



Enabling Plant-to-Enterprise Interoperability at Arla Foods with SAP and Partner Solution

Adaptive Manufacturing Summit
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THE BEST-RUN BUSINESSES RUN SAP™ 



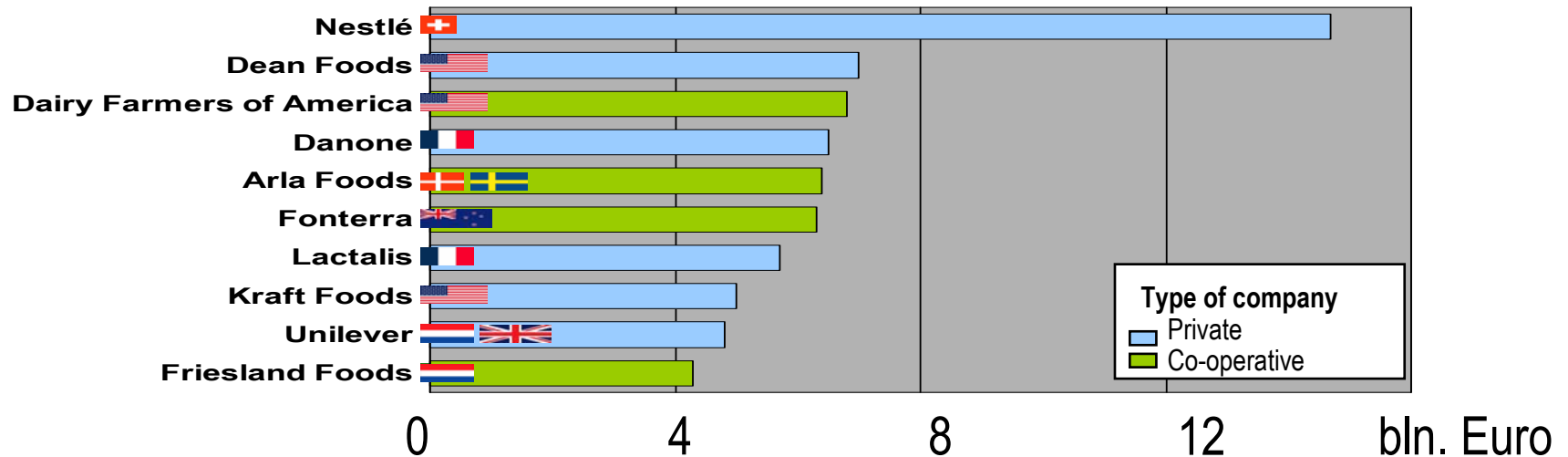
Company Background and Challenges

Arla Foods Integrated Manufacturing Strategy

Solution Implementation and Next Steps

Lessons Learned

Arla Foods, global positioning & key figures



Employees

| | |
|---------------|---------------|
| Total | 20,076 |
| Denmark | 8,186 |
| Great Britain | 6,035 |
| Sweden | 4,281 |
| Other | 1,574 |

Turnover

| | |
|---------------|--------------------|
| Total | 7 bln. Euro |
| Great Britain | 32.4% |
| Sweden | 21% |
| Denmark | 19.1% |

65 Production Sites across DK, SE, UK, ARG, US, Poland, China

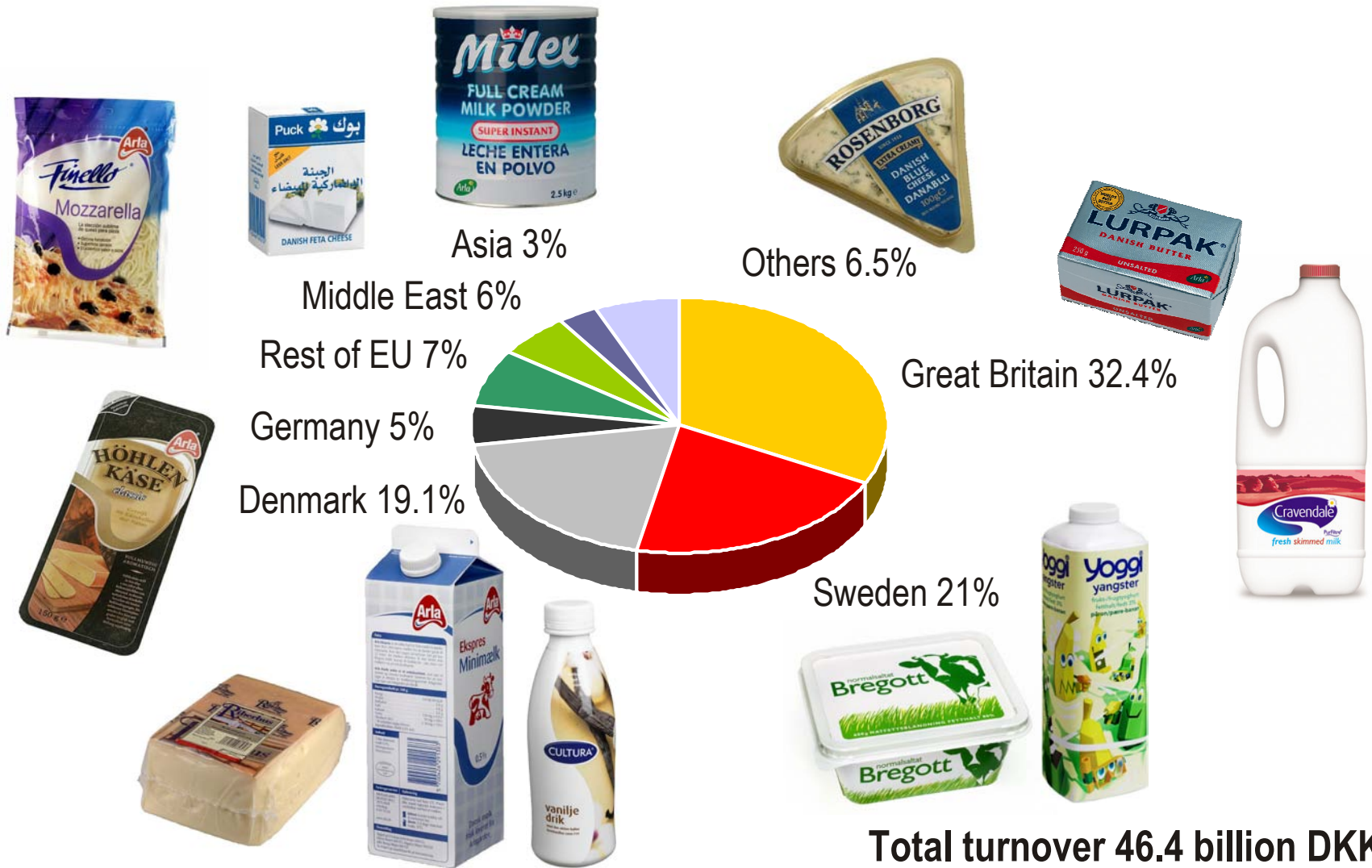
Source: Arla Foods Annual Report 2004/05

