# Enabling Industry 4.0

## The future role of IT in the industry

Klaus Hardy Mühleck. Darmstadt, October 9th, 2014



Developing the future.

ThyssenKrupp

# Content


1 Introduction ThyssenKrupp

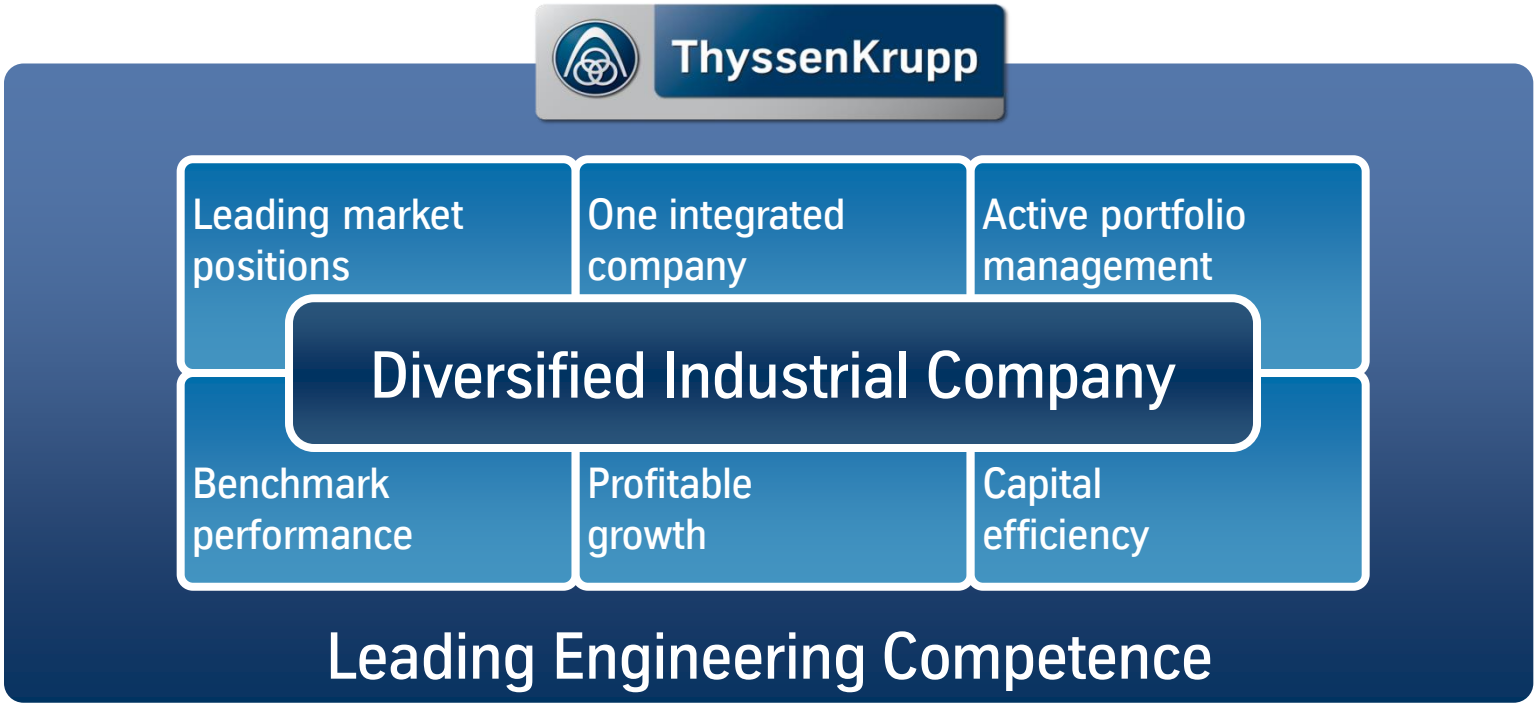
2 Focus of IT at ThyssenKrupp

3 Outlook: The future role of IT

# Content

1. Introduction ThyssenKrupp
   - Introduction ThyssenKrupp group
   - Current challenges in the industry
   - Current role of the IT
2. Focus of IT at ThyssenKrupp
3. Outlook: The future role of IT

# ThyssenKrupp – Diversified Industrial Group



# Leading engineering expertise supports global sustainable progress

| Drivers | Demand ("more") | Business opportunities | Demand ("better") | Restrictions |
|---|---|---|---|---|
| Demography  | More consumer and capital goods | Leading engineering expertise in Material Mechanical Plant | Reduced $CO_2$ emissions, renewable energies | Climate change  |
| Urbanization  | More infrastructure and buildings | | Efficient infrastructure and processes | Finite resources  |
| Globalization  | More resource and energy use | | Efficient resource and energy use, alternative energies | Political framework  |

# Diversified industrial group: Our business areas

## Key indicators – fiscal 2012/2013*



### Components Technology

| | |
|---|---|
| Sales (€ mill) | 5,712 |
| EBIT** (€ mill) | 244 |
| Employees | 27,737 |



### Elevator Technology

| | |
|---|---|
| Sales (€ mill) | 6,155 |
| EBIT** (€ mill) | 675 |
| Employees | 49,112 |



### Industrial Solutions

| | |
|---|---|
| Sales (€ mill) | 5,641 |
| EBIT** (€ mill) | 640 |
| Employees | 18,841 |



### Materials Services

| | |
|---|---|
| Sales (€ mill) | 11,700 |
| EBIT** (€ mill) | 236 |
| Employees | 26,978 |



