Automation platform selection

Anders Fridh - Tetra Pak

Public
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Introduction
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Background

Started 1989 as automation engineer at SattControl in Malmö, Sweden.

Positions over the years

- Automation Engineer
- Automation Responsible
- Project manager
- Technical coordinator
- Platform owner
- Manager - Platform development

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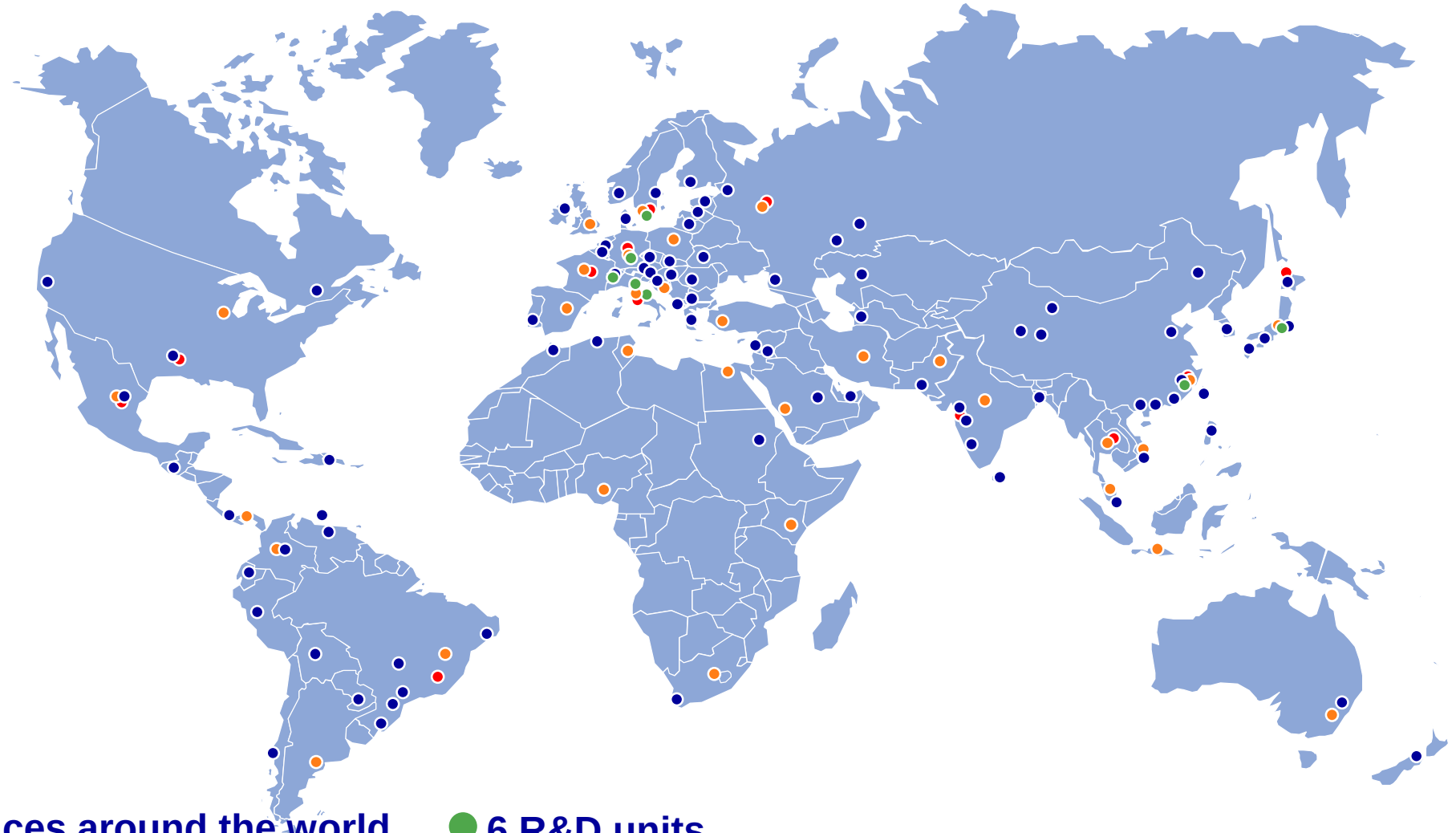
Tetra Pak introduction: Focused on our customers

