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Enterprise Resource Planning (ERP) systems in railway organizations

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Introduction to ERP Systems

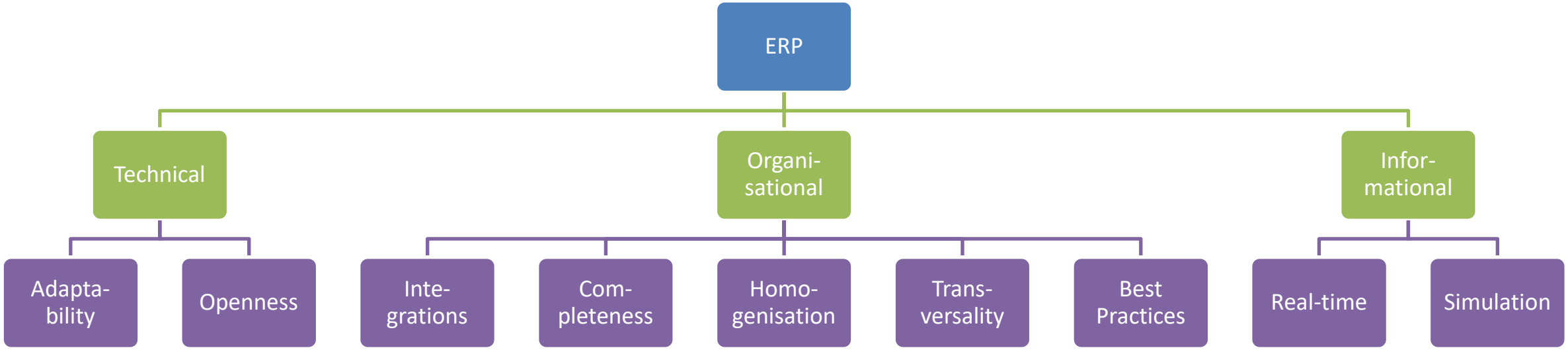
ERP Definition

- **Integrated Management**: Process of managing all resources and their use across the entire enterprise in a coordinated manner.

- **Comprehensive System**: Set of integrated applications ideally supporting all functional areas.

- **Unified Platform**: Promises one database, one application, and one user interface for the entire enterprise.

ERP Characteristics



ERP Basic Functionality

ERP Benefits

- Improved Efficiency
- Enhanced Decision Making
- Increased Productivity
- Cost Reduction
- Standardized Processes
- Integrated Information
- Scalability
- Regulatory Compliance

ERP Promise

ERP Limitations

1. **Not One-size-fits-all**
    - General solutions may not cover all specialized needs
2. **Industry Specific Requirements**
    - Specialized industries like railways have unique demands
3. **Customization Needs**
    - Often requires significant customization to fully meet specific industry requirements
4. **Complex Integration**
    - Challenges in integrating with legacy systems and specialized software

ERP Systems in the Railway Industry

About ERP


From Procure to Pay
From warehouse to finance, from maintenance to sales
Tying together parts of a business
ERP
Covering full processes of a railway company
From Order to Cash

Key Starting Point

Functionalities

- Finance
- Accounting
- Inventory
- Supply Chain
  - Procurement
  - Transport
  - Logistics
- CRM
- HRM

Implementation risks

- What change is needed?
- Change readiness
- Timeline
- Resistance
- Data quality (excel, existing systems)

Considerations

“ERP” provides information availability for everyone at anytime ?

No! → Focus on specific functions first (example HR or CRM)

Fundamental question:

Fully integrated system vs. Dedicated modules

- Parallel development of different separated solutions with dedicated outcome (example HR module, finance module, asset mgmt. Module)
- Definition of added value of integrated solutions
- „Cloud“ for easier and faster implementation of specific modules, can be adjusted individually much faster compared to integrated full scale solutions
- „Best of bread“ solutions more successful then „inflexible“ ERP
- One „platform“ vs. Multiple systems even from different suppliers

Considerations - How to chose an ERP system?

Functionality	Integration	Flexibility	Scalability	Maturity	Maintainability	Cultural impact

- Financials (AR/AP, reports, KPI etc.)
- Data analysis (such as Track Quality Index TQI)
- SCM, CRM, HRM (incl. training programs etc.)
- … many more

Considerations - How to chose an ERP system?

Functionality	**Integration**	Flexibility	Scalability	Maturity	Maintainability	Cultural impact

- Implementation complexity (enterprise architecture)
- Data availability and timeline (where is the data today?)
- Partner options
- Resistance expectations
- Choice between web-based solutions for accessibility and dedicated software for robust performance
- Connection with existing IT infrastructure and synchronization across platforms

Considerations - How to chose an ERP system?