### Steel Americas

| | |
|---|---|
| Sales (€ mill) | 1,867 |
| EBIT** (€ mill) | (495) |
| Employees | 4,112 |



### Steel Europe

| | |
|---|---|
| Sales (€ mill) | 9,620 |
| EBIT** (€ mill) | 143 |
| Employees | 26,961 |

* Continuing operations (after reclassification of Steel Americas) before consolidation
** Adjusted before consolidation

# Examples of our capabilities

## Material

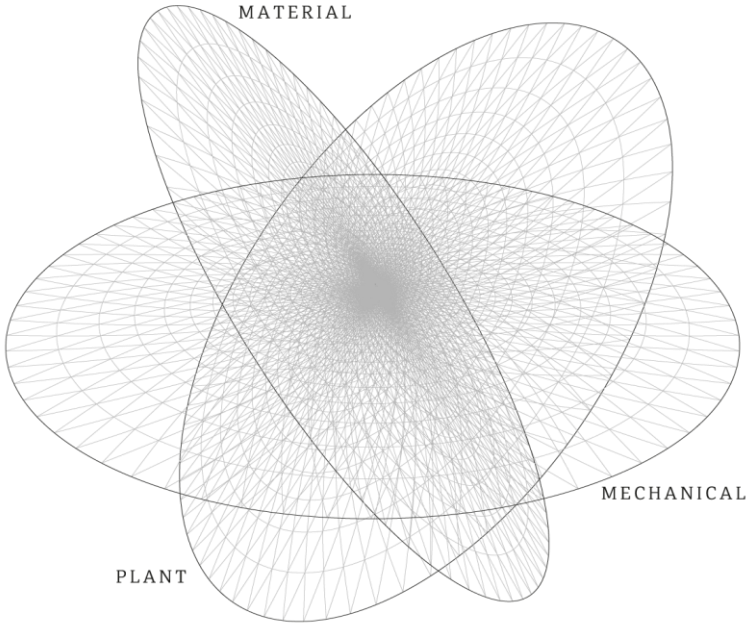
- Customer-specific material solutions
- Efficient materials manufacturing and processing
- Material services on the basis of powerful IT and logistics systems

## Mechanical

- Design and manufacture of components for the automotive, machinery, energy and construction sectors
- Design, production and servicing of elevators, moving walks and escalators

## Plant

- Planning and construction of plants and machinery for the raw material and chemical industries
- Global engineering and service network



# Content

1. Introduction ThyssenKrupp
2. Focus of IT at ThyssenKrupp
   - Current status
   - Main chances & challenges
   - Business needs driving the change
   - Why is transformation necessary?
   - How do we manage the transformation?
3. Outlook: The future role of IT

# ThyssenKrupp – Strategic Way Forward

Diversified industrial company → Company Positioning → More & Better Sustainability

## Change Management

- Mission Statement
- Governance
- Code of conduct
- Leadership
- ACT: Network organization
- Transparency
- Compliance
- Systems & processes

## People Success

- Employee survey
- Leadership Competencies
- HR Global 2020
  - Change to perform
  - Lead to engage
  - Enable to grow
- HR empowerment

## Performance Orientation

- Active portfolio management
- Continuous benchmarking
- Profitable growth
- Cost control
- Capital efficiency
- Cash generation

## Customers & Markets

- Brand ThyssenKrupp
- Market intelligence
- Sector strategies
- Customer relationships
- Sales excellence

## Financial Stability

- Balanced portfolio
- Significant cash flow
- Low net financial debts
- Investment grade
- Sustainable equity situation

## Strategic Push

- White/adjacent spaces
- Anorganic growth: Acquisitions
- Organic growth: Expand market positions
- Strengthen innovation & technology

impact

# Group IT Strategy derived from Company Positioning

Diversified industrial company

**Company Positioning**

More & Better Sustainability

- Change Management
- People Success
- Performance Orientation
- Customers & Markets
- Financial Stability
- Strategic Push