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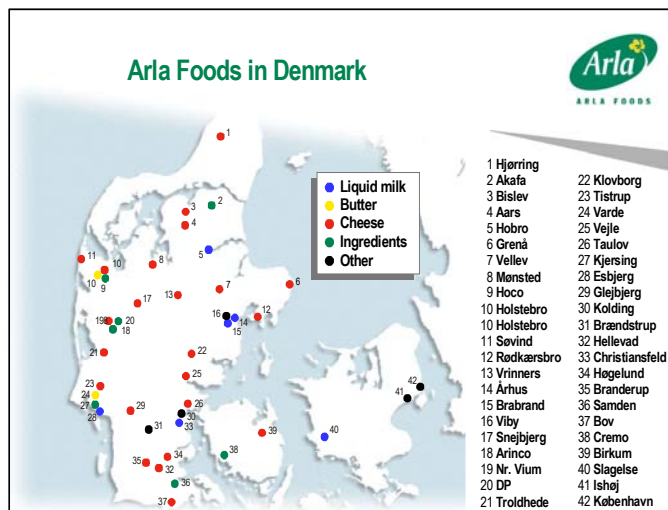
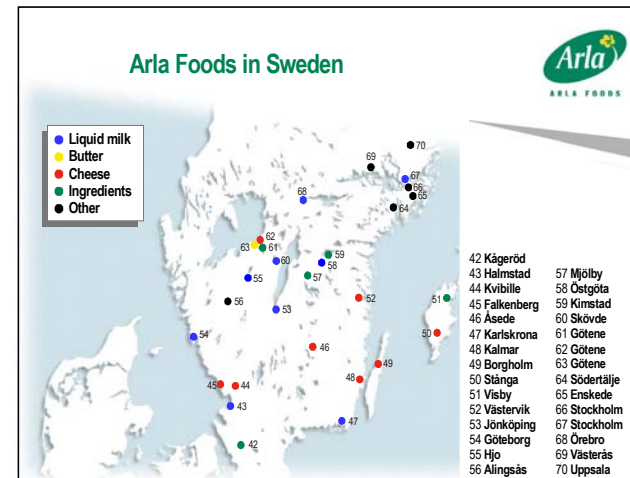
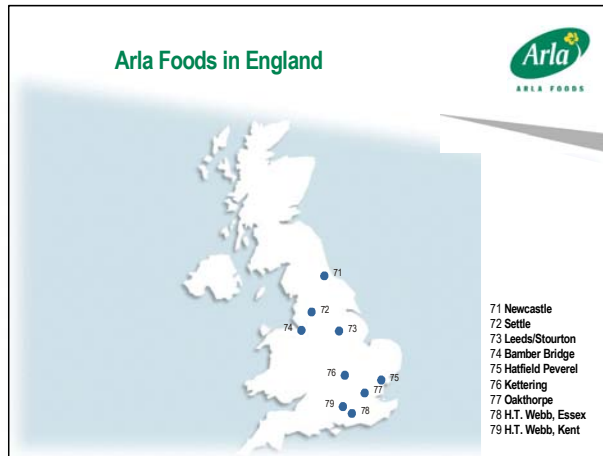


Arla Foods Products - market break-down



Source: Arla Foods Annual Report 2004/05

Arla Foods geography



Milk producing sites - ca. 25 dairies

Cheese sites - ca. 25 dairies

**Powder sites - 12 factories
(DK,SE,D,Arg)**

Larger sites

300-500 mio. USD/year

100-300 employees

Key Challenges



- Arla evolved from mergers & acquisitions and have a **heterogeneous manufacturing environment**
- The drive for **increased profitability** put pressure on **manufacturing effectiveness & cost reduction**

This creates the overall requirements of, what the Production-IT team must deliver to the business:

- Arla needs to **increase visibility (in real time) into operations** to improve planning and execution across multiple plants
- Arla requires a **generic approach for INTEGRATED MANUFACTURING** to ensure lower TCO:
 - **Implementation speed** (time to market)
 - **Utilize existing plant infrastructures** – focus on process optimization
 - **Ability to re-use across multiple plants**



Company Background and Challenges

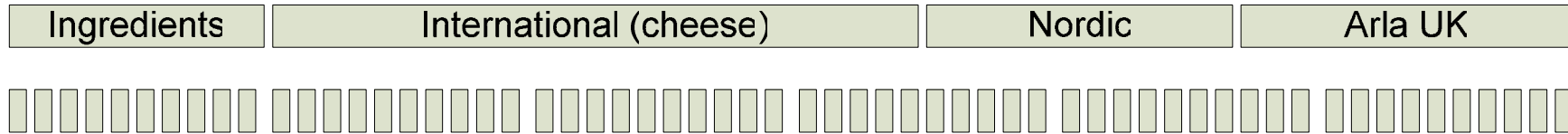
Arla Foods Integrated Manufacturing Strategy

