Is Automation Right for You?

Case Study on Cost Reduction through DC Automation, Process and IT Optimization

Sponsored by:

ioconsultants

Presented by:

Rupert Hoecherl

Senior Consultant, Logistics & Supply Chain Management

Marco Lederle

Operations Manager

ProMat 2013
AN MHIA INTERNATIONAL EXPO
McCORMICK PLACE CHICAGO JAN 21-24
www.ProMatShow.com

Content

- Introduction
- Challenges in Aftersales
- Case Study
  - Overview
  - Process
  - Automation
  - IT
- Timeline / Methodology
- KPIs and Summary

Introduction – Speaker Information
Marco Lederle

- Master of Science in Business Information Systems
- 9 years experience large scale IT Automation, Manufacturing Execution Systems (MES) and PCS (Process Control Systems and SCADA) projects within the BioPharm industry
- International experience from assignments in Europe, USA and Asia involving managing geographically distributed project teams working in a multi-cultural environment.
- Focus on Strategic Planning, URS/FRS development, EBR design and Project Management
- Currently serves as Operations Manager for the US office of i+o located in Bethlehem, PA.

Introduction – Speaker Information
Rupert Hoecherl

- Master of Science in Industrial Engineering
- 5 years of experience in large scale distribution center planning and supply chain management projects in aftersales and production related environments.
- International experience from assignments in Europe, USA and the Middle East involving managing geographically distributed project teams working in a multi-cultural environment.
- Focus on Strategic Planning, Implementation, Ramp-Up Support and Project Management.
- Currently serves as Senior Consultant in Logistics and Supply Chain Management for the US office of i+o located in Bethlehem, PA.

Introduction – Overview

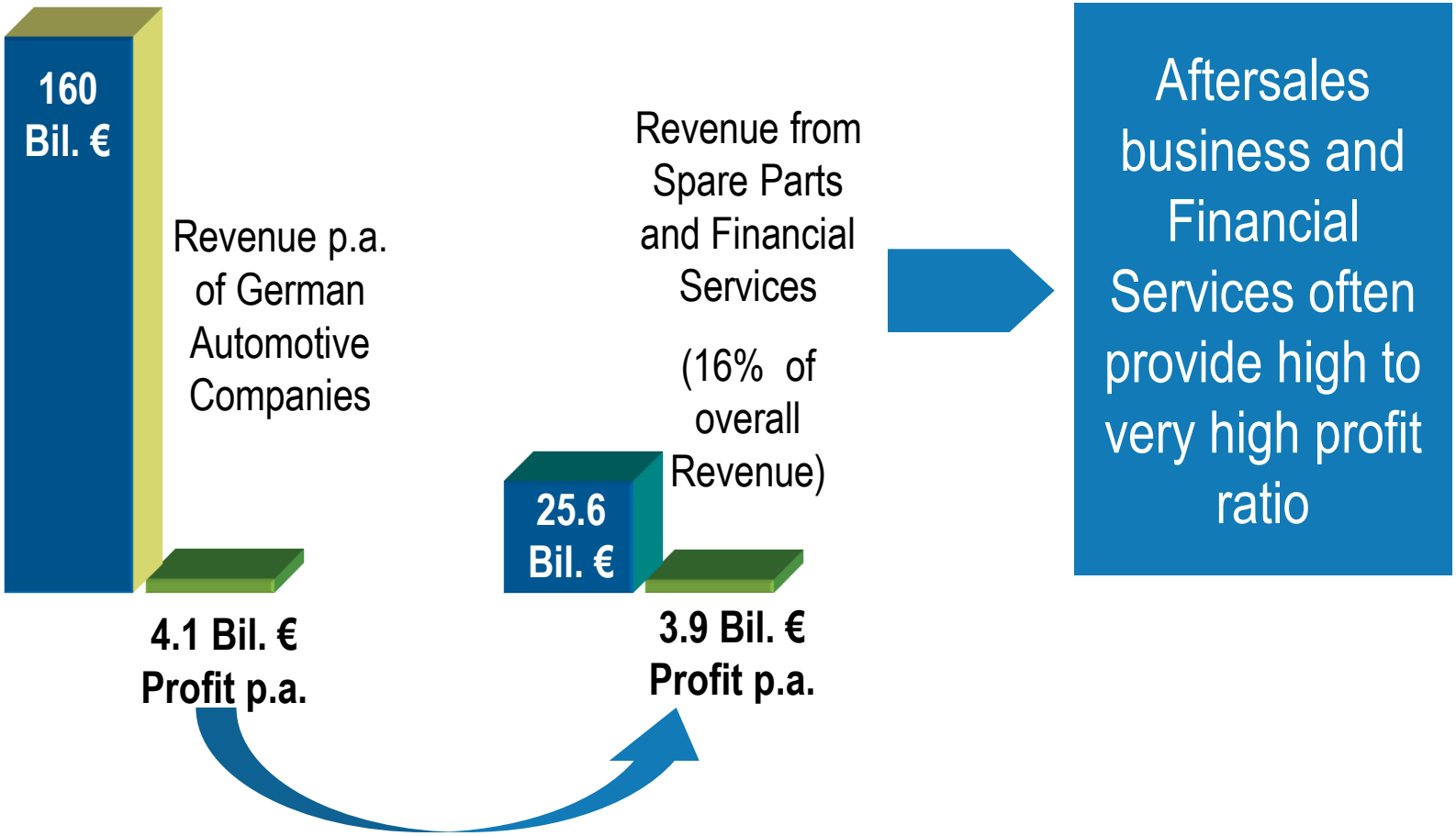
io-consultants - A Global Consulting Group

- io-consultants (www.io-consultants.com) is an international consulting group (established 1958) that provides services (Logistics, Supply Chain Management, IT Automation, Flight Catering) that are independent from software, hardware and solution providers

Case Study: Aftersales Logistics for Diesel Engines

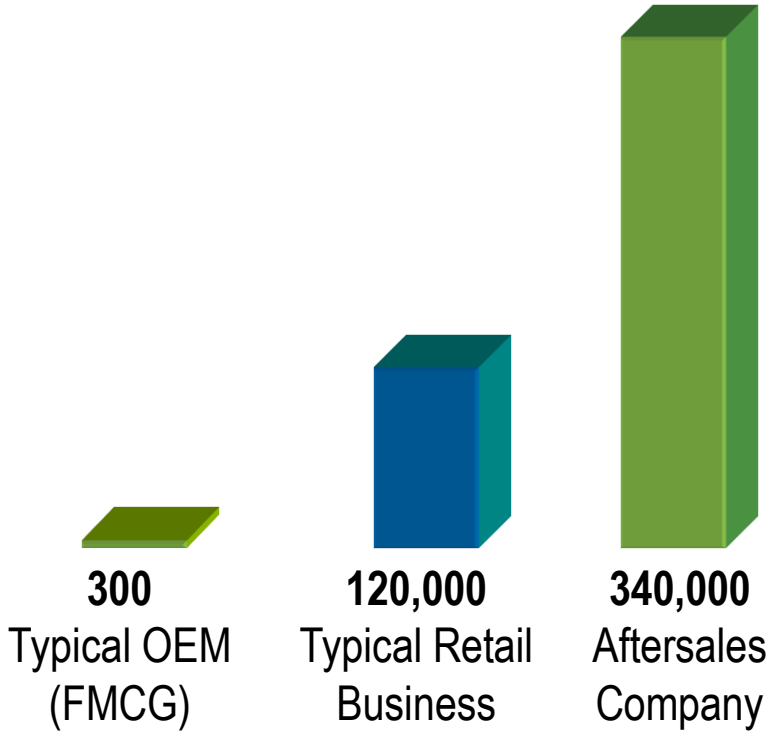
- Benchmarking through standardization
- Service requirements are increasingly global
- Keeping control of Aftersales Logistics