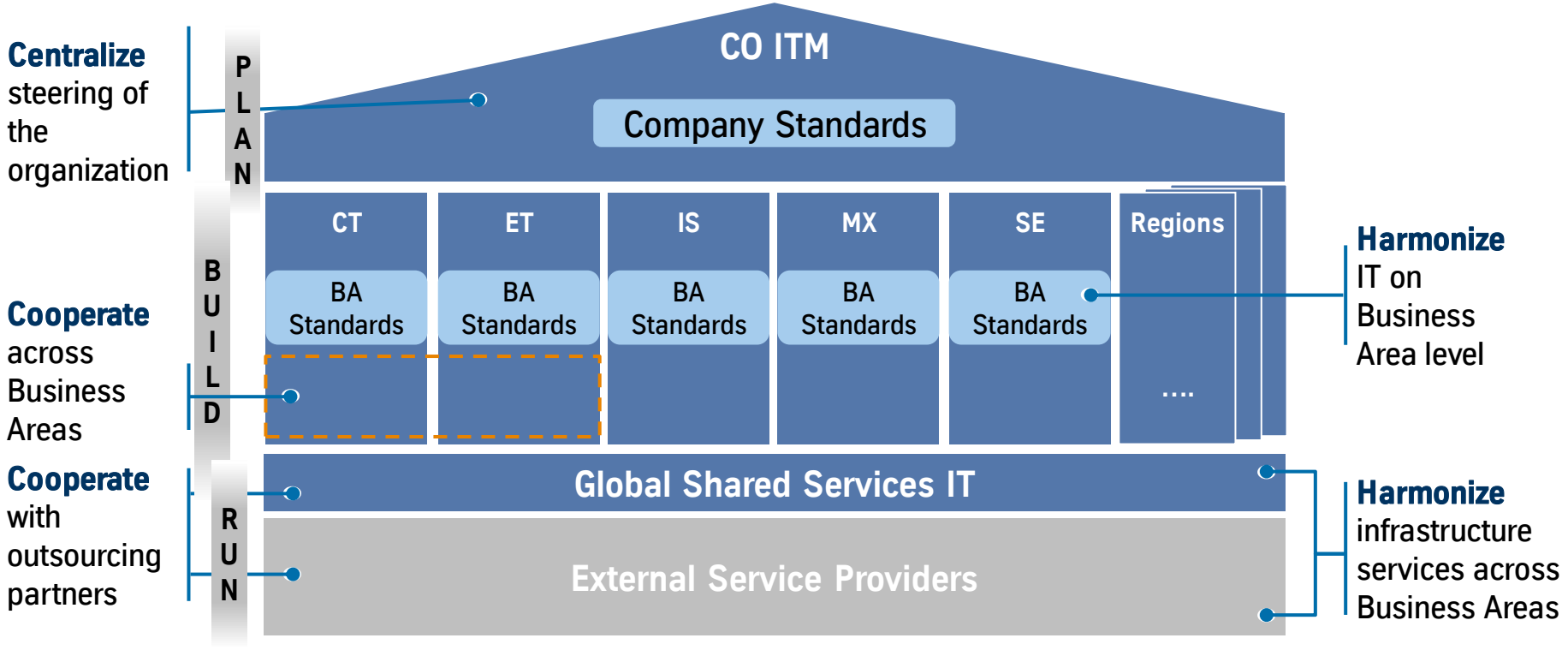
Digitalization of Business

**Group IT Strategy**

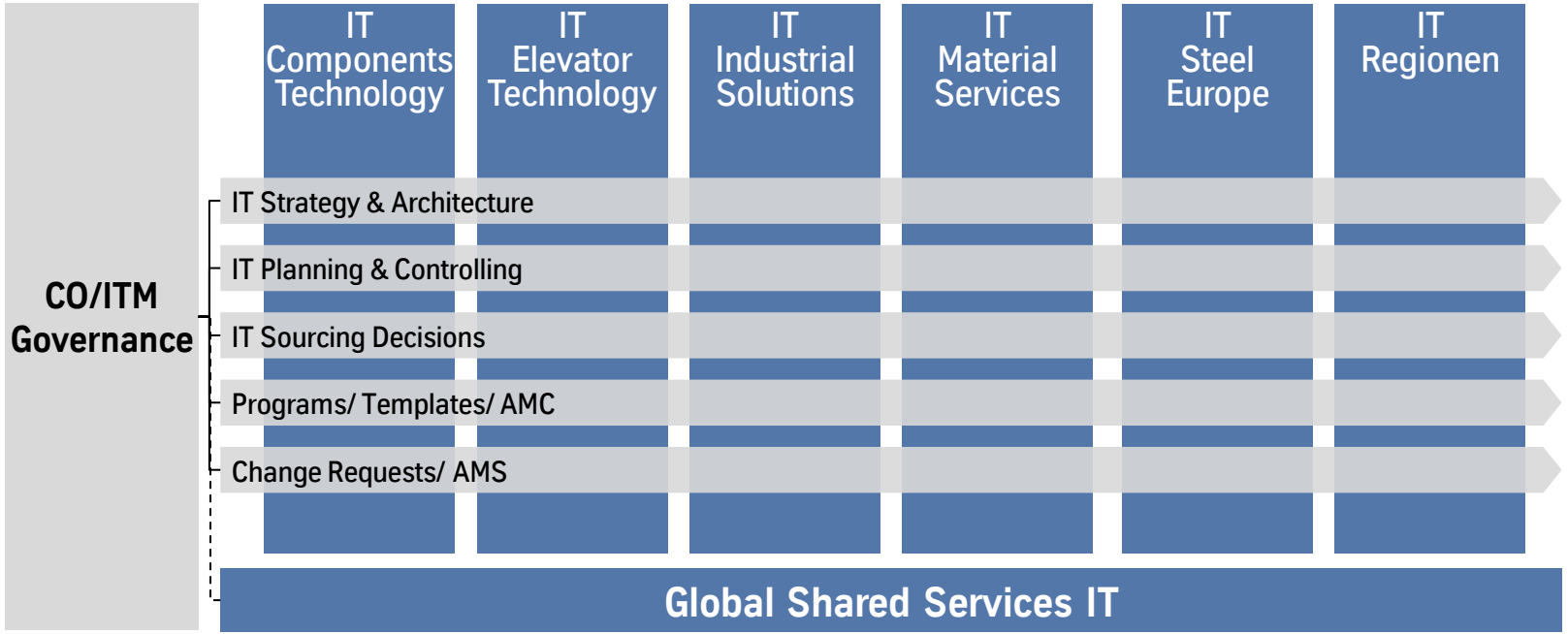
Perform & Continue Improvement

- Consolidate IT Infrastructure, Data & Processes
- Foster Industry 4.0 ecosystem
- Global collaboration & exchange
- Follow Cloud Platform Strategy
- Handle large-scale Data & Analytics
- Joint IT Service Proposition