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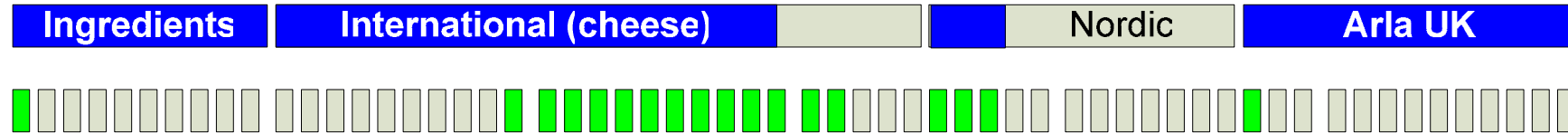
Lessons Learned

Application Strategy: From Legacy islands to Integrated Manufacturing

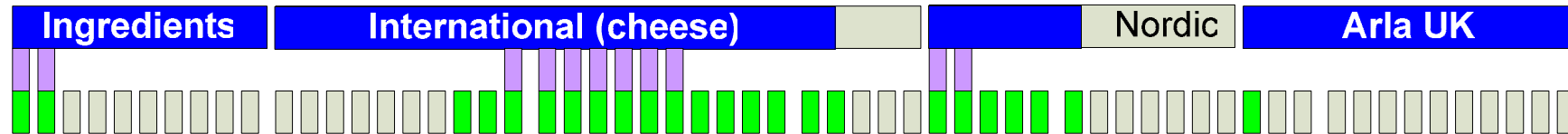
2002: All SAP R2 / Movex, no MES implemented



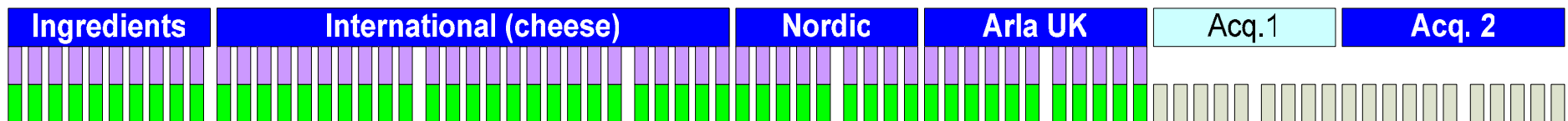
2002-2005: SAP R/3 roll-out, MES strategy + roll-out from 2004



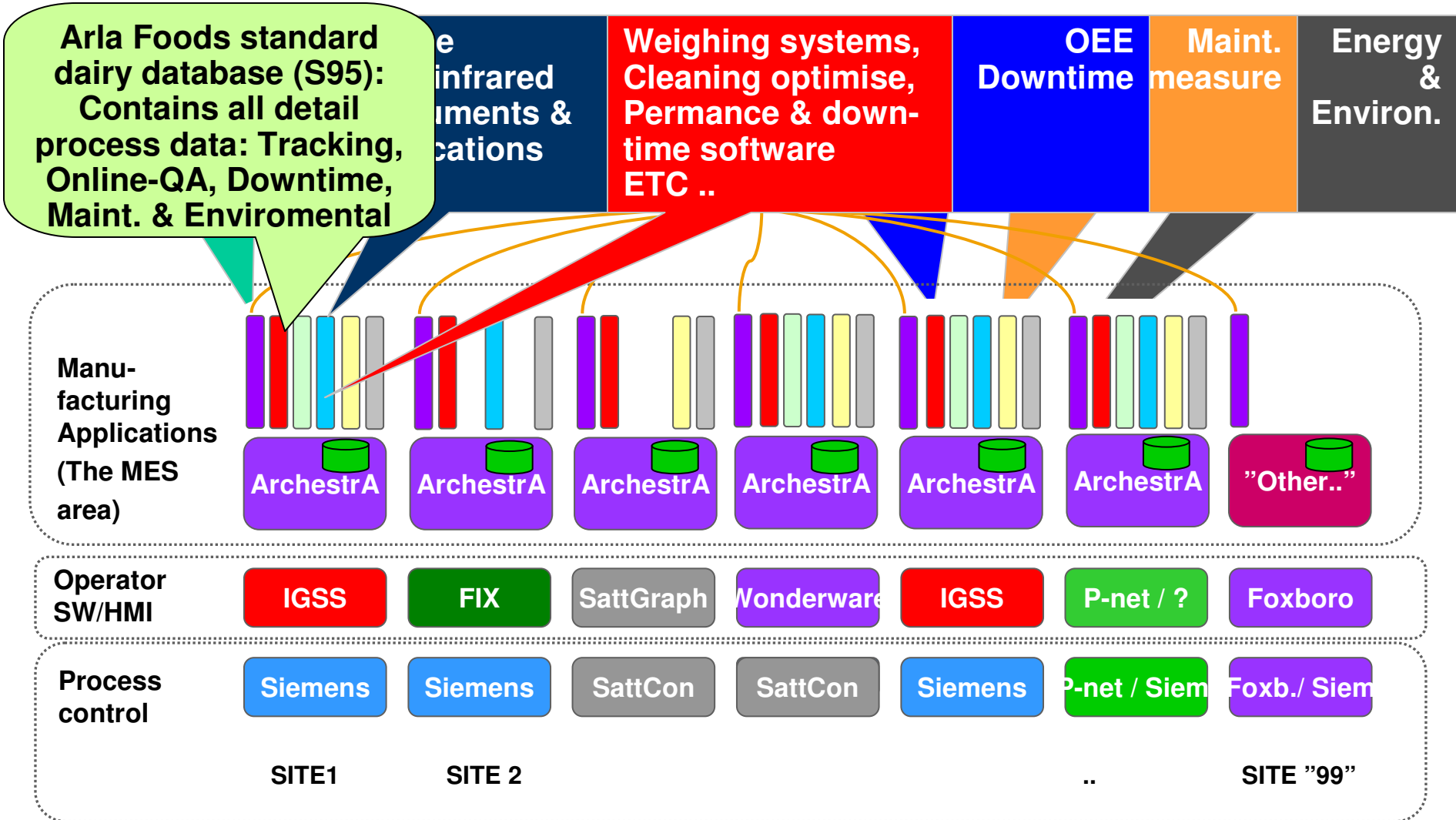
2006: Integrated Manufacturing taking off