Why Aftersales is an Important Business



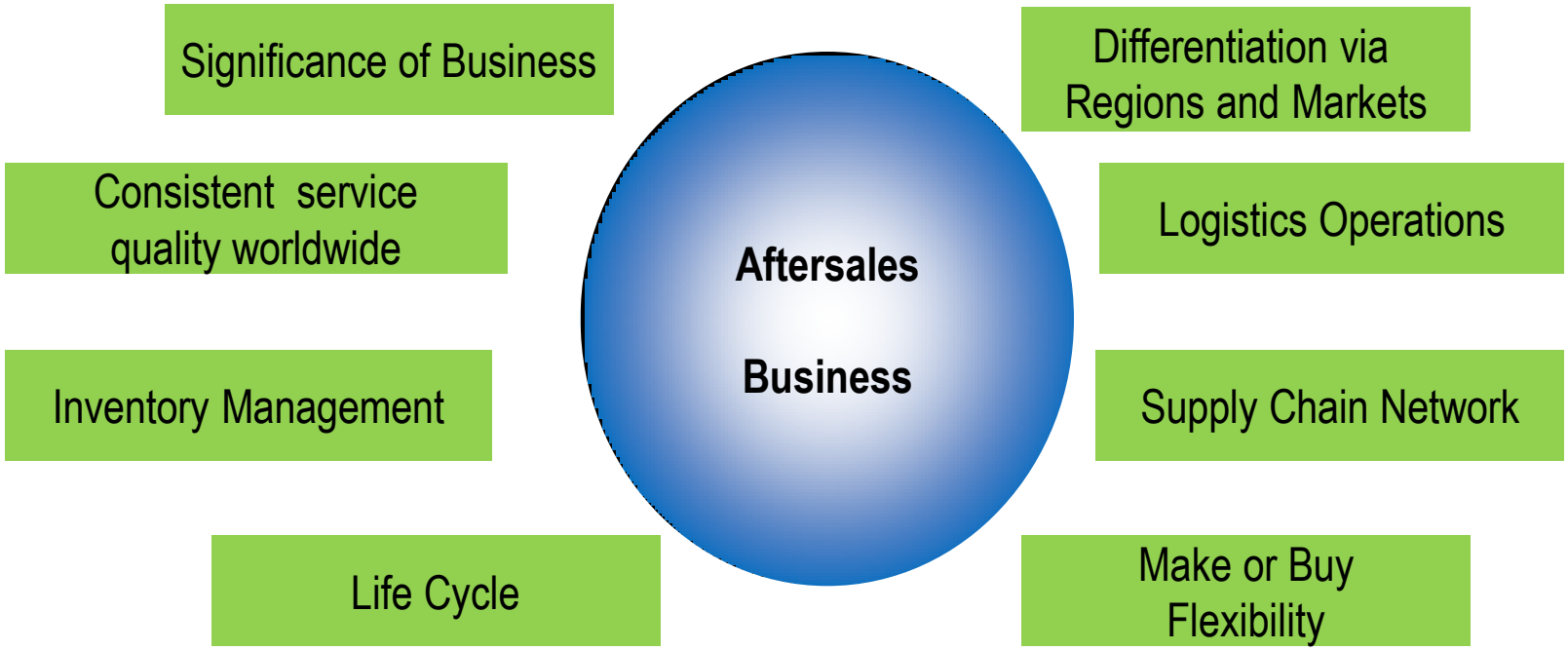
Typical Challenges for Aftersales Supply Chain

- Extremely high number of items (e.g. new models) often with low to zero pick frequency
- Inventory reduction vs. very high availability requirements (first-fill-rate)
- High customer service expectations (e.g. same-day delivery)
- Parts variety by size, weight & storage requirements
- Optimize the current logistical footprint and overall Supply Chain Network
- Prepare the business for future growth



Extraordinary number of different parts requires specific logistics

Aftersales Logistics in Focus



How to improve?

Case Study – Aftersales Logistics Starting Point

- Large engine manufacturer with global logistics operations in 3 distinct worldwide regions
- All regions operate as separate organizations, with different processes, systems (IT, Logistics) and locations
- North American operations was outsourced
- Renewal of contract was evaluated
- Expected increase in sales and customer service level (e.g. next-day delivery) would have not been able to be supported by 3PL
- Evaluation of processes from a global perspective

Case Study – Aftersales Logistics Starting Point

The decision was made to re-integrate all aftersales operations in-house for North America including:

- Setup of a new distribution center operation
- New IT System

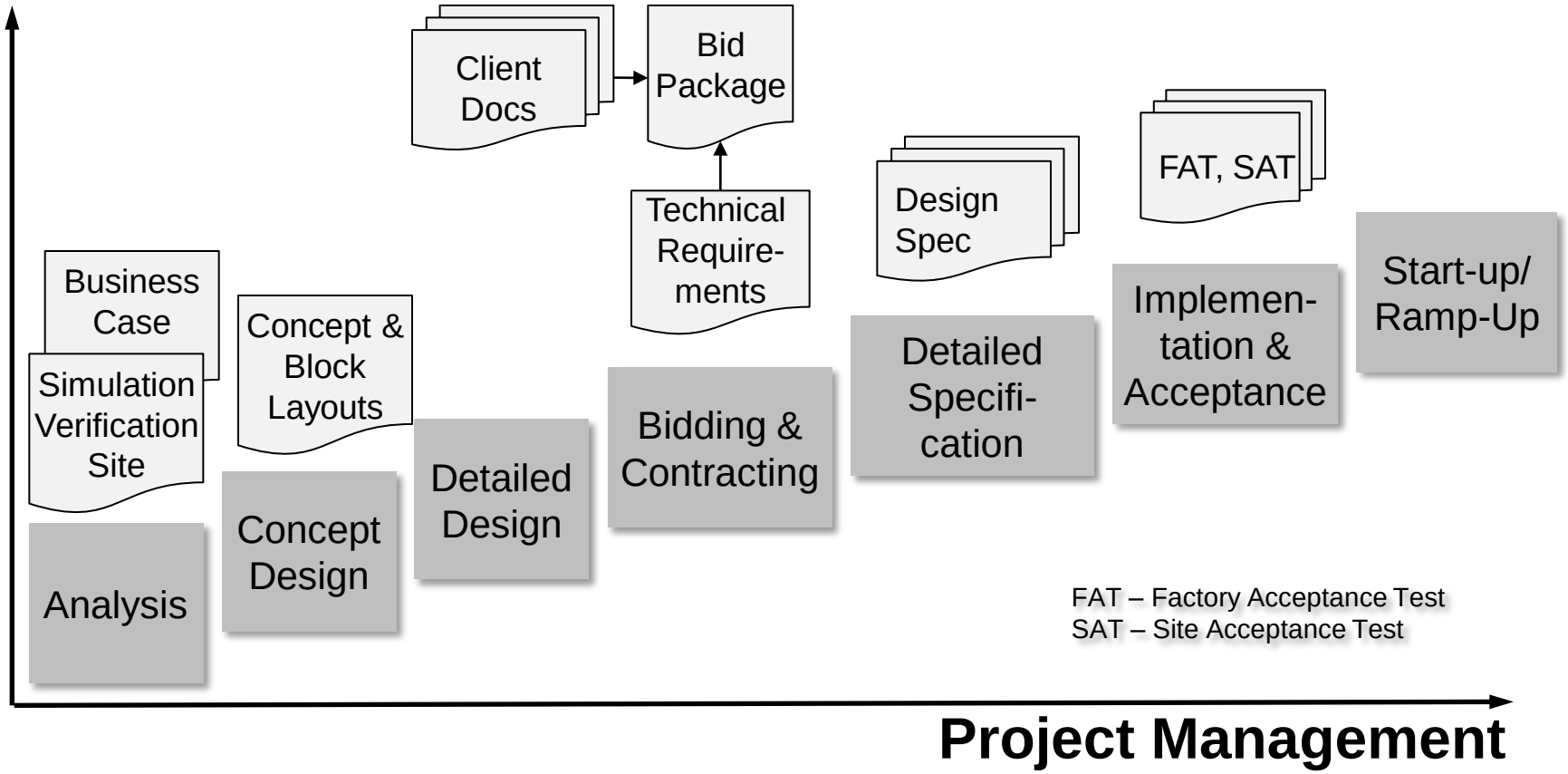
With the requirements of a global aftersales organization the following goals were defined:

- Standardized processes across all regions
- One global IT system
- Global standards in systems and operations

Case Study – Aftersales Logistics Starting Point: Facts & Figures

- Approx. 50,000 different SKUs from small o-rings to 12-ton crank cases
- Up-to approx. 3,000 order lines fulfilled daily
- Prepacking to streamline outbound process
- Conservation operations to protect material
- Kitting of more than 1,000 different kits produced in flexible Kit-to-Stock and Kit-to-Order process
- Picking strategy: work-to-man

Case Study
Project Approach

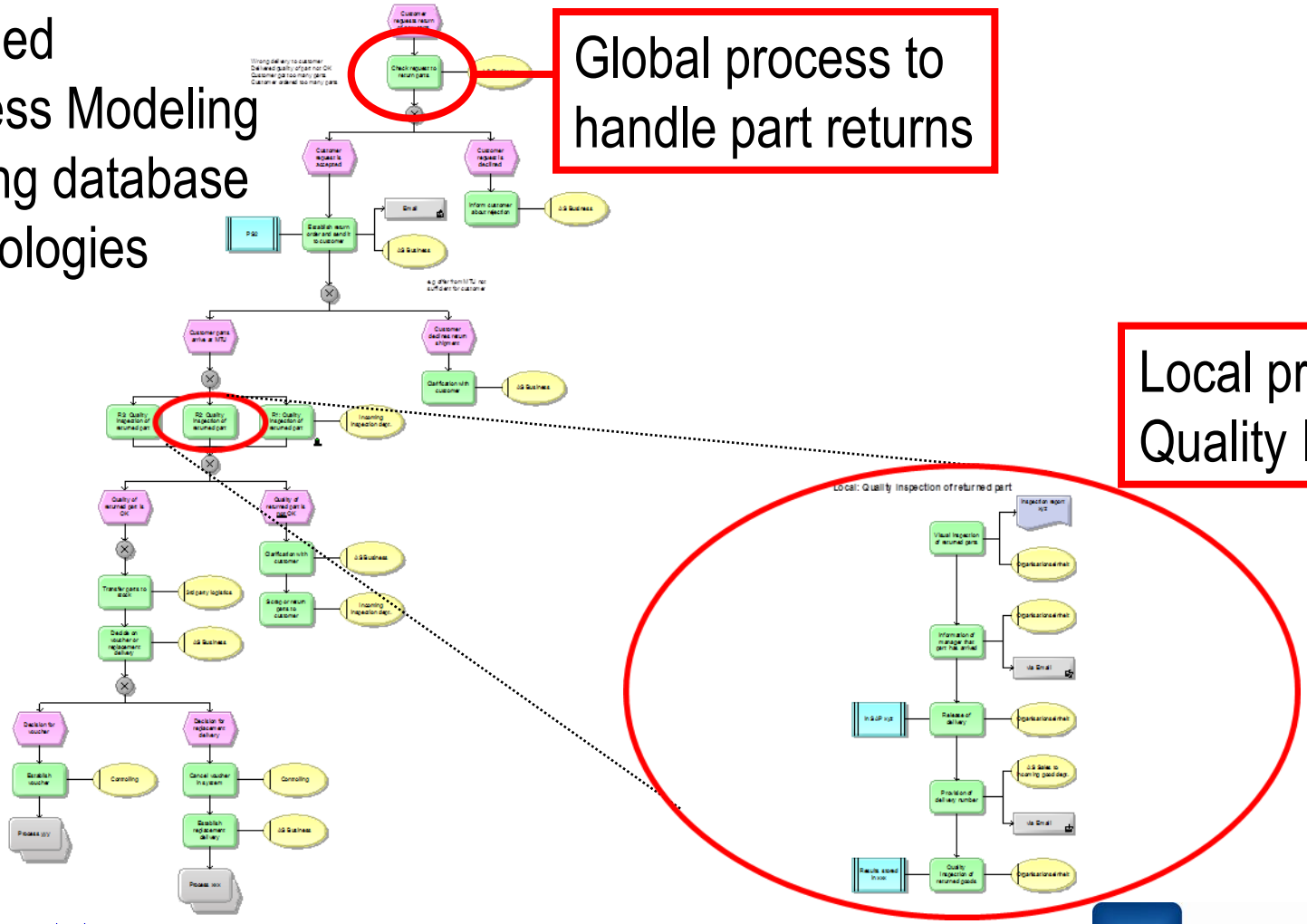


Case Study
Process Standardization

- Across 3 sites on 3 continents
- Global process template; local adjustments re-quired for special processes not present globally
- Dramatic changes to “used process“ required early change management and communication strategy
- Improved support and comparison (KPIs) on a global scale w/ comparable operations