We specialise in providing customers with complete solutions for the processing, packaging and distribution of food products

Present in more than 170 countries and operations in all continents



- 82 sales offices around the world
- 32 market companies
- 6 R&D units
- 13 Technical Training Centres

Total world deliveries 2014

Carton packaging material, millions of packs

179,888

Distribution machines

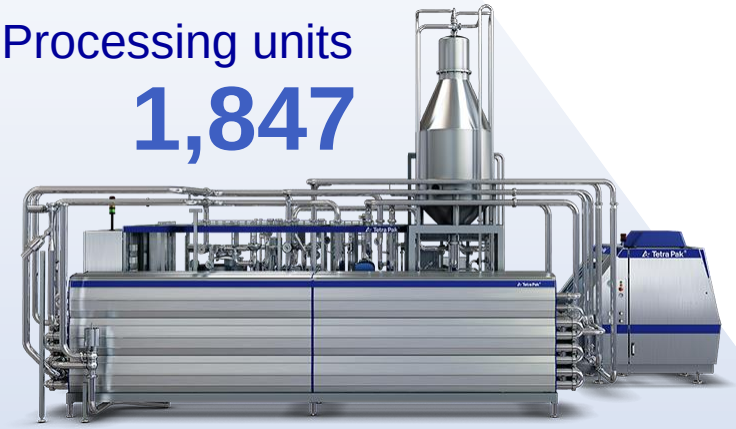
1,425

Packaging machines

484

Processing units

1,847



Tetra Pak Group, January 2015

Machines in operation

69,900
processing units

8,875
packaging machines

19,167
distribution machines

Tetra Pak in summary, January 2015

- Employees: **23,460**
- Net sales mio €: **10,900**
- Countries where Tetra Pak packages are available: **>170**
- Packaging material and closure plants: **37**
- Filling machine assembly plants: **5**
- R&D units: **6**
- Technical training centres: **13**

Automation Solutions from Tetra Pak

Automation system top priorities/drivers

Equipment Automation

- Majority of Tetra Pak equipments have automation embedded (PLC+local
- Comm look & feel between diff t types of equipment
- +3700 equipments delivered annually

Reliability & HW cost

Internal Plant Au ation

- Packagi aterial plants fully aut ed

Reliability & OT security

Plant Automation

- Plant Automation Platform delivered customized as Tetra PlantMaster™
- +600 plant sol peration
- Horizont tical integration in th PLC, User & MIS/MES with ace to ERP