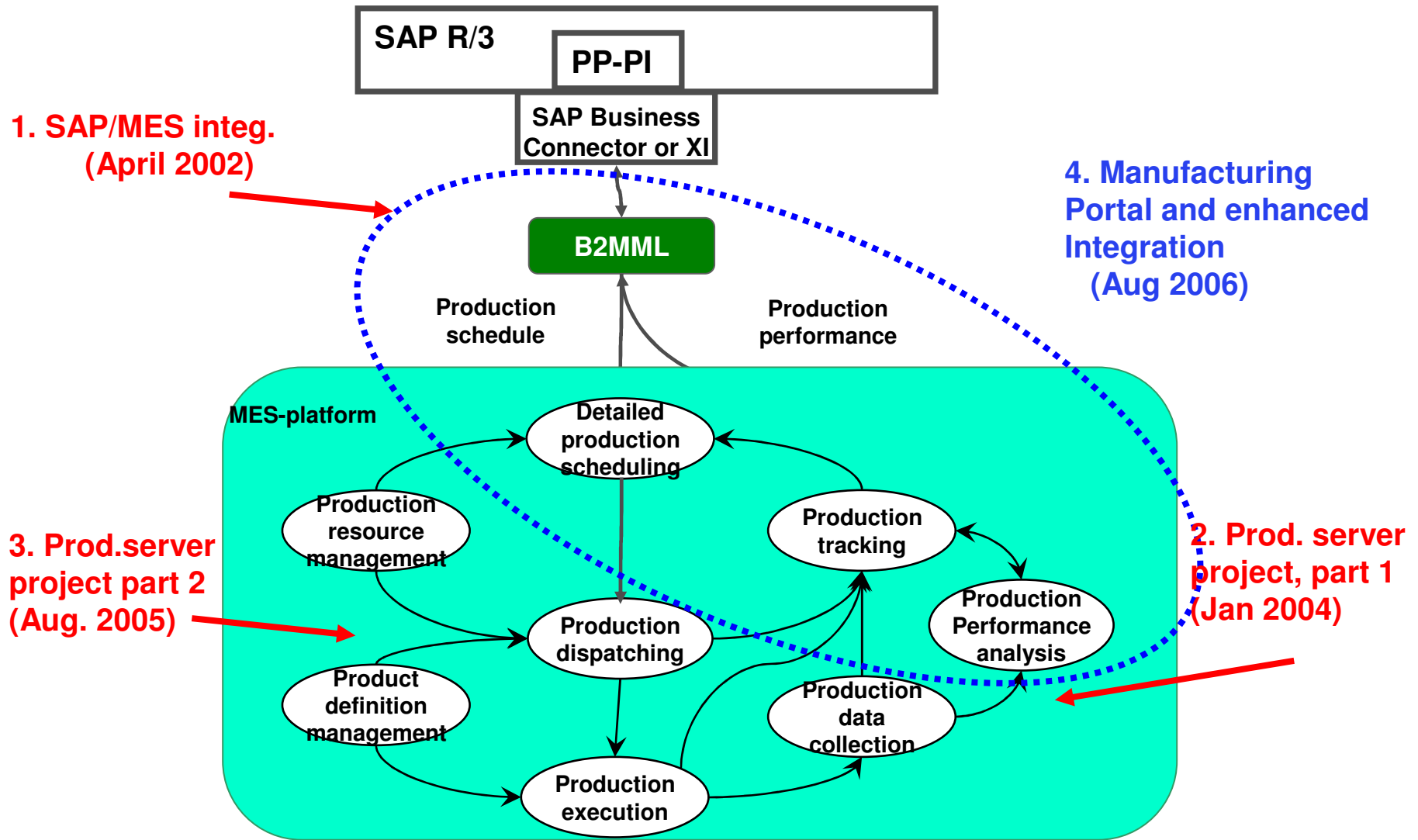
2010: Integrated Manufacturing - some sites closed down, new acquisitions