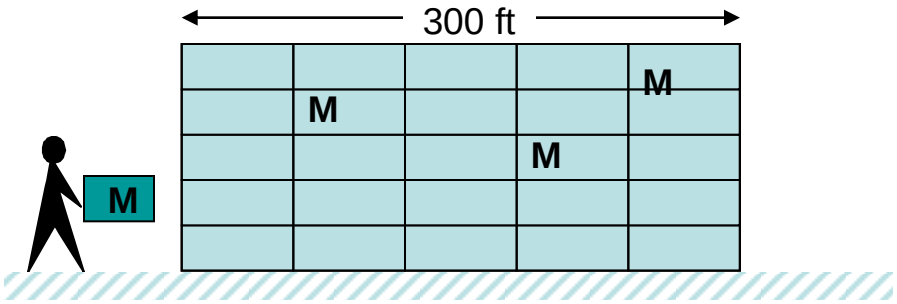
Case Study
Process Standardization

Detailed Process Modeling utilizing database technologies



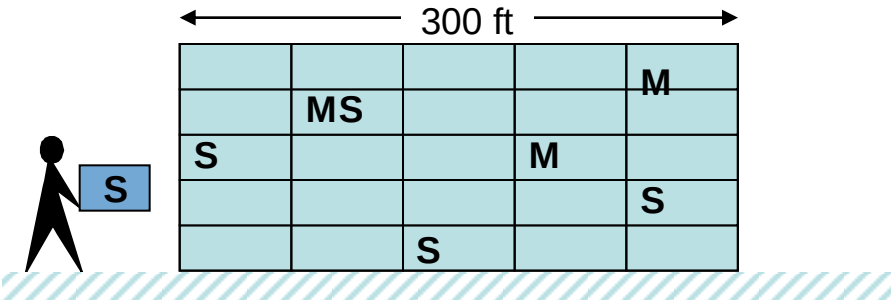
ioconsultants

Case Study
Order Picking Strategies (1)



1. Supermarket (M): $\frac{300\ ft.}{3Pos} = 100\ \frac{ft.}{Pos}$

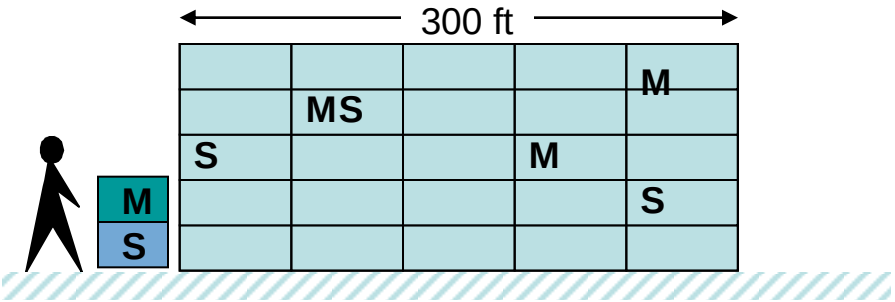
Case Study
Order Picking Strategies (2)



1. Supermarket (M): $\frac{300\ ft.}{3Pos} = 100\ \frac{ft.}{Pos}$

1. Supermarket (S): $\frac{300\ ft.}{4Pos} = 75\ \frac{ft.}{Pos}$

Case Study
Order Picking Strategies (3)

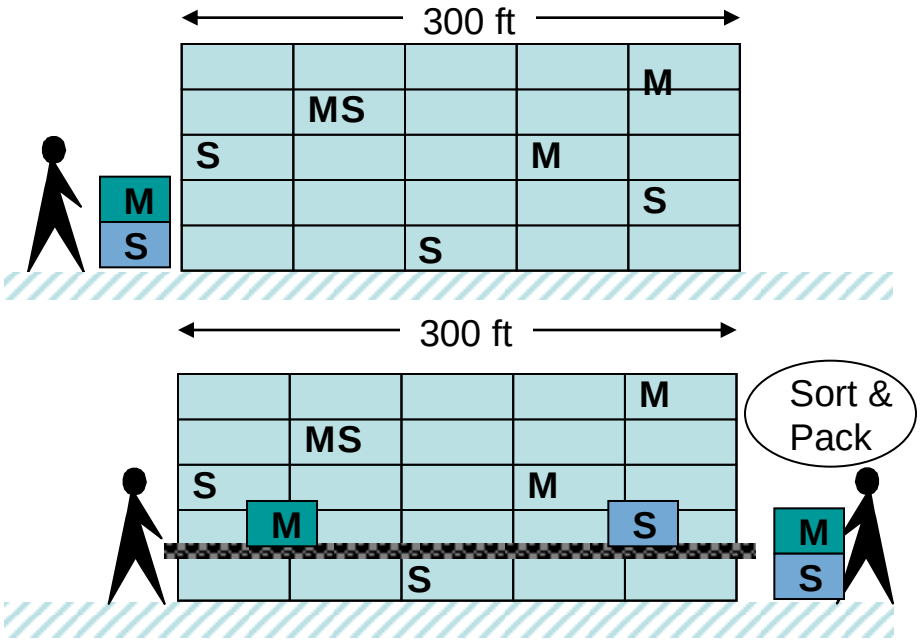


1. Supermarket (M): $\frac{300\ ft.}{3Pos} = 100\ \frac{ft.}{Pos}$

1. Supermarket (S): $\frac{300\ ft.}{4Pos} = 75\ \frac{ft.}{Pos}$

2. Multi-Order-Picking: $\frac{300\ ft.}{7Pos} = 43\ \frac{ft.}{Pos}$

Case Study
Order Picking Strategies (4)



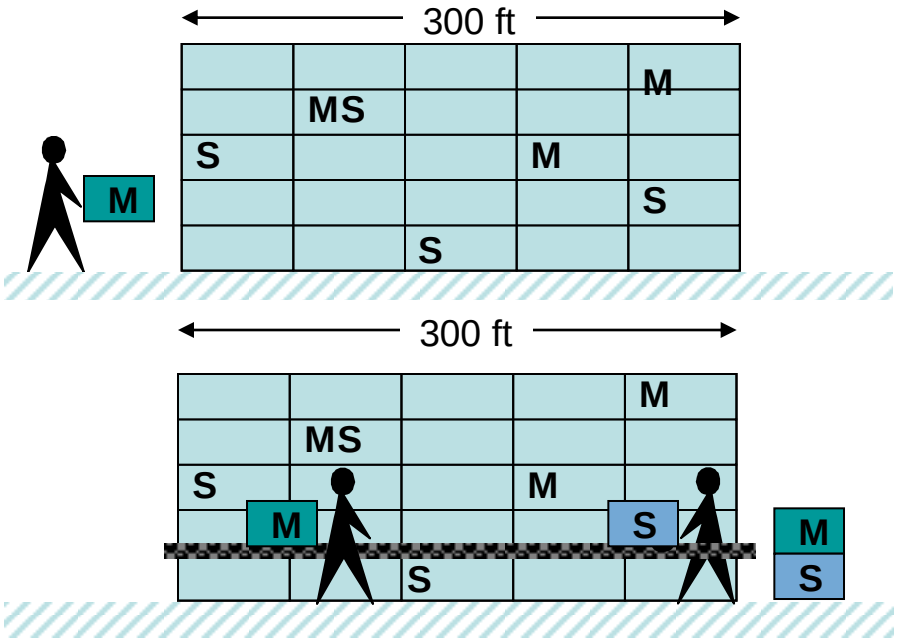
1. Supermarket (M): $\frac{300\ ft.}{3Pos} = 100\ \frac{ft.}{Pos}$