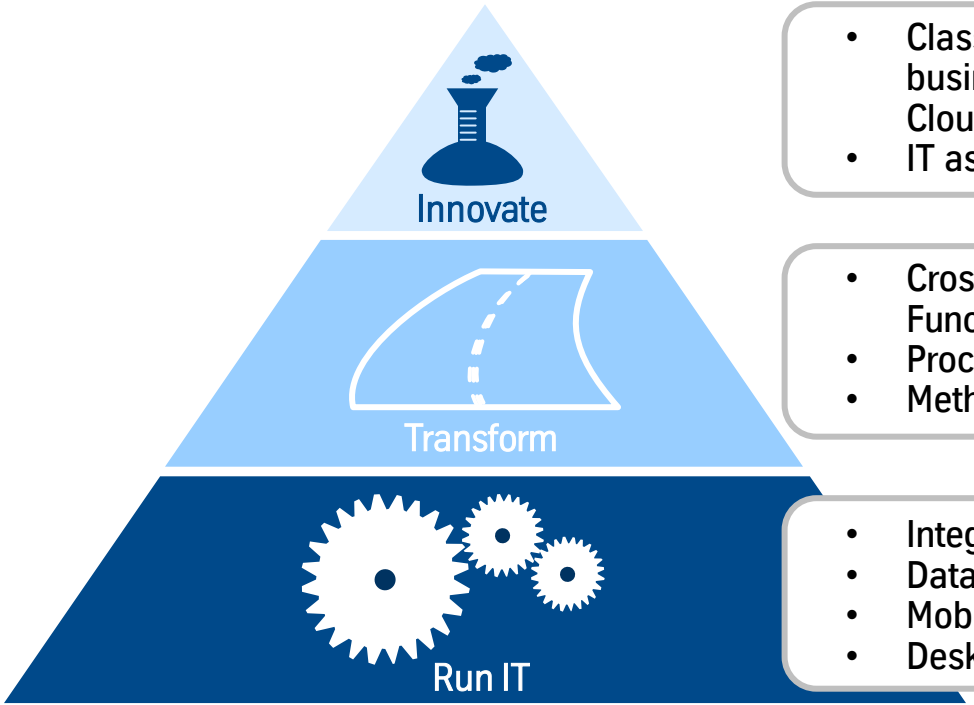
# Transformation and Harmonization of IT Organization



# Transformation: ThyssenKrupp IT Management Matrix and Governance



# Business needs driving the Change

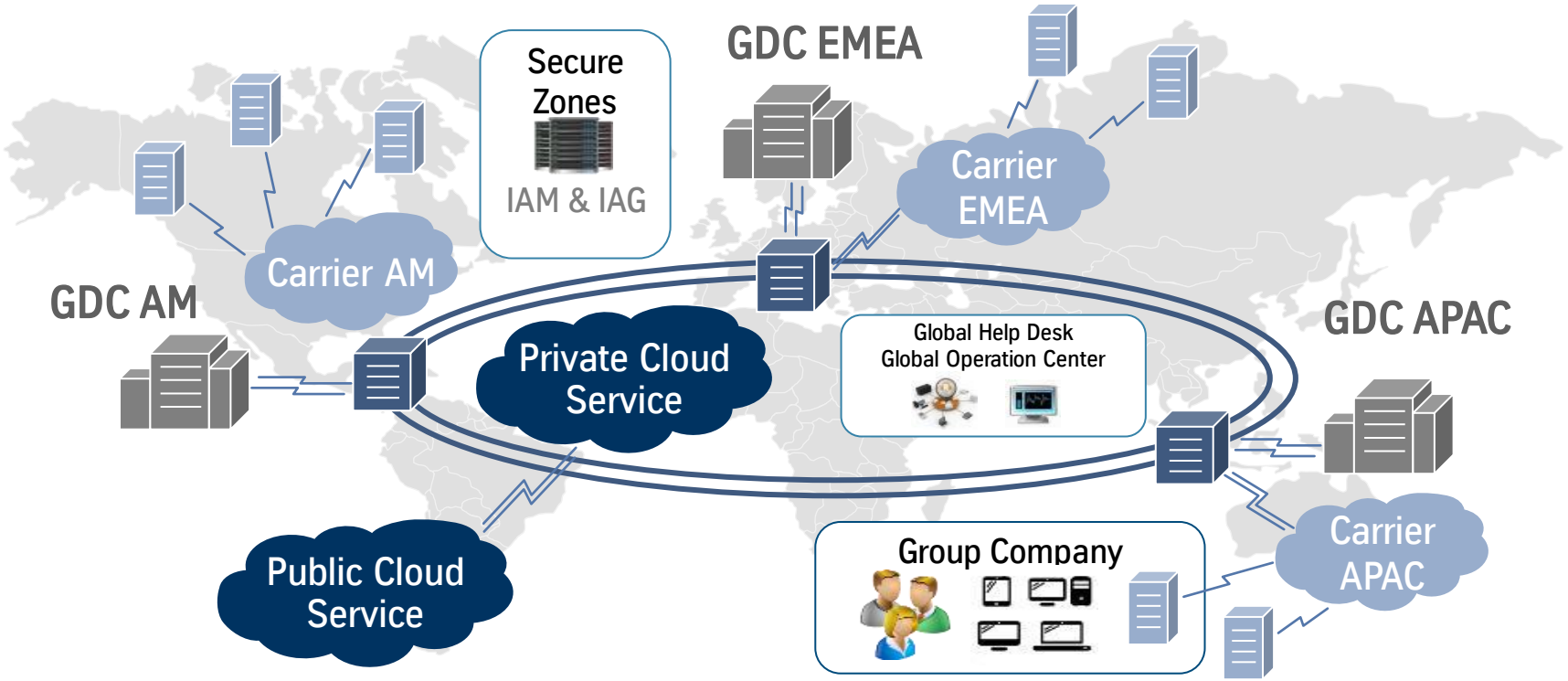



- Classic industry vs. digital business (e.g. Cooperation 4.0, Cloud Computing)
- IT as a product or within a product