Functionality	Integration	**Flexibility**	Scalability	Maturity	Maintainability	Cultural impact

- How fast can new systems adjust to new situations?
- Sales and marketing need fast insight into operations (availability of wagons and locos for example)
- Historic data quality and accuracy

Considerations - How to chose an ERP system?

Functionality	Integration	Flexibility	Scalability	Maturity	Maintainability	Cultural impact

- Processes with high numbers
  - Infrastructure inspections provides millions of failures and deviations
  - Rolling stock maintenance requires thousands of spare parts and material
- How flexible can solutions be adjusted to railway systems?
- Configure to accommodate growth
- Adapt to evolving industry demands

Considerations - How to chose an ERP system?

Functionality	Integration	Flexibility	Scalability	Maturity	Maintainability	Cultural impact

- How robust is the new system compared to the legacy system?
- How flexible is it?
- How deep does it cover the requirements?
- Fix system vs. cloud system?

Considerations - How to chose an ERP system?

Functionality	Integration	Flexibility	Scalability	Maturity	Maintainability	Cultural impact

- Ease of maintenance (internal or external)
- Technology skills in IT department
- Business user competencies

Considerations - How to chose an ERP system?

Functionality	Integration	Flexibility	Scalability	Maturity	Maintainability	Cultural impact

- Data implementation in different environments
- Analysis of data
- Use of analysis results in decision making process
- Order chain and data usage
- Transparent responsibilities
- Initial training essential for maximizing system utilization

Considerations

Data migration and integration

Mapping of data

Prioritization of data

Cleaning up data

Targets

Business Process Improvement

Automating manual processes

HR training program	Detection of failures in infrastructure	Recording of man-hours for maintenance of assets
Procurement of material	Monitoring energy consumption of locos	… and many more

Targets

Business Process Improvement

Centralized visibility of information

Marketing needs operations cost information	Regional Departments need track quality information	Mechanized maintenance department needs track quality information
Passenger department needs track capacity availability information	Freight department needs locomotive and wagon availability information	… and many more

Targets

Business Process Improvement

Financial consolidation

Top Management requires reports on overall financial results regularly	Department management requires business unit related reports	Head of maintenance workshop requires reports workshop related costs and revenues
Freight department requires information on operations costs for trains, terminals and yards	Infrastructure department requires KPI such as costs per track km and maintenance activity	… and many more

Targets

Business Process Improvement

Shared services

Quality control of activities

- Documents on quality check
- Transparent responsibility
- Measurements of quality over time

Asset utilization

- Km per locomotive p.a.
- Km or t per maintenance machine per day
- Tons or trains per track/km
- Hours per shunting locomotive
- Etc.

Targets

Business Process Improvement

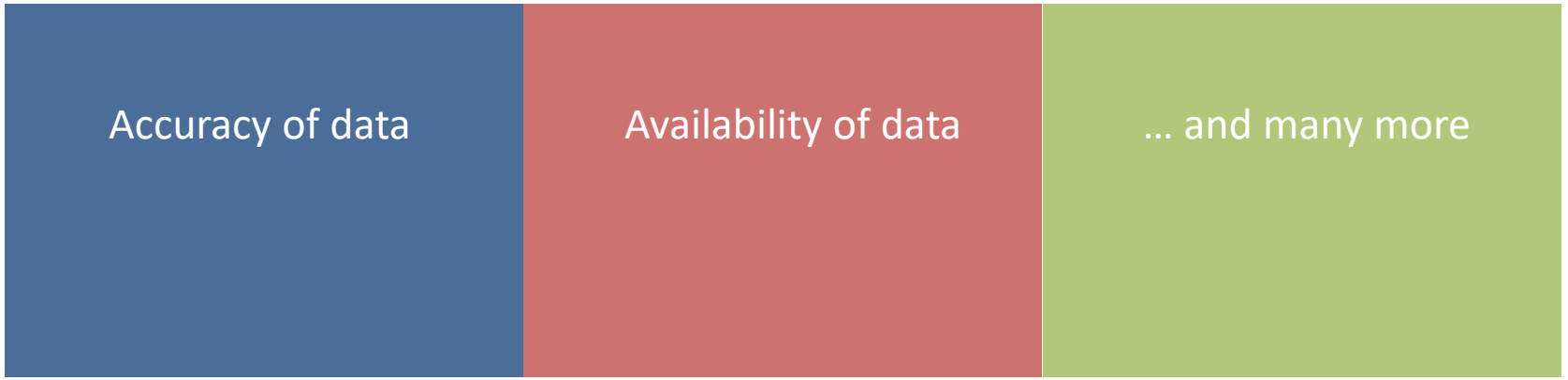
Better Planning

Data meaning	Future developments	Planning resources	Planning activities
• KPI development • Quality indices	• Tech Integration • Regulatory Compliance	• Asset Allocation • Budget Forecasting	• Task Scheduling • Risk Management