1. Supermarket (S): $\frac{300\ ft.}{4Pos} = 75\ \frac{ft.}{Pos}$

2. Multi-Order-Picking: $\frac{300\ ft.}{7Pos} = 43\ \frac{ft.}{Pos}$

3. Pick & Sort ➔ multiple order per tote

Case Study
Order Picking Strategies (5)



1. Supermarket (M): $\frac{300\ ft.}{3Pos} = 100\ \frac{ft.}{Pos}$

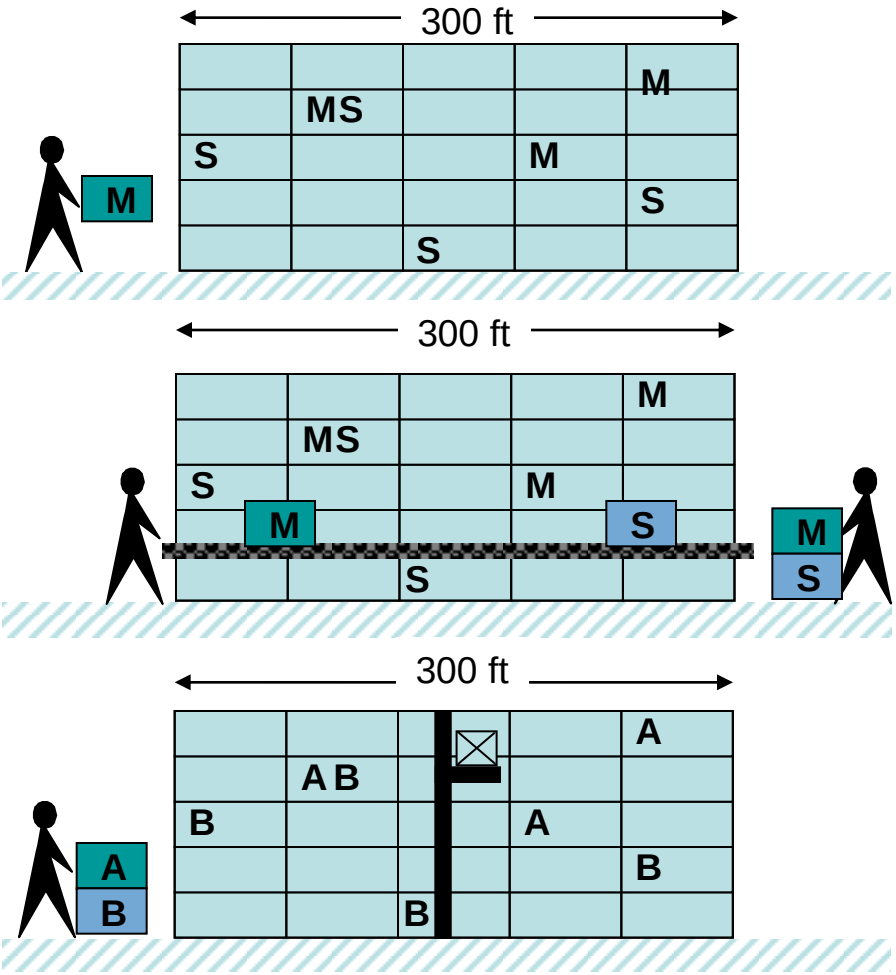
1. Supermarket (S): $\frac{300\ ft.}{4Pos} = 75\ \frac{ft.}{Pos}$

2. Multi-Order-Picking: $\frac{300\ ft.}{7Pos} = 43\ \frac{ft.}{Pos}$

3. Pick & Sort ➔ multiple order picking

4. Pick & Pass ➔ single order picking

Case Study
Order Picking Strategies (6)



1. Supermarket (M): $\frac{300\ ft.}{3Pos} = 100\ \frac{ft.}{Pos}$

1. Supermarket (S): $\frac{300\ ft.}{4Pos} = 75\ \frac{ft.}{Pos}$

2. Multi-Order-Picking: $\frac{300\ ft.}{7Pos} = 43\ \frac{ft.}{Pos}$

3. Pick & Sort ➔ multiple order picking

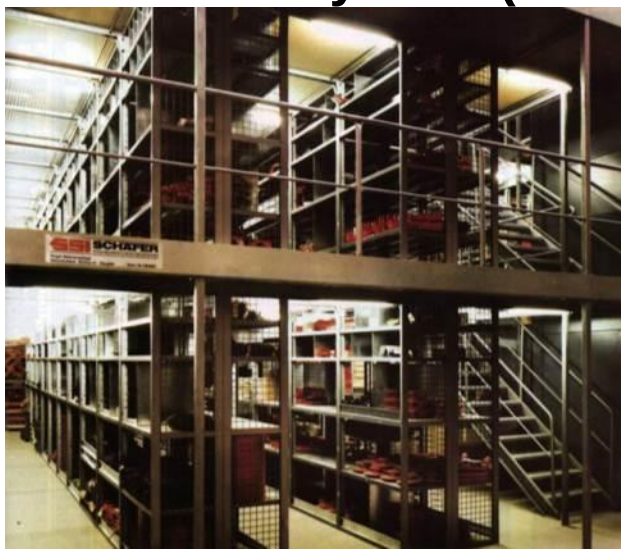
4. Pick & Pass ➔ single order picking

How do I determine the right solution for my application?