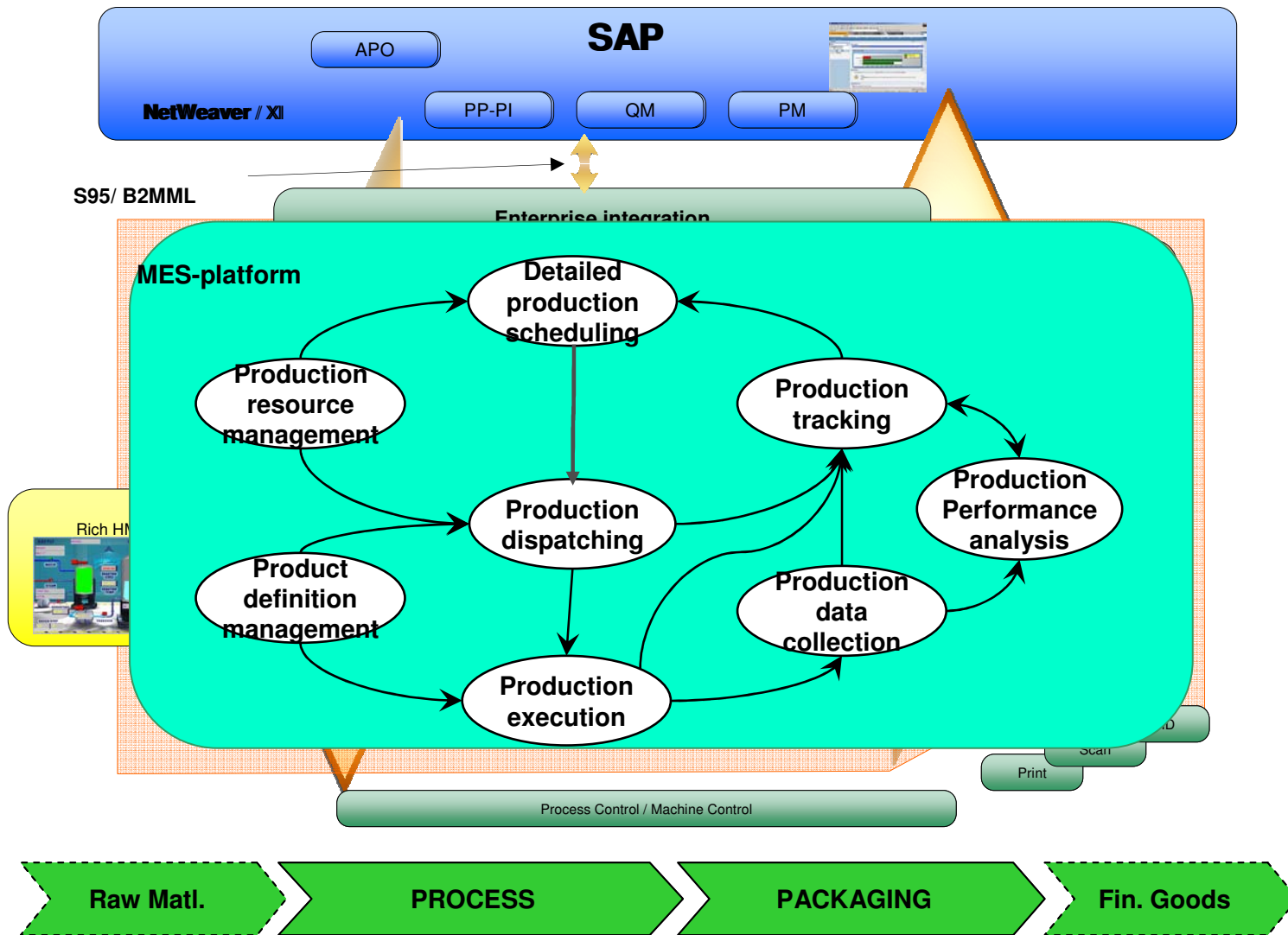
AS-IS situation on the Plant Floor: Heterogenous plant floors across 65 sites!



The S95 standards view on Manufacturing in relation to 4 steps in Arla strategy



The Integrated Manufacturing solution map..