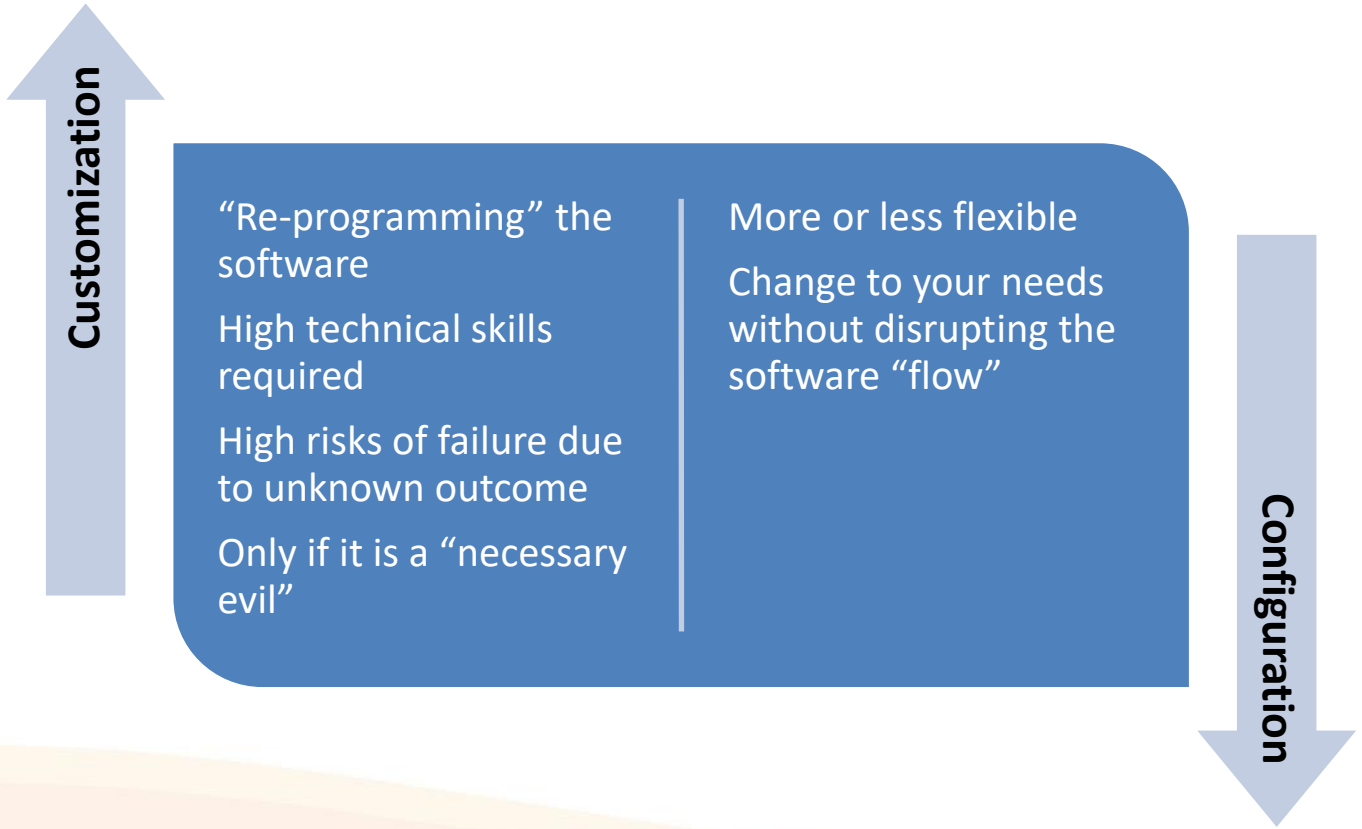
Targets

Business Process Improvement

Improved Data Management



Implementation Risks



Case Study: Rolling Stock Maintenance

Company: CTL Logistics
Software Solution: RAILSoft by Petrosoft
Main Focus: Asset Management & Maintenance

Objectives

- Streamline Maintenance Processes
- Improve Predictive Maintenance
- Enhance Operational Efficiency

Implementation

- Connection with existing systems
- Data input for all interfaces
- Ensure accordance with local regulations

Outcomes

- Reduction of operational costs
- Enhancement of equipment reliability
- Regulatory compliance

Key Railway-Specific Components

Asset Management & Maintenance

Operations & Scheduling