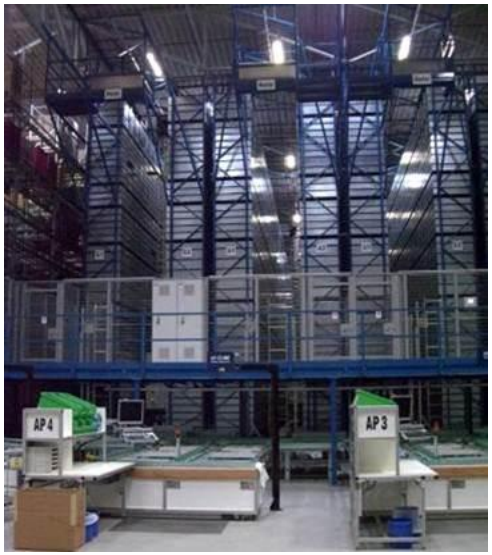
Case Study
Automated vs. Manual – Overview

- Goal is to determine the most suitable storage system for small and medium parts (up to 35lbs)
- Comparison of multi-order picking in a two-tier shelving systems vs. a work-to-man picking strategy in an automated stroage and retrieval system (AS/RS) loaded with trays (48in x 24in)

Manual Shelf-system (2-tier)

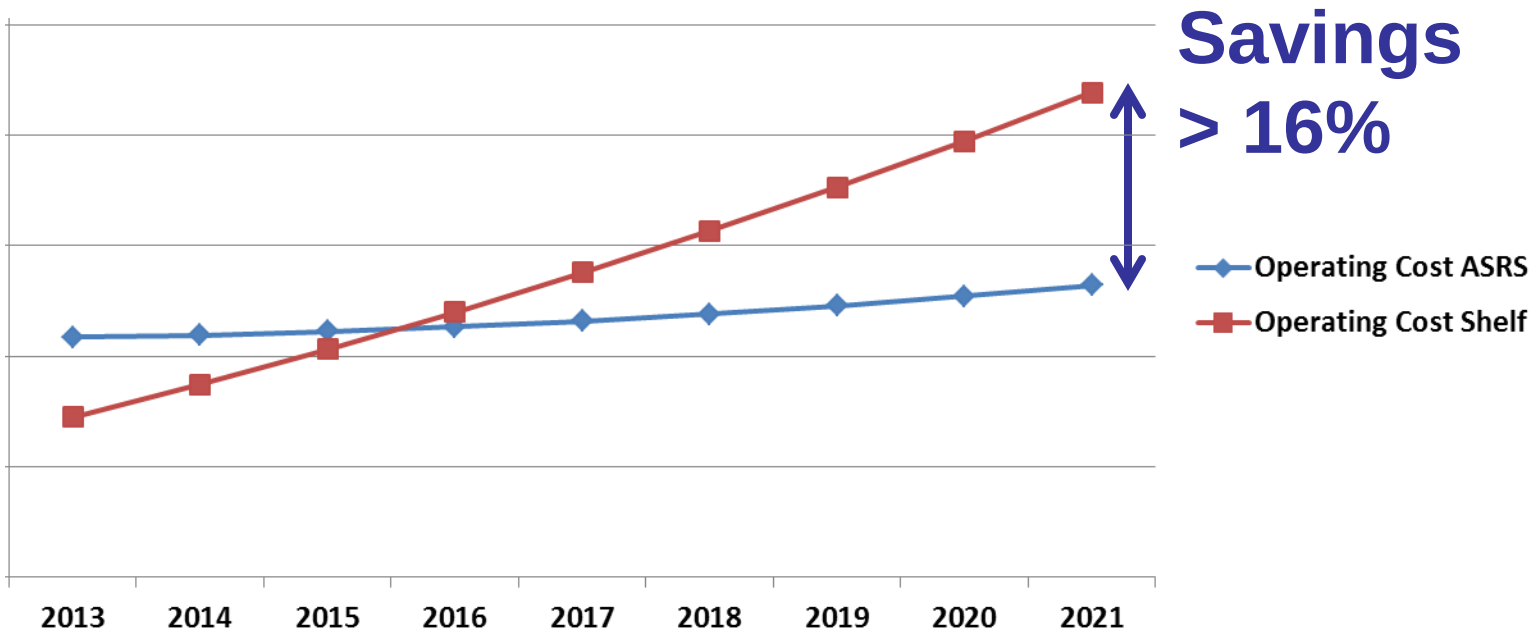


AS/RS – miniload



Case Study
Automated vs. Manual - Operating Cost

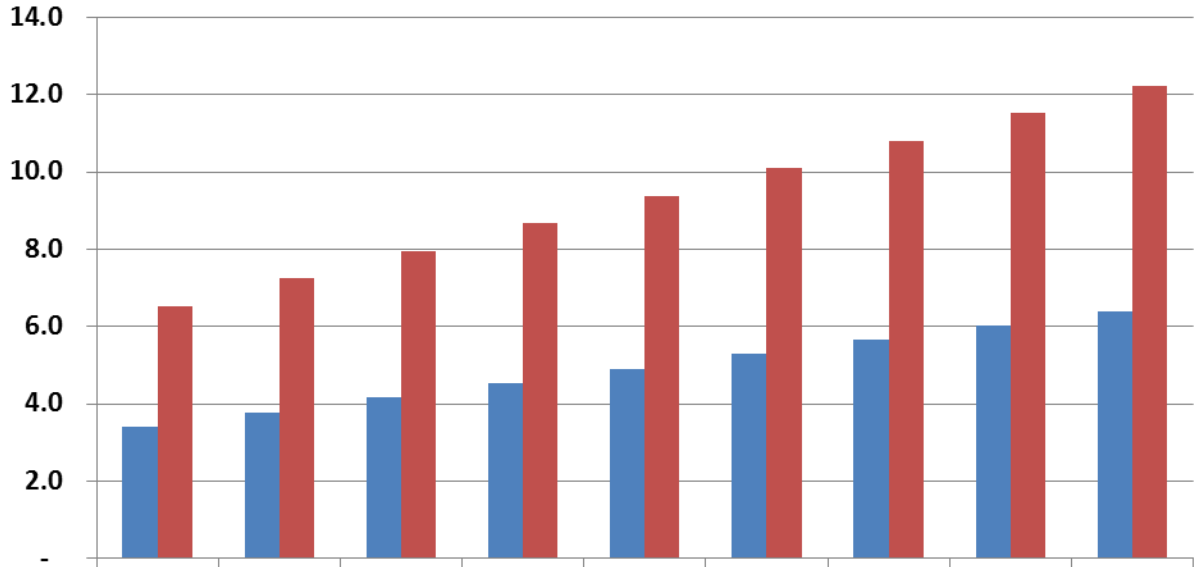
Graph shows annual operating cost including depreciation on construction cost and system invest from 2013 – 2021:



Break-Even in annual operating cost (including depreciation) is reached after approx. 3 years, providing annual savings of more than $170,000

Case Study
Automated vs. Manual – Headcount

Graph shows comparison of direct labor per system from 2013 – 2021:



	2013	2014	2015	2016	2017	2018	2019	2020	2021
FTE ASRS (direct labor)	3.4	3.8	4.2	4.5	4.9	5.3	5.7	6.0	6.4
FTE Shelf (direct labor)	6.5	7.2	8.0	8.7	9.4	10.1	10.8	11.5	12.2