Engineering efficiency & HW/ license cost

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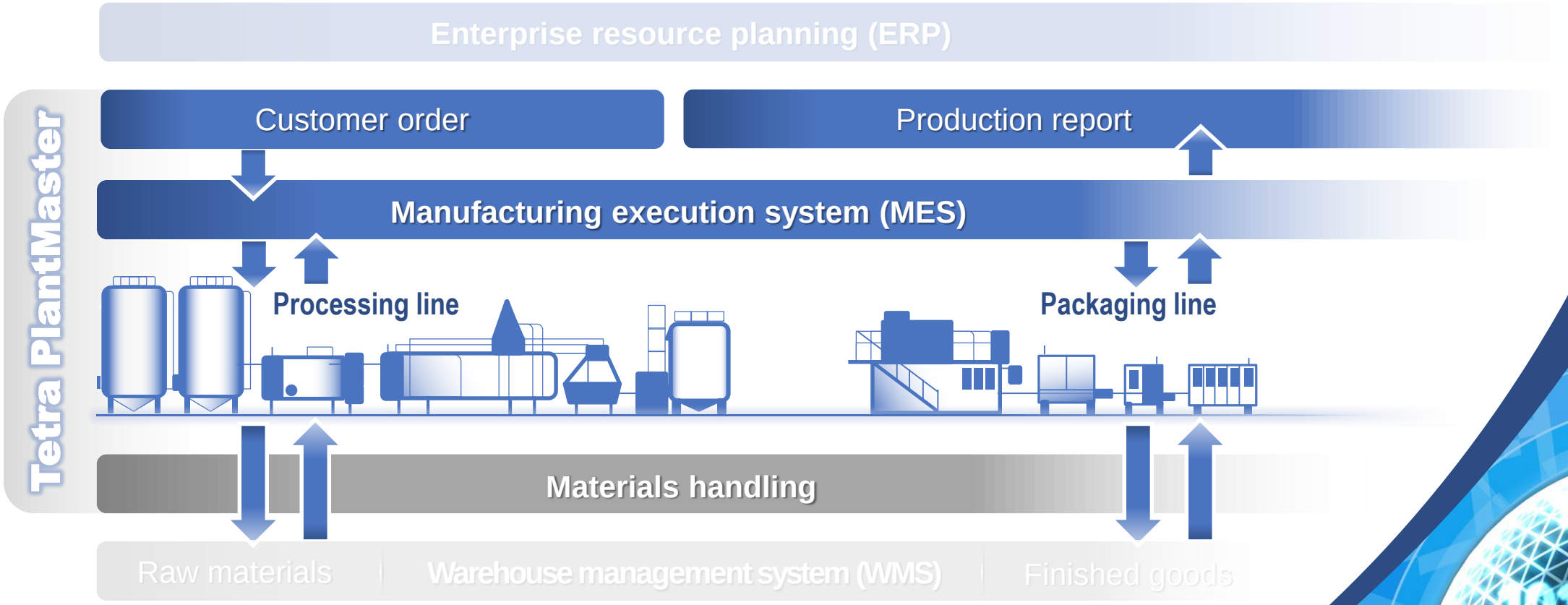
What is an automation platform for Tetra Pak?

All reusable HW & SW components needed to deliver automation solutions with high efficiency and quality in the area of PLC, SCADA/HMI and MIS/MES

The platform is a combination of **standard** components from automation suppliers and **specific** components for a certain domain.

Border lines for Tetra Pak plant automation platform



How to select/create components for an automation platform?

It is a challenging environment !

- Equipment, line, plant and enterprise levels
- PLC, SCADA/HMI, MIS/MES
- Connections towards external systems (ERP, WMS, LIMS…)
- Change/upgrade pace differs
- Industry standards with different maturity
- Brand recognition
- System integrators and end user requirements
- Capabilities
- Customer preferences