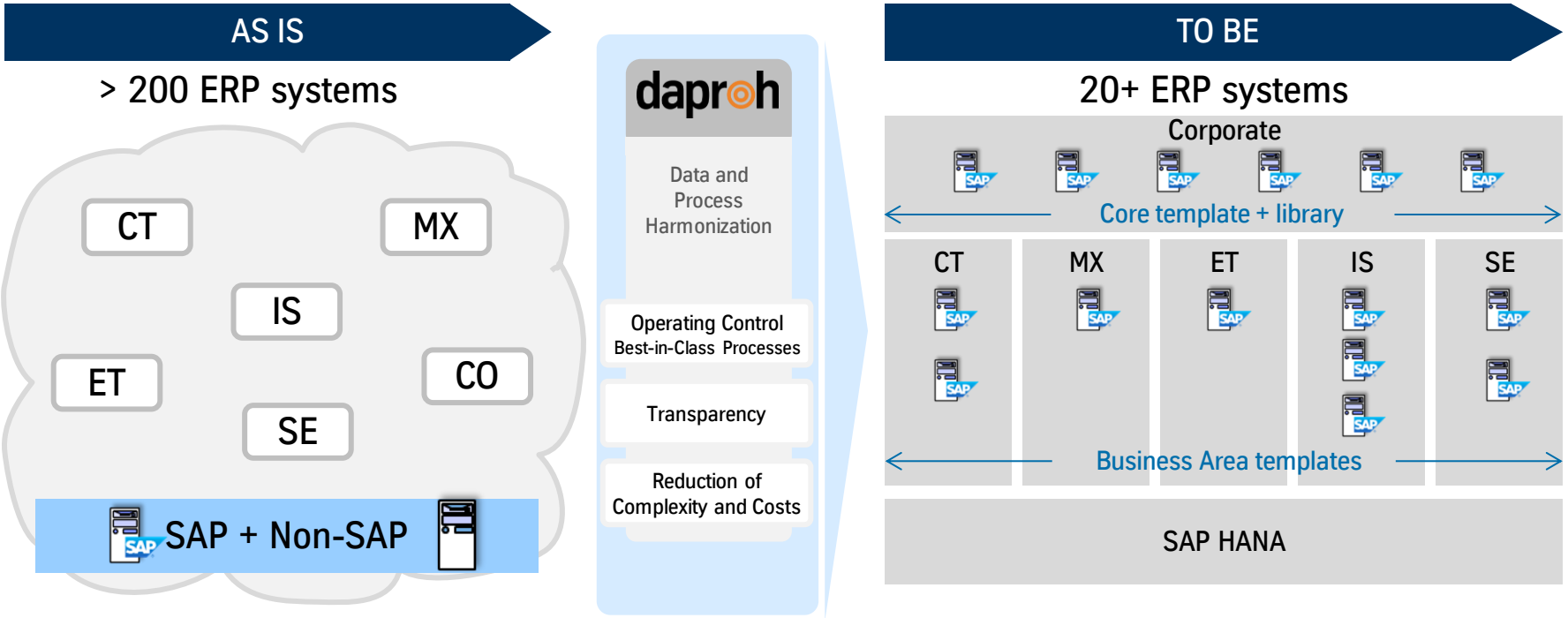
- Cross-linking the Corporate Functions with IT solutions
- Process, added value
- Methods of IT design

- Integrated network
- Data center
- Mobile communication
- Desktop, Printers

# Example “Infrastructure Consolidation”



# ThyssenKrupp SAP Landscape



# Content

1. Introduction ThyssenKrupp
2. Focus of IT at ThyssenKrupp
3. Outlook: The future role of IT
   - How does the new IT look like
   - Chances to be taken: examples for enabling the business
   - Outlook to innovative IT: technology enabling industry

# Group IT Strategy derived from Company Positioning

Diversified industrial company

**Company Positioning**

More & Better Sustainability

- Change Management
- People Success
- Performance Orientation
- Customers & Markets
- Financial Stability
- Strategic Push