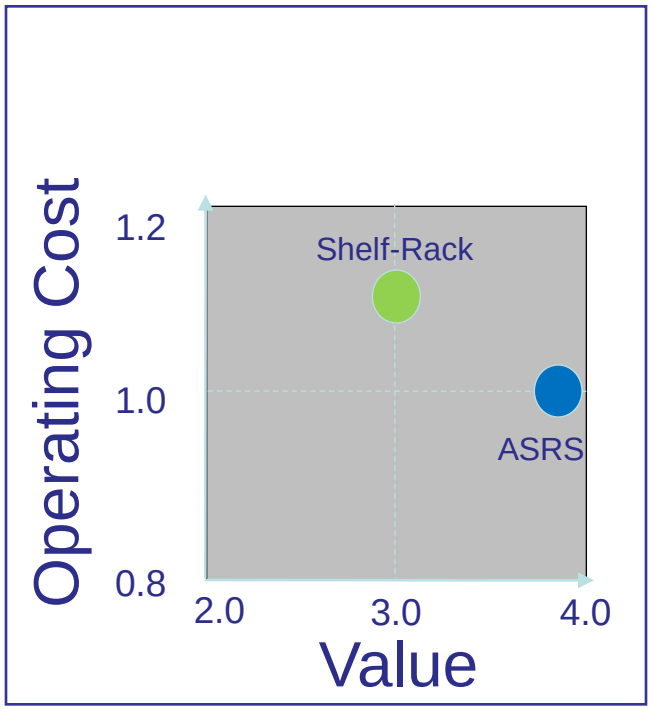
Based on current assumptions and expected increase in volume ASRS-system provides annual savings in labor of up to 5.8 FTE.

Case Study
Automated vs. Manual – Summary

Shelf-rack (2-level)	AS/RS
Advantages	**Advantages**
– Medium picking performance	– High picking performance
– High level of flexibility	– Effective space utilization
– Fail-safe-system	– Fully automated storage and retrieval processes
– Low maintenance-cost	– Very high picking accuracy
– Low IT-requirements (no subsystem /interface)	– Excellent ergonomics at picking stations
Disadvantages	**Disadvantages**
– Picker-to-part-principle	– Lack of flexibility
– Ineffective space utilization	– Difficult timeline
– High labor input	– High to very high invest
– Picking accuracy	– No access during breakdown
– Low ergonomics while picking	– Additional IT Requirements (Subsystem)
	– Special building requirements (e.g. floor)

Case Study
Site Comparison

	Value (qualitative comparison)	Operating Cost (normalized)
AS/RS	3.9	1.0
Shelf-Rack	3.0	1.1



Conclusion: The proposed automated storage and retrieval system is the preferred picking strategy for small and medium parts.

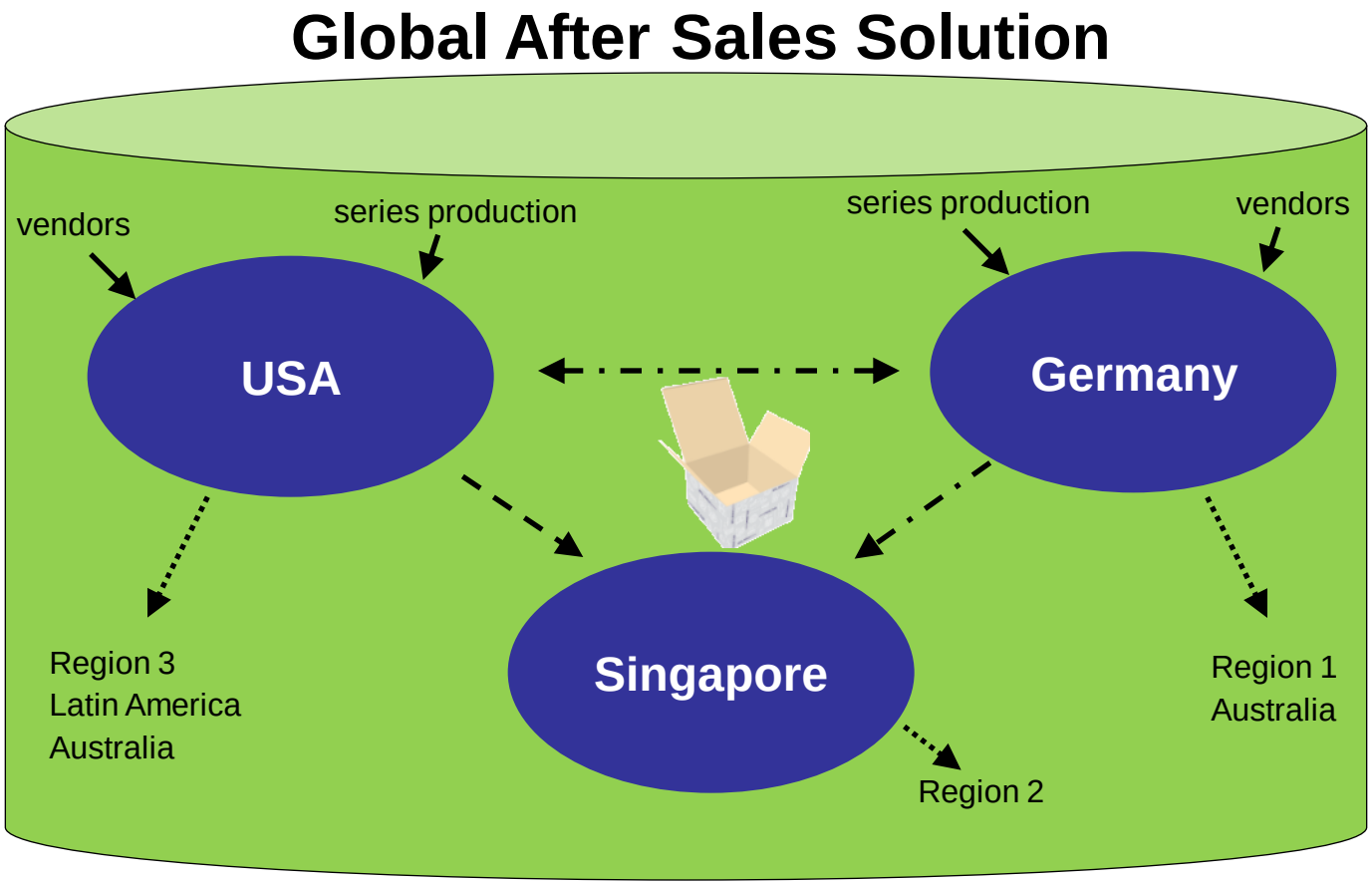
Case Study
IT Standardization

- Standardizied processes supported through a standard (global) IT system
- Global template with localization (e.g. Units of measure, language, finances, customs, special processes)
- One common platform ➔ better acceptance for user, faster roll-out for subsequent facilities, improved maintainability
- Reduction of interfaces and complexity
- Improved transparency of information