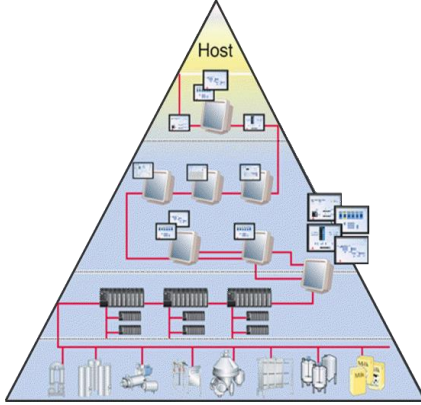
Some reflections around the challenges

Needs for the different levels: equipment, line, plant and enterprise

Level	Automation suppliers	Tetra Pak add-on
Equipment	• Low HW & SW cost • High performance • Reliability • Openness & Connectivity • Diagnostics / User friendly maintenance • IP protection	• Standardized interfaces for efficient integration - Upstream/downstream equipment - HMI - MES • Usability / Common look & feel • Built in know-how • Configuration capabilities
Line / Plant	• Low HW & SW cost • More program memory • Flexibility • Openness & Connectivity & supplier independence • Diagnostics / User friendly maintenance • Simplicity in debugging / change	• Unified system independent SW model • Usability / Common look & feel • Simplicity → Easy to change/customize • Efficient engineering
Enterprise	• Standardization • Connectivity (ERP and multi sites) • Data transfer / consolidation	• Standardization on formats (B2MML etc) • Define important multi site data • ERP←→MES connectivity (Orders, performance data…) • Translation of enterprise information to specific equipment and manage real time data/historian data

Some reflections around the challenges

PLC systems, HMI/SCADA and MIS/MES



System	High level selection criteria for Tetra Pak
PLC	• Low HW & SW cost • Engineering efficiency • Traditional and PC-based PLC systems • Global availability and support
HMI	• Low HW & SW cost • Customization possibilities on template basis • PLC independent connectivity • Configuration possibilities
SCADA	• SW license cost • Engineering efficiency • Performance (Screen update time) • Customization possibilities on template and project basis • PLC independent connectivity
MIS/MES	• Integrated system / Single point of configuration • Flexibility and customization possibilities (data exchange, reporting, dashboards…) • Engineering efficiency

Some reflections around the challenges

Change update pace differs

Our customers exchange and update the different systems with different paces!

This means different requirements on the automation platform to lower costs and risks when it happens.

- Modularity
- Flexibility
- Connectivity (Technical and functional)
- Unified system independent SW model

Some reflections around the challenges

Industry standards with different maturity

Standard helps both end users and system integrators!

… but maturity differs a lot.

Standards are

- Supplier independent (Ethernet, OPC…)
- Supplier dependent (Profibus, Devicenet…)
- Widely open for interpretations (S88, PackML…)

Manufacturing industry will benefit with more supplier independent standardization!

Some reflections around the challenges

Brand recognition

Brands are more or less dependent due to system type.

Experiences from our customers. Where is a specific brand most important:

1. PLC
2. SCADA
3. MIS/MES
4. Local HMI

Some reflections around the challenges

System integrators and end user perspective on needs

End customer / User

- Low investment / operational cost
- Reliable
- User friendly
  - Easy to operate
  - Easy to maintain / upgrade / change
  - Common look & feel
  - Act as one system
- Easy to optimize
- Flexible
  - Production changeover
  - New SKUs

System Integrator

- Engineering efficiency
  - Single point of configuration
  - Minimize number of engineering tools
- Testable / validation support
- Customization
  - Functional integration
- Diagnostic tools

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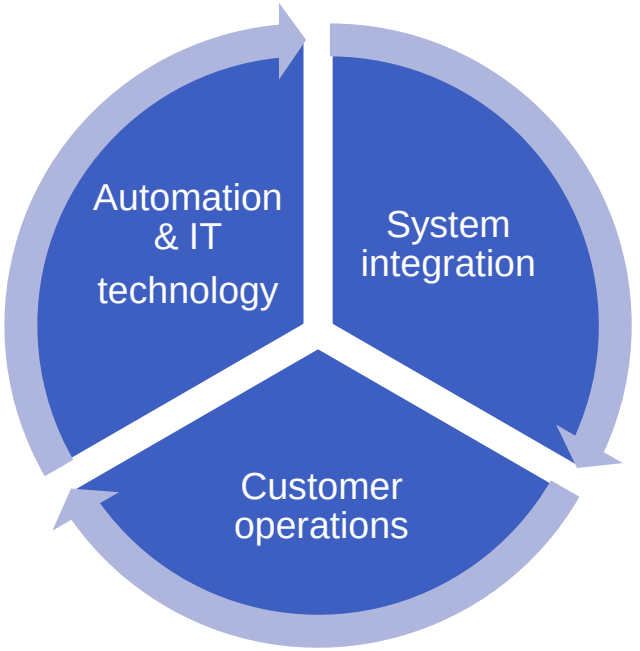
Some reflections around the challenges

Capabilities

Both end users and system integrators have limited capabilities.