Digitalization of Business

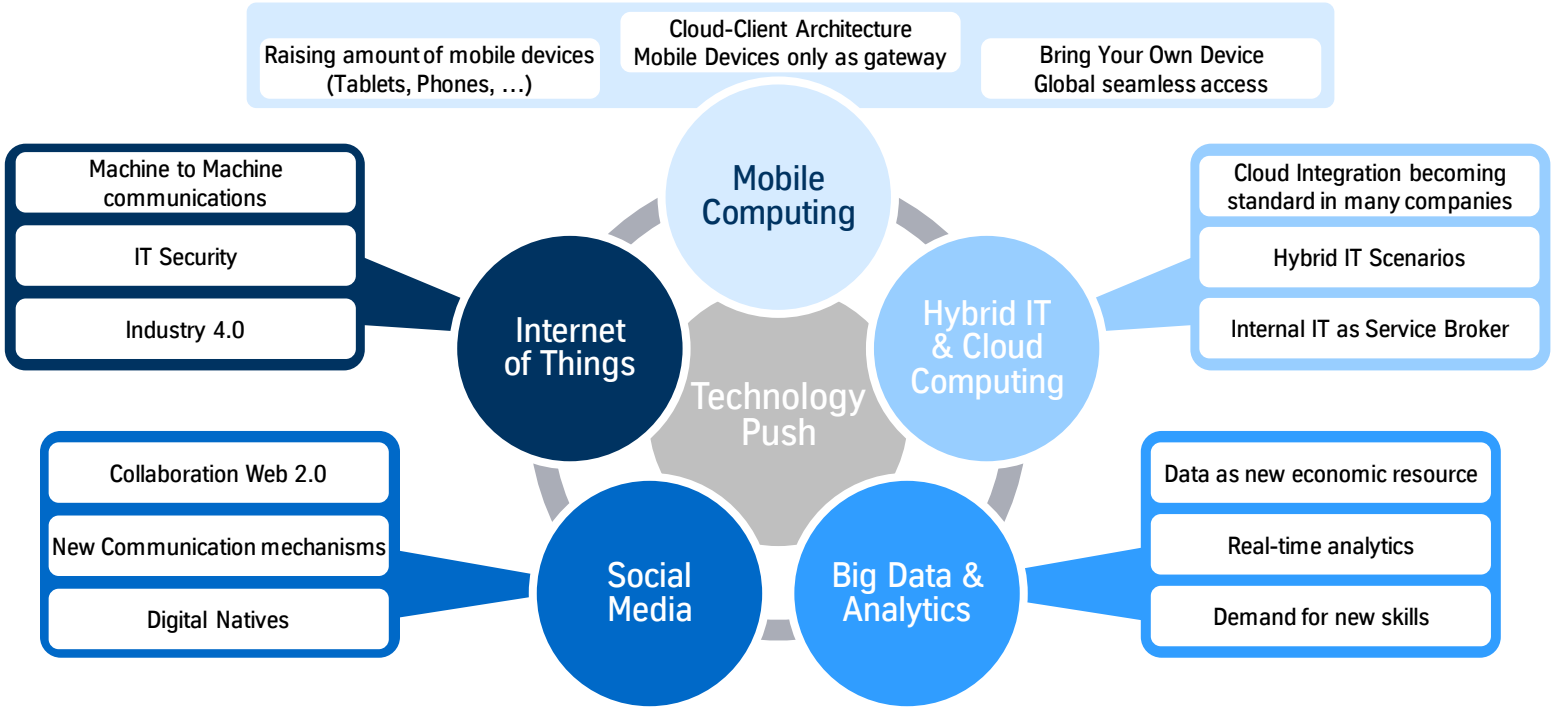
**Group IT Strategy**

Perform & Continue Improvement

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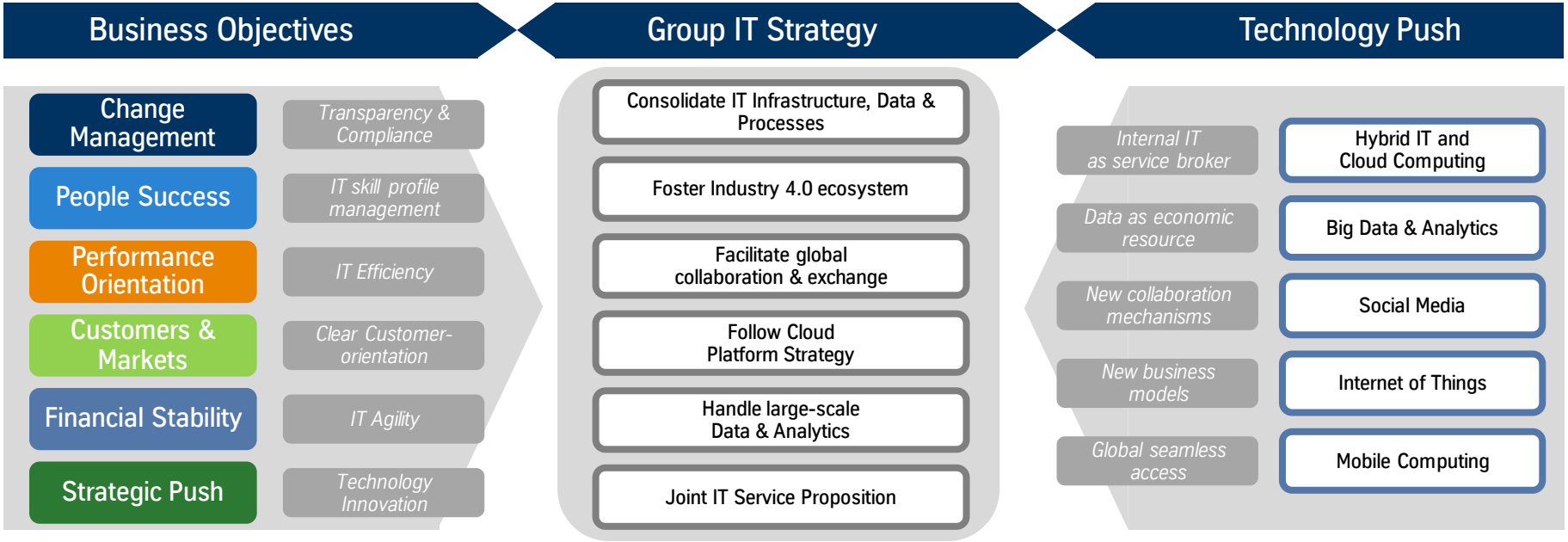
# Technology Push