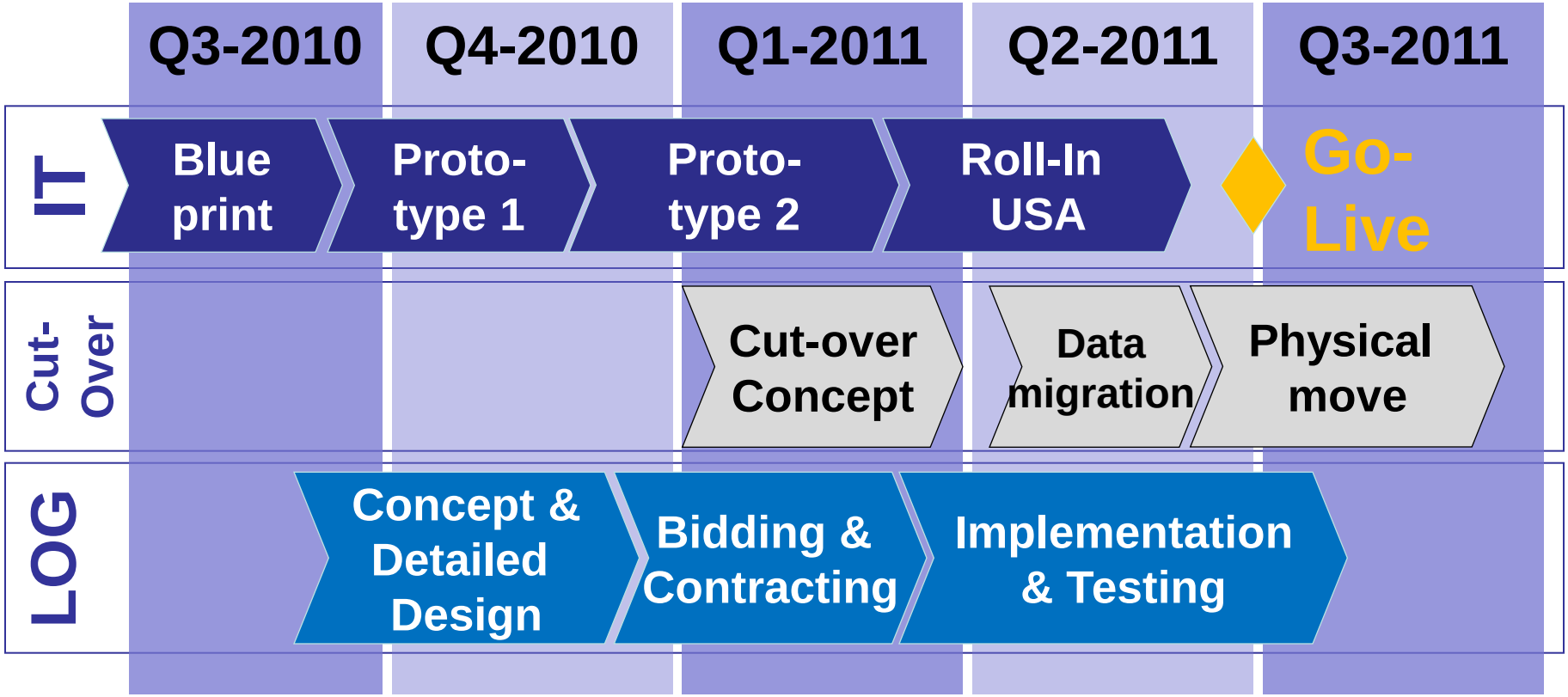
Case Study
Worldwide Inventory Management

3 Regions
3 Warehouses

1 globally harmonized planning and execution system

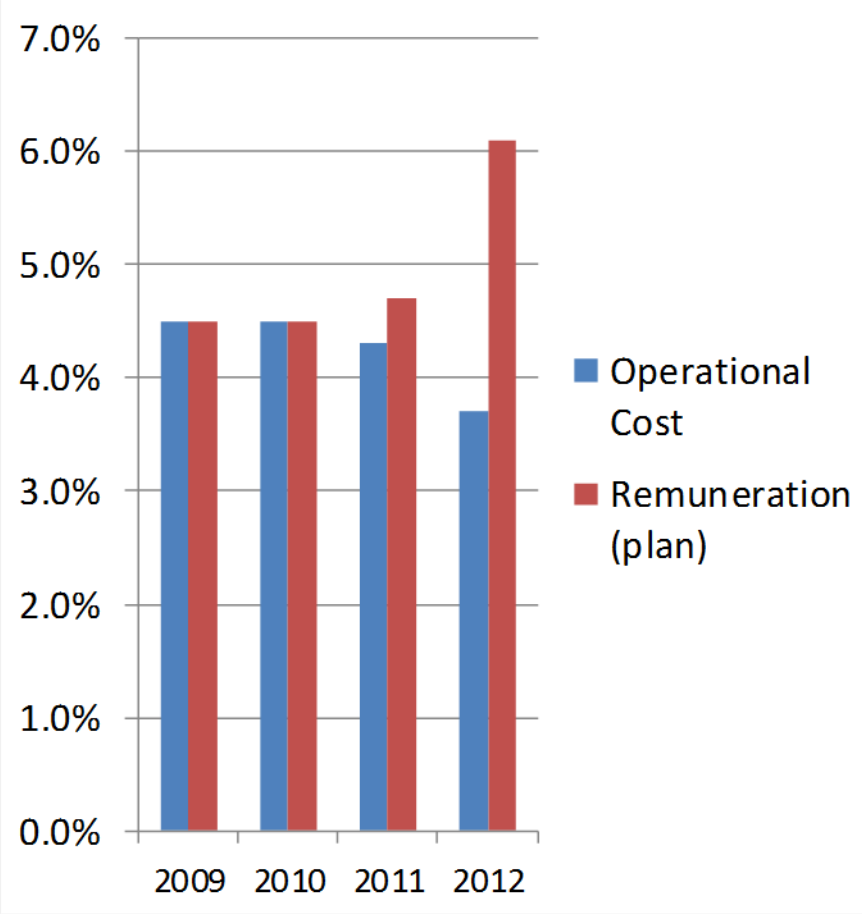


Case Study
Milestone Plan Integration



➔First part shipped, less than 13 Months after project kick-off

Case Study
Overall Logistics Cost



- Planned increase in remuneration shown as benchmark (red)
- Overall reduction of operational cost in first year of operation of approx. 9% against planned remuneration.
- Approx. 38% savings expected for 2012 against planned remuneration.

Case Study
Review of Goals

- ✓ Standardized Processes
  - Globally harmonized process template with
  - Individual localization for each region
- ✓ One global IT system (EWM)
  - Global stock visibility
- ✓ Standardized operations and systems
  - Pre-selection of systems for given application on global basis
  - Application to local requirements
- ✓ Reduction in overall logistics cost (as % of sales)

Summary and Lessons Learned

- Spare parts profitability is significantly affected by logistics costs
- Cultural differences pose challenge to worldwide projects
- Introduction of automation requires time to embrace all benefits
- Consistent worldwide processes facilitate cost effective operations and inventory management
- Standardized operations facilitate benchmarking

For More Information:

Speaker: Rupert Hoecherl
E-Mail: r.hoecherl@io-consultants.com

Speaker: Marco Lederle
E-Mail: m.lederle@io-consultants.com

www.io-consultants.com

Visit us at ProMat 2013 Booth # 4170