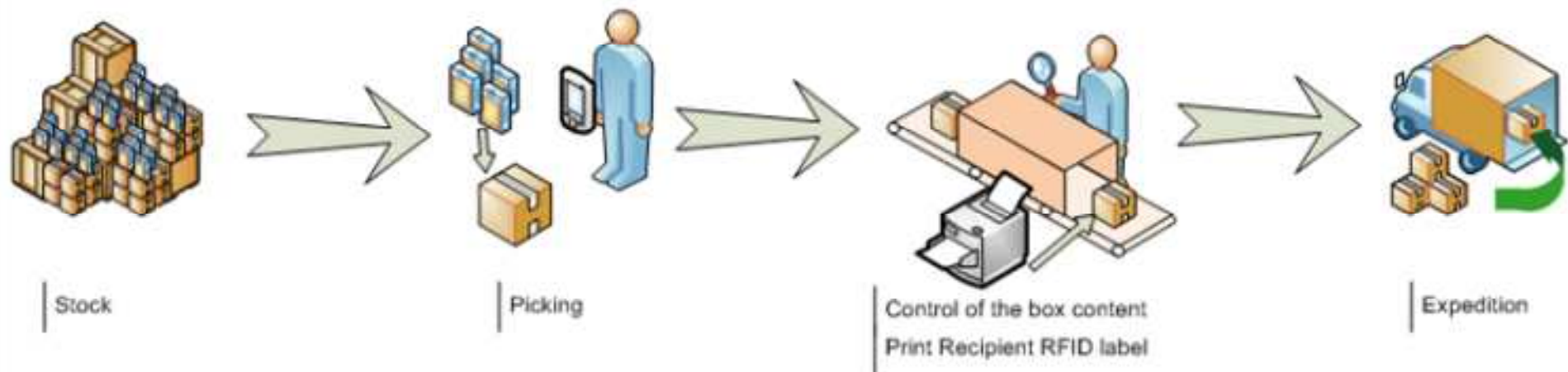
ASPIRE-Based Business Processes (2)

- Reception check on a pallet with a portal reader



ASPIRE-Based Business Processes (3)

- Pick & pack according to an order





Summary

Company Name	SENSAP S.A.	STAFF Jeans&Co	Pôle Traçabilité Lab
Country	Greece	Greece	France
Sector	Packaging	Apparrel	Demo
Focus	Logistics/Supply Chain	Logistics/Supply Chain and Retail	Intra Enterprise Logistics Process Management Demonstration
Level of Tagging	Pallet	Item	Pallet/Item (demo)
Number of Tagged Objects	Thousands	Hundreds of thousands	Hundreds
Hardware	RFID Readers	RFID Readers Touch Screens	RFID Readers
Middleware	AspireRfid Middleware	AspireRfid Middleware	AspireRfid Middleware
Integration with other software	SENSAP ERP System	Logistics Vision WMS System	AspireRfid Demo Applications
Added-Value Features	Temparature Monitoring	-	-





References – Additional Reading

- ASPIRE Public Deliverable D6.1