## Gain competitive advantage by exploiting new technologies



# Group IT Strategy derived from Business Objectives

## Gaining competitive advantage by innovating new technologies

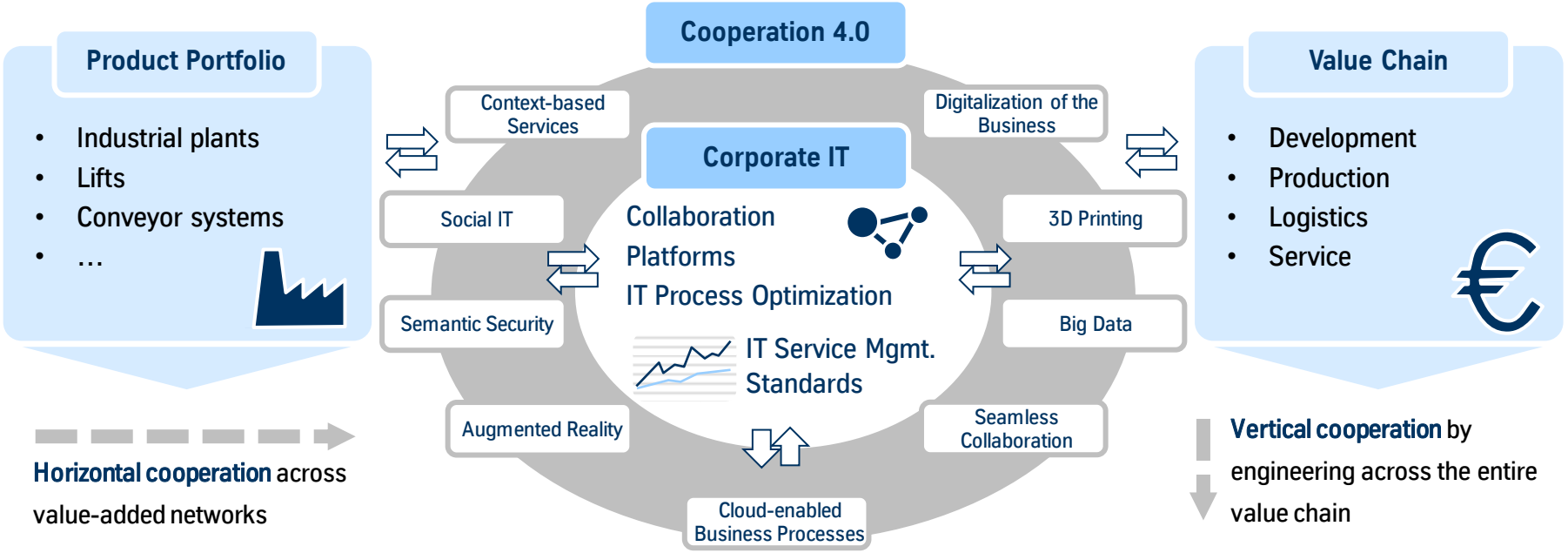



Group-wide Business Objectives

Strategic Directions

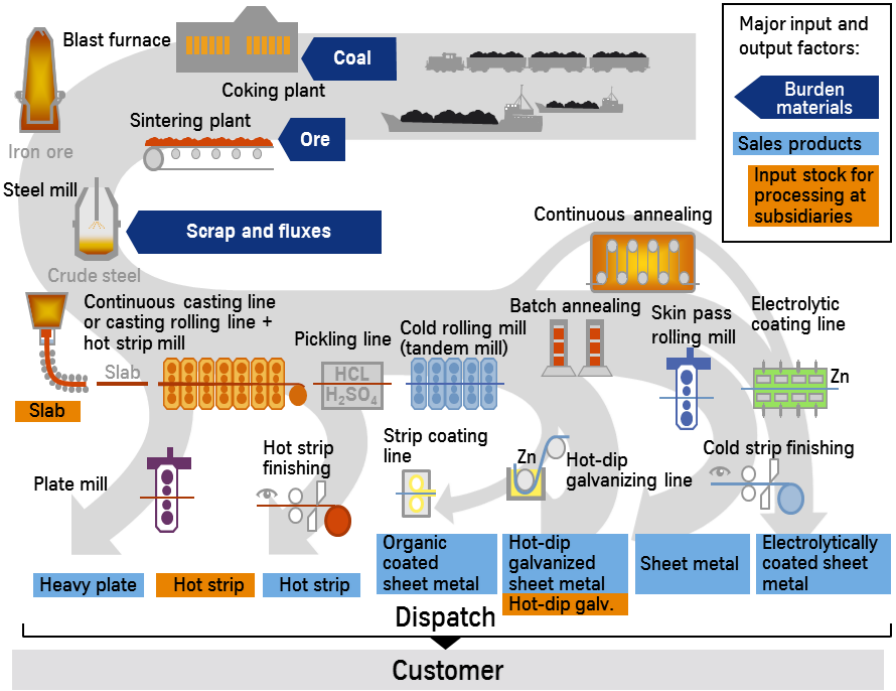
Top IT Trends

# Cooperation 4.0 defines the interaction between business and IT




Cooperation 4.0 is characterized by increased cooperation and a high degree of standardization