We all invest in know-how for our people.

Three main areas of knowledge:



Changing the automation platform means reinvestment in people!

Some reflections around the challenges

Customer preferences

What ever you have selected as automation platform, the customer or supplier has their own preferences of what is important. ☺

Corporate standardization on all levels:

- HW / SW / Networks…
- Brands
- International standards
- Maintenance and support ambitions
- Domain functionality
- …

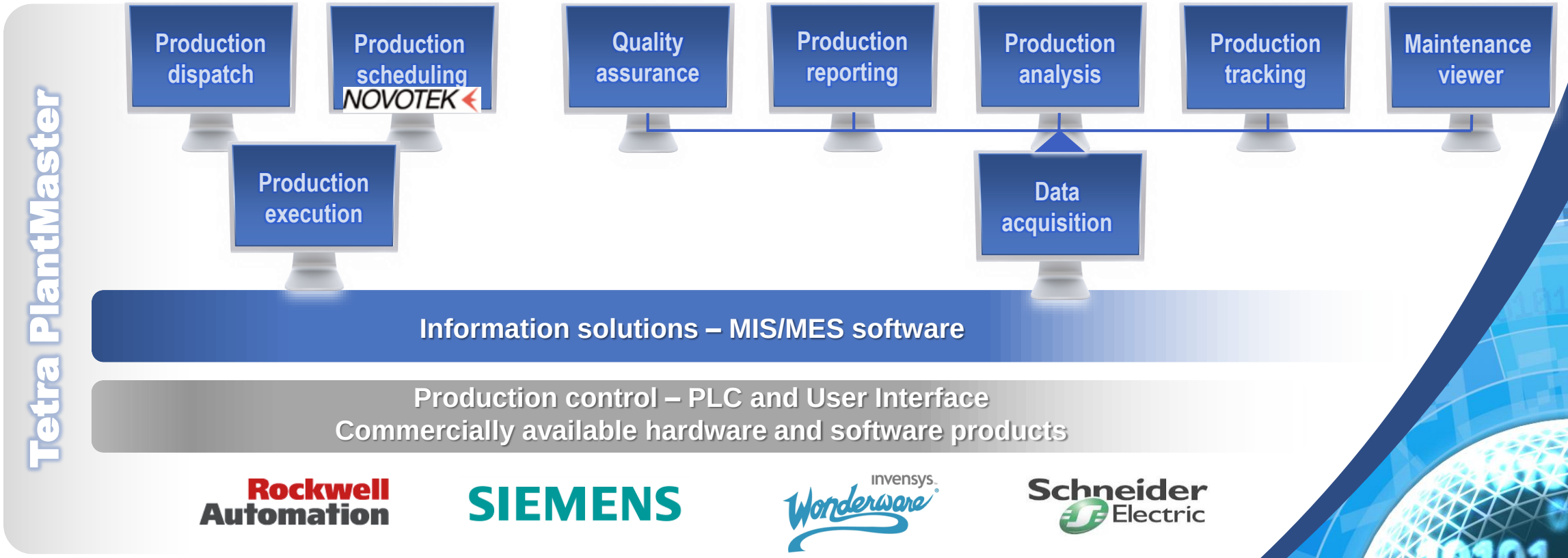
Our ambition with Tetra Pak plant automation platform

- The world class automation platform shall enable business growth and engineering efficiency
- Automation solutions delivered with the platform shall secure success for our customers during total life cycle

How?

1. Use commercial available systems and standards as far as possible
2. Build a system independent software model (S88 based)
3. Build & validate SW components, libraries and templates based on the software model

Plant Automation Platform used for Tetra PlantMaster solutions



Internal

Thanks for your attention

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