AS-IS situation 2006

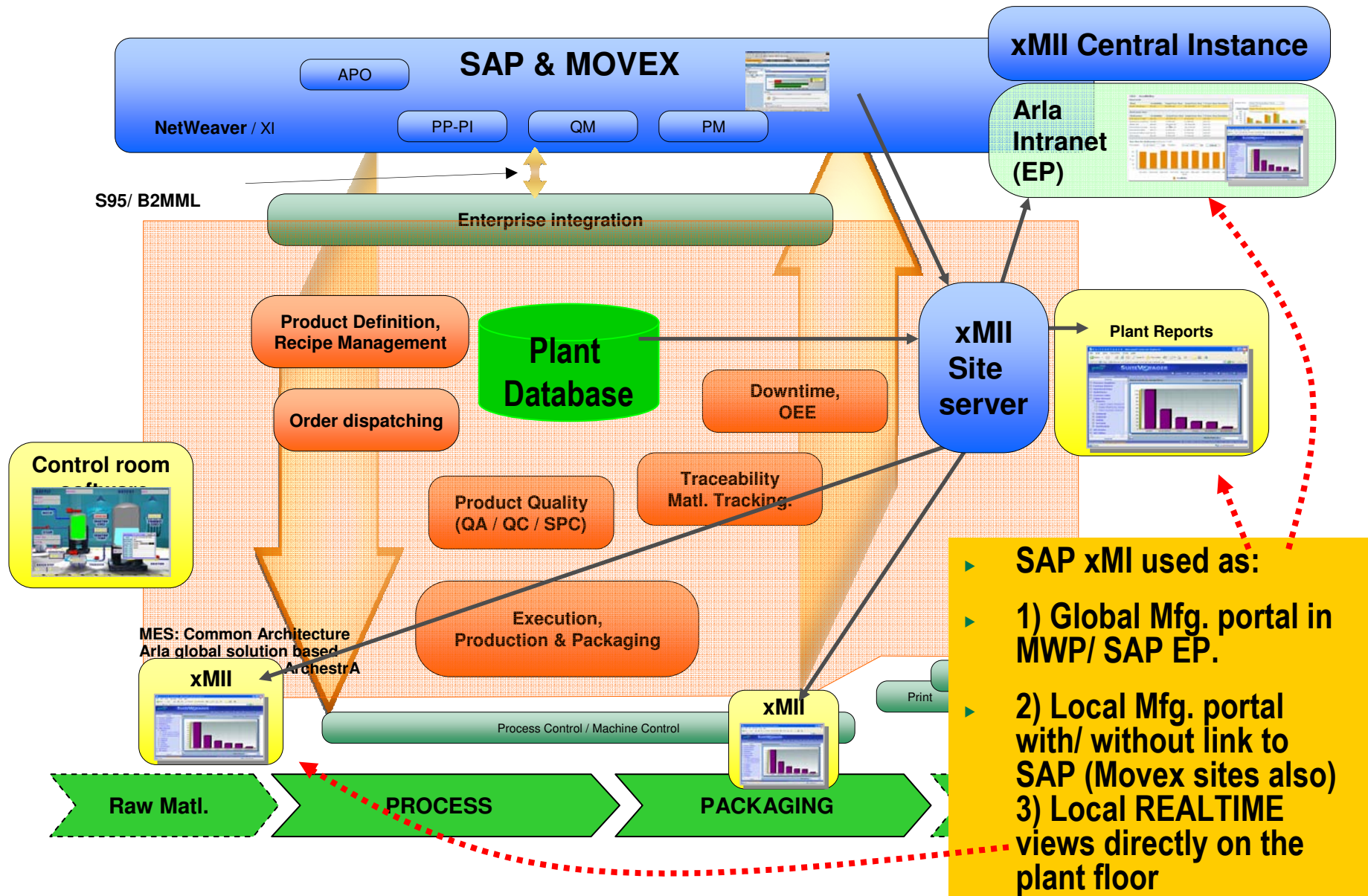


- **Heterogeneous environment of legacy apps** on the plant floor are being encapsulated by the "Arla Production Server" solution.
 - A **global MES engine & production database is rolled out** => a well defined interface upwards
- The **R/3 roll-out** of ALL business processes ongoing.
- **Enterprise Portal (Arla MyWorkPlace)** for all employees.
- The **B2M integration between ERP systems and MES** based on **XI**.
- **Business reporting tools** in place (Cognos and BW)

What is needed:

- **Manufacturing portal tools needed**
- **More agile integration to ERP needed**

The REALTIME portal - joint central and localised solution



- ▶ SAP xMI used as:
- ▶ 1) Global Mfg. portal in MWP/ SAP EP.
- ▶ 2) Local Mfg. portal with/ without link to SAP (Movex sites also)
- ▶ 3) Local REALTIME views directly on the plant floor

■ Objectives for choosing and deploying SAP xMII



- **The Business Case was based on a strategic match of the product, NOT on pay-back calculation.**
- **Completion of the Arla Solution Map by adding the Plant Visibility component:**
 - We have a strong MES engine, we (will eventually) have **data collected in the same S95-structured form** from all sites
 - We need to bring these **data in use at any level of the organization in a rapid roll-out.** (Gives value pay-back on several other IT-solutions below!)
- **We have several business reporting tools, several mfg. reporting tools. The goal is to have one portal that can:**
 - Be used in a **joint localized /central solution** on the “**standard**” **SAP sites.**
 - Be used **local on non-SAP sites**
- **Get in sync. with SAPs strategy on B2M integration. Support for S95 is now part of the SAP xMII package**
- **Use SAP xMII to make more friendly user interfaces for any role, e.g. in the Lab, on the plant floor and many others..**

EXAMPLES of Key Metrics that we will monitor with SAP xMII to drive Superior Performance at Arla Foods

Global Metrics/KPIs

- Dairy efficiency benchmarking
- Cost/Kg Semi/finished good
- Overall Planning efficiency
- Overall Clean Liquid costs
- Overall Energy Reporting

Local Plant Level Metrics

- Packaging Line Efficiency
- Consumptions per batch
- Change-over times
- Cleaning time & consumables
- Energy consumption



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Overall deployment plan for SAP xMII



Short term: 3Q2006 .. 4Q2007

- Deployment of Manufacturing Portal (local on sites)

Mid term: 2007

- Integration Mfg. Portal in the Arla MyWorkPlace portal (intranet)
- Moving B2MML integration from XI to SAP xMII platform (when SAP ready with standard support in SAP xMII)
- Upgrading ad-hoc QM integrations to standard.
- Integrating equipment usage information to SAP PM.

Long term: 2nd half 2007 and after..

- Using SAP xMII for integration in our Global Procurement template ?
- Using SAP xMII as friendly front-end for other SAP and MES modules ?

Short term deployment plan



- Training for our own team, aug-sep. '06.

- Build Arla template v.1 , sep. '06
 - Batch reports, process graphics, SPC-charts a.o.
 - Have integrators trained

- Deploy template v.1 to first 10-20 sites, sep '06 – mar '07.
 - Including improvement loops.

SAP xMII Dashboard Example screen (1)

xMII Portal - Microsoft Internet Explorer

Address: http://pitsrv-vm18/Lighthammer/Illuminator?service=Personalization

xMII Menu Samples FMM

SAP xMII Portal - Administrator Logout | Change Password | Refresh | Help Docs

Administrator
 TestArea
 BatchRapport
 Generisk Batch over
 CIP Rapport
 Esrom Linie, MB1
 My xMII
 NrVium

Generisk Batch Rapport

| ProcessSegment | SAP PO | Område | BatchID | Unit | Start | Stop | VareNr | Receipt |
|------------------|--------------|------------|---------|-------------|---------------------|---------------------|--------|------------|
| KerneFlsdeTanke | Prod.Request | Oste Tanke | 6351224 | OsteTank526 | 08/28/2006 13:21:25 | 08/28/2006 13:21:25 | 40075 | RecipeName |
| KoagelBuffer | Prod.Request | Oste Tanke | 6351223 | OsteTank524 | 08/28/2006 12:23:41 | 08/28/2006 12:23:41 | 40083 | RecipeName |
| MælkeBufferTanke | Prod.Request | OsteTanke | 6351222 | OsteTank525 | 08/28/2006 11:41:56 | 08/28/2006 14:24:11 | 40083 | RecipeName |
| MælkeTanke | Prod.Request | OsteTanke | 6351221 | OsteTank523 | 08/28/2006 11:03:48 | 08/28/2006 13:51:27 | 40083 | RecipeName |
| ModerSyreTanke | Prod.Request | OsteTanke | 6351220 | OsteTank526 | 08/28/2006 10:25:06 | 08/28/2006 12:57:23 | 40083 | RecipeName |
| Osteri | Prod.Request | OsteTanke | 6351219 | OsteTank524 | 08/28/2006 09:45:55 | 08/28/2006 11:59:40 | 40626 | RecipeName |
| Osteri2 | Prod.Request | OsteTanke | 6351218 | OsteTank525 | 08/28/2006 08:57:38 | 08/28/2006 11:12:57 | 40626 | RecipeName |
| OsteTanke | Prod.Request | Oste Tanke | 6351217 | OsteTank523 | 08/28/2006 07:18:22 | 08/28/2006 09:59:30 | 40627 | RecipeName |
| TestArea | Prod.Request | Oste Tanke | 6351216 | OsteTank526 | 08/28/2006 06:38:52 | 08/28/2006 09:23:58 | 40627 | RecipeName |
| UFMælkeTanke | Prod.Request | Oste Tanke | 6351115 | OsteTank504 | 08/28/2006 06:04:01 | 08/28/2006 08:35:08 | 20550 | RecipeName |
| Utility | Prod.Request | Oste Tanke | 6351215 | OsteTank524 | 08/28/2006 05:59:10 | 08/28/2006 08:44:16 | 40627 | RecipeName |
| ValleBufferTanke | Prod.Request | Oste Tanke | 6351114 | OsteTank505 | 08/28/2006 05:23:46 | 08/28/2006 07:59:42 | 20550 | RecipeName |
| ValleFlsdeTanke | | | | | | | | |

Hent parametre Lav rapport TestKnap

| Par.Navn | Værdi | Navn | LotID | FraUnit | Mængde | Enhed |
|---------------------------|-------|-------------|---------------------------|-------------------|----------|-------|
| HensætningsTemp_Rcp | 33 | Flsde | Batch / Lot | | 20,00 | UOM |
| HensætningsTemp_Rcp | 33 | Flsde | Batch / Lot | | 20,00 | UOM |
| Hensætningstemp_Rpt | 32 | MælkeBuffer | MælkeBuffer522_25,6351222 | MælkeBuffer522_25 | 16685,00 | UOM |
| Hensætningstemp_Rpt | 33 | MælkeBuffer | MælkeBuffer522_25,6351218 | MælkeBuffer522_25 | 16685,00 | UOM |
| Intervalskæring1_omdr_Rcp | 30 | | | | | |
| Intervalskæring1_tid_Rcp | 10 | | | | | |
| Intervalskæring2_omdr_Rcp | 40 | | | | | |
| Intervalskæring2_tid_Rcp | 20 | | | | | |
| Intervalskæring3_omdr_Rcp | 0 | | | | | |
| Intervalskæring3_tid_Rcp | 0 | | | | | |
| Intervalskæring4_omdr_Rcp | 0 | | | | | |
| Intervalskæring4_tid_Rcp | 0 | | | | | |

Mængde
 LotID
 FraUnit

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Applet BatchListView started Local intranet

SAP xMII Dashboard Example screen (2)

The screenshot displays the SAP xMII Portal interface. At the top, there is a navigation bar with 'xMII Menu', 'Samples', and 'FMM'. Below this is a sidebar menu with various categories like 'Administrator', 'TestArea', and 'NrVium'. The main content area is divided into two parts: a data table and a trend chart.

Data Table:

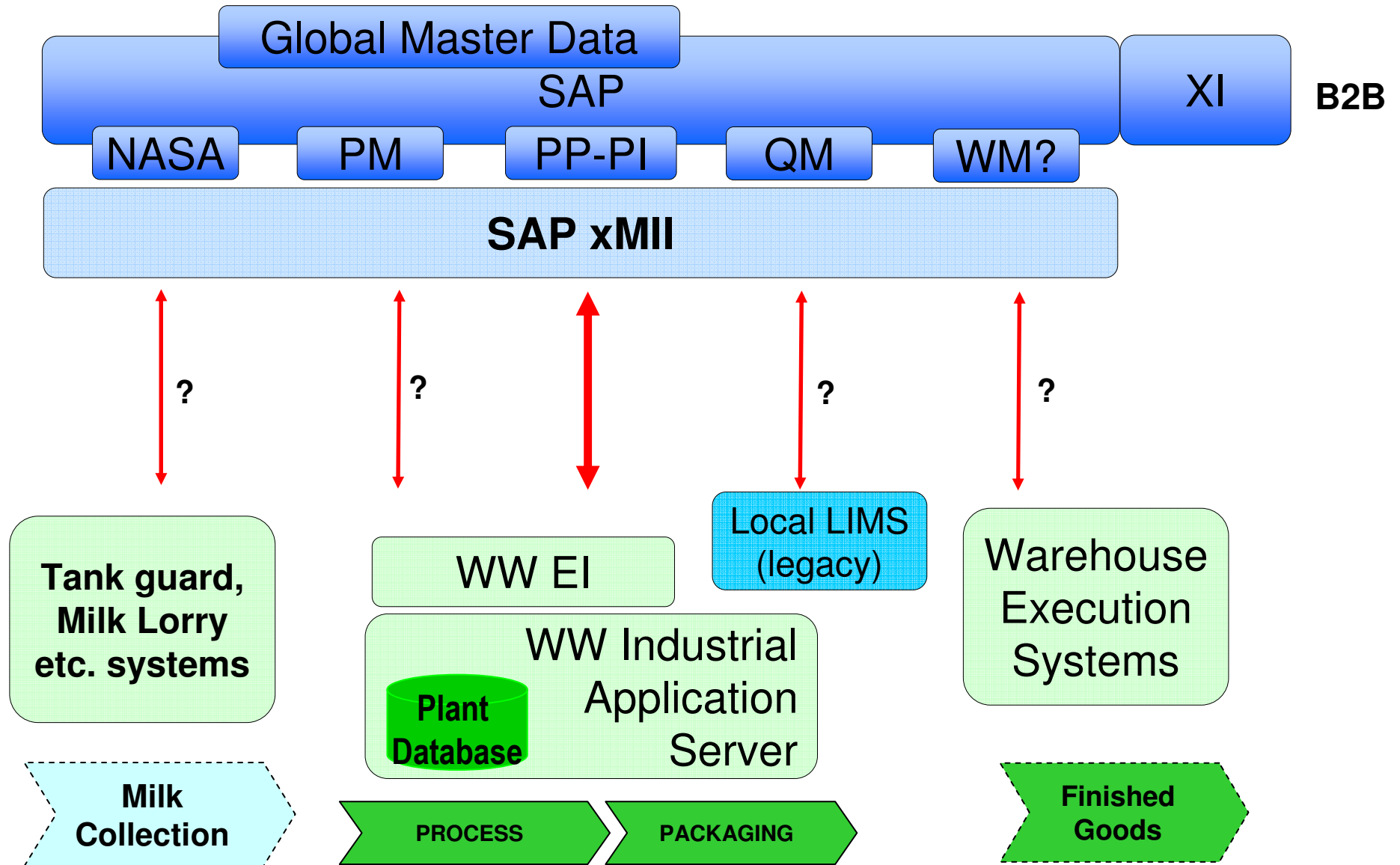
| CIP Unit | Batch | Start | Stop |
|-----------|------------------|---------------------|---------------------|
| CipLinieC | 28-08-2006 09.12 | 08/28/2006 09:12:01 | 08/28/2006 09:51:20 |
| CipLinieB | 28-08-2006 08.08 | 08/28/2006 08:08:56 | 08/28/2006 08:21:45 |
| CipLinieB | 28-08-2006 06.10 | 08/28/2006 06:10:32 | 08/28/2006 08:06:35 |
| CipLinieC | 28-08-2006 05.55 | 08/28/2006 05:55:50 | 08/28/2006 06:06:26 |
| CipLinieB | 28-08-2006 05.29 | 08/28/2006 05:29:52 | 08/28/2006 05:47:26 |
| CipLinieB | 28-08-2006 05.05 | 08/28/2006 05:05:18 | 08/28/2006 05:27:15 |
| CipLinieC | 28-08-2006 05.04 | 08/28/2006 05:04:39 | 08/28/2006 05:46:17 |
| CipLinieB | 28-08-2006 04.47 | 08/28/2006 04:47:16 | 08/28/2006 05:02:47 |
| CipLinieH | 28-08-2006 04.41 | 08/28/2006 04:41:38 | 08/28/2006 05:59:56 |
| CipLinieC | 28-08-2006 04.18 | 08/28/2006 04:18:37 | 08/28/2006 05:02:40 |
| CipLinieC | 28-08-2006 03.55 | 08/28/2006 03:55:29 | 08/28/2006 04:17:07 |
| CipLinieB | 28-08-2006 03.39 | 08/28/2006 03:39:26 | 08/28/2006 04:44:55 |
| CipLinieH | 28-08-2006 03.32 | 08/28/2006 03:32:06 | 08/28/2006 03:48:29 |

Trend Chart: The chart is titled 'Trend for batch 28-08-2006 06.10'. It shows several data series over time. The Y-axis ranges from -10,000.00 to 40,000.00. The X-axis shows dates from 08/28/06 to 08/28/06. A legend on the right identifies the series: CipLinieB.FlowFrem (blue), CipLinieB.FlowRetur (grey), CipLinieB.LedningsevneF (red), CipLinieB.pHRetur (green), CipLinieB.TrykFrem (dark red), CipLinieB.FremPumpe (purple), CipLinieB.LudFrem (magenta), and CipLinieB.RentvandFrem (yellow).

Parameter Table:

| Par.Navn | Værdi |
|-----------|-------|
| Ludtemp | 82,69 |
| ReceptNo | 3,00 |
| RuteNr | 61,00 |
| Syre Temp | 65,15 |

Next Step: A hard choice amongst opportunities





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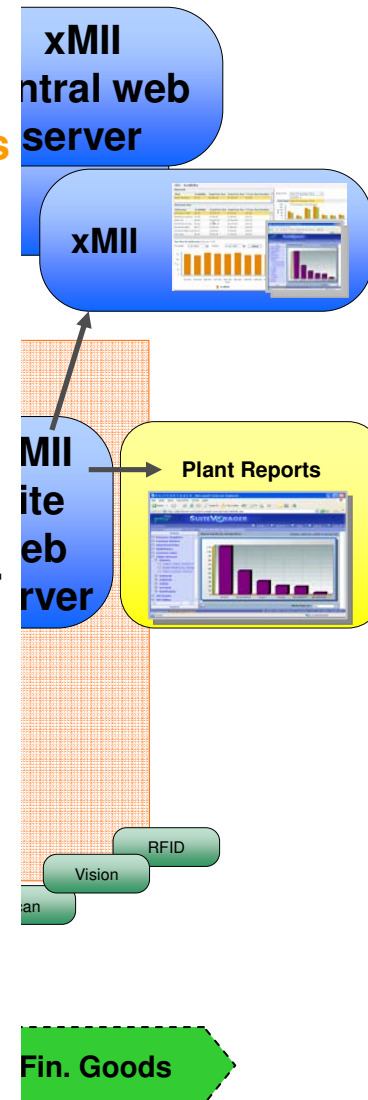
Summary

The first experiences:

- A **transparent and robust** solution
- A focused strategic cooperation between **SAP and Wonderware** – leveraging our investments in both platforms
- **Immediate buy-in** by the IT organization, because it's SAP product
- **Good support from SAP** in Exton
- Networking with other European xMII users
- There is some room for improvement 😊
 - SAP xMII lacks version control & audit trail for multi-site roll-out.

Overall conclusion

- SAP xMII will do a **good job as the Portal component** in our Mfg. Solution map.
- SAP xMII will – with the S95 support – become an **enabler for faster and more transparent B2M integrations**



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