# Example Steel Europe: Inter-site production at BA SE calls for autarkic production network segments to avoid production losses




**Business requirements to be met by IT:**
**Complex network of processing units**

- Support of continuous production and discrete production processes, integrating them in business control systems
- Uninterruptible supply of the delimited production stages specific and highly available IT services
- Improvement of planning and control processes and systems in order to improve adherence to delivery dates

# Example Steel Europe: Planning process must also take into account broad product portfolio and complex plant structures



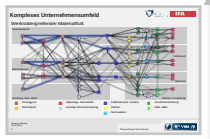
## Portfolio

- **Broad product portfolio** including **~ 28,000 articles** of **~ 950 steel grades**
- Almost exclusively customer-specific production ab initio and of products with **by-product/by-program requirements**
- **Complex system of rules** comprising ~ 15,000-20,000 rules for determining the technical production parameters for an order (up to 2,800/order)



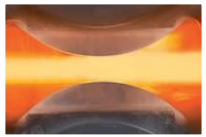
## Orders

- **> 300,000 customer order items** per year involving an **order volume of ~ 12 million tons**
- High flexibility conc. **order modifications at short notice** by customer
- Requirement of **short delivery times**
- **Dynamic allocation** of material to customer orders (subsequent reallocation of material)
- Fluctuating **backlogs of orders**



## Network

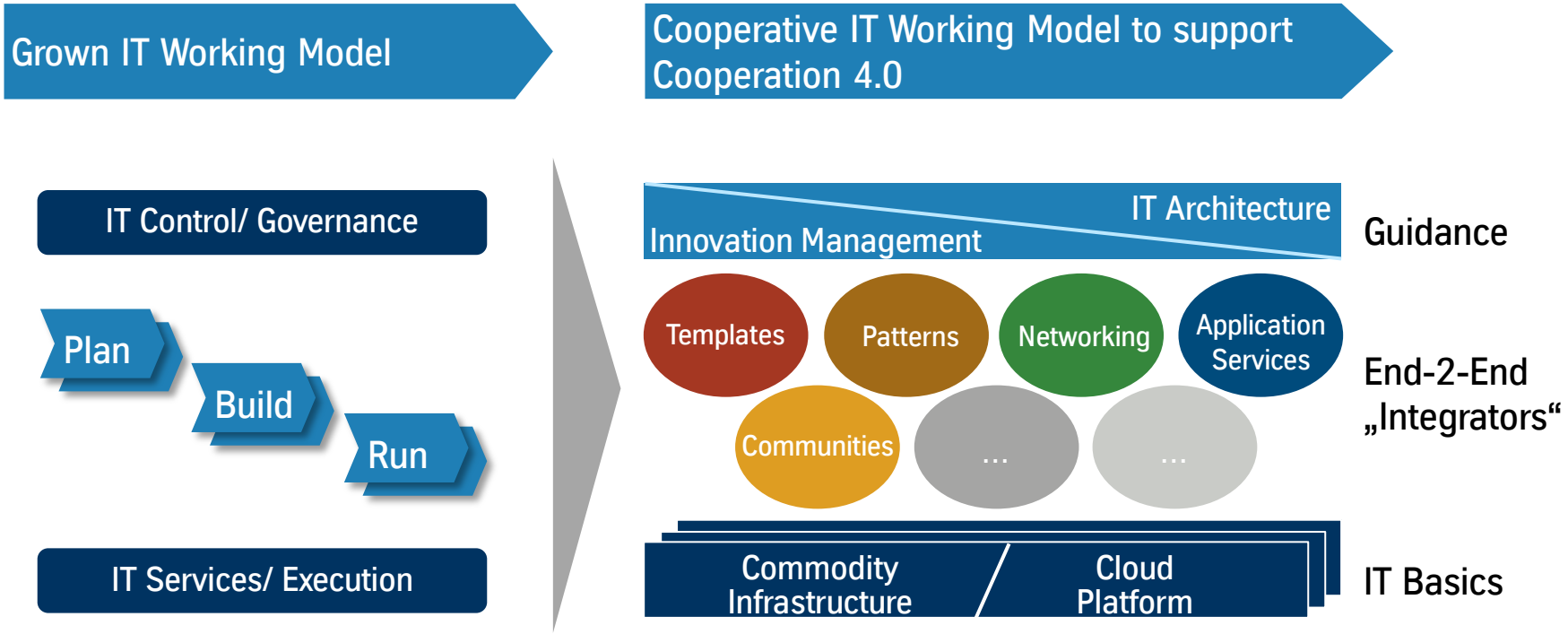
- **Complex network** consisting of **13** structurally different **sites**
- high logistic effort of on average **~ 3 site changes per order**



## Techn. require-ments

- Many technical **restrictions** have a non-deterministic impact on the **sequencing** at the units
- **Finalization problems** in continuous casting

# Development of Corporate IT 4.0



# Innovative IT: Technology enabling Industry 4.0

A guarantee in this life: Change! Flexibility is better than predictability!

Evinda Lepins

It's very hard for me to get a new car.
It's really hard for me to get a new house.
It's really hard for me to move on from the things that give me stability.

Jodie Foster

**Stability** and **flexibility** in IT seem to be contradictory at first, but for an innovative, business enabling IT - you need the best of both worlds working together.

ThyssenKrupp is innovating with SAP in many areas including Cloud, Big Data and Analytics in order to gain a competitive advantage.

A vital IT is key for Industry 4.0, Cooperation 4.0 and Digital Business.




# Any questions?