CIMCORP

Passion for optimized material flow

7.6.2018 Industry theme seminar at Pori
Use of business and system data for automation industry solutions and improvements

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Content

• Cimcorp introduction

• Data analysis in sales phase

• Data analysis when running the system

• Advanced data analysis

• Summary
Cimcorp Group

• Established in 1975
• Headquarters in Ulvila, Finland, subsidiaries in Canada and United States
• Global production and support facilities
• Member of Muratec (Murata Machinery, Ltd., Japan)
Mission
As the pioneers of automated solutions for intralogistics, we simplify our customers’ material flows.
Our customers
Retail & E-Commerce
Food & beverage Industry
Tire industry
Postal industry
### Total solution supplier

<table>
<thead>
<tr>
<th>ERP</th>
<th>Manufacturing/Warehouse Execution System (MES/WES)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Material flow control / Warehouse control / Warehouse management</td>
</tr>
</tbody>
</table>

**Image Description:**
- A series of images depicting various warehouse and manufacturing equipment, emphasizing the integration of ERP systems with warehouse management systems. The images show different aspects of automation and material flow control in a warehouse setting.

**Additional Information:**
- Date: 7.6.2018
- Location: Industry theme seminar at Pori
- Source: CIMCORP
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Logistics automation references
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Tire industry references
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Data analysis in sales phase
Sales process

Data analysis -> Concept design -> Layout / functional design

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Data analysis in sales process

Data
- Product data (SKU, size, weight, etc.)
- Order data (quantity, order ID, order line, delivery date, customer)
- Route data (order release time, departure time)
- Production data (own production, external production)

Analysis (=What is dimensioned?)
- Capacity
- Needed space and storage allocations
- Maximum day, peak hour, normal day
Dimensioning – Analysis

Average Values
- 16500 crates / day
- 107 orders / day
- 1428 orderlines / day
- 11.6 crates / orderline
- 110 products / day
- 530 crates / hour / robot
- Pallet pattern 6 x 7

Avg. Fill Workcycle Quantity = 2.411 / day

Avg. Full Product stack quantity = 1611 / day

Over 60 % of stacks straight through
Data Analysis – ABC analysis

ABC analysis

Cumulative share of CrateQty

ProductQty

CrateQty

Product

SplitCrateCrateQty
SplitStackCrateQty
MPFullStackCrateQty
CnvFullStackCrateQty
PalletCrateQty

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Data Analysis – Order profile

65% of orders are 100 crates or more

Orders with 200 crates or less form 50% of total volume in crates
Data Analysis – Departure profile

Departure hour profile by CrateQty
Data analysis when running the system
Statistics obtained from running system

- Automation investments are important for our customers
- They have to meet the ROI requirements and competition forces them to develop their processes continuously
- Cimcorp systems are delivered with some basic statistics system
- Customer can buy more options to get more detailed data
- With these tools, customers can analyse performance of the automation systems and compare effect of changes made to processes
Utilization of a robot

Drivetime %

Utilization %

Time

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Utilization of a robot in different tasks
Outfeed capacity of subsystem

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Pieces and stacks out

Value

Time

Stacks

Time

Tires

Pieces out

Stacks out
Advanced data analysis
The role and importance of software in general will keep increasing as it has been doing for a long time.

Industrial IoT, big data and analytics related functionalities will increase:
- MES, predictive maintenance, production effectiveness, etc.

Improved user experience:
- More mobility, context awareness, augmented reality, better troubleshooting, multi-site functionality, etc.

Big Data
Industry 4.0
Internet of Things
Mobility
Analytics
Augmented Reality
Multi-site functionality
Machine learning
Sensors

• Different kind of sensors needed

• Automation systems have already many sensors

• Separate measuring systems

• Challenges:
  – Interfaces
  – Time synchronization
Data analysis algorithm

- Algorithm creation is challenging
- Before setting the rules you need some exceptions
- Analysis types:
  - History analysis
  - Prediction
  - Real-time prediction
Data analysis – advanced

- Data becomes useful when it is analyzed
- Goal for analysis is to create useful conclusions from data
- Simplest analysis is made by human
- Automatic analysis is made by computer algorithms
- Highest level of analysis is artificial intelligence – AI
- Data amount → performance challenges → Edge computing
Cimcorp MES

- MES is abbreviation from terms **Manufacturing** Execution **System**.

- MES is system for production planning, controlling, tracking and reporting

- It keeps track of all manufacturing information in real time

- The goal of MES is to increase productivity, improve quality and reduce cycle-time

- MES scope is one factory level manufacturing

- MES is manufacturing specific tool between ERP and production automation

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ANSI/ISA-95 standard

| LEVEL 4: | Establishing the basic plant schedule – production, material use, delivery and shipping. Determining inventory levels
| Time frame: Months, weeks, days |

| LEVEL 3: | Work flow, recipe control to produce the desired end products. Maintaining records and optimising the production process.
| Time frame: Days, shifts, hours, minutes, seconds |

| LEVEL 2: | Monitoring, supervisory control and automated control of the production process.
| Time frame: Minutes, seconds |

| LEVEL 1: | Sensing the production process and manipulating it.
| Time frame: Minutes, seconds, milliseconds |

| LEVEL 0: | The actual production process.
| Time frame: Minutes, seconds, milliseconds |

**Business Planning and Logistics**
(Plant Production Scheduling, Operational Management, etc.)

**Manufacturing Operations Management**
(Detailed production scheduling, dispatching production, reliability assurance, etc.)

**Batch Control**
**Continuous Control**
**Discrete Control**

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Summary
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- Analyzing customer’s order data is the first step to design automating material handling process.

- Software to control automated process can provide data and analysis to improve customer’s operation.

- Larger amount of detailed data obtained from sensor input and advanced tools such as machine learning can be used for improved service in the future of automation industry.
Passion for optimized material flow.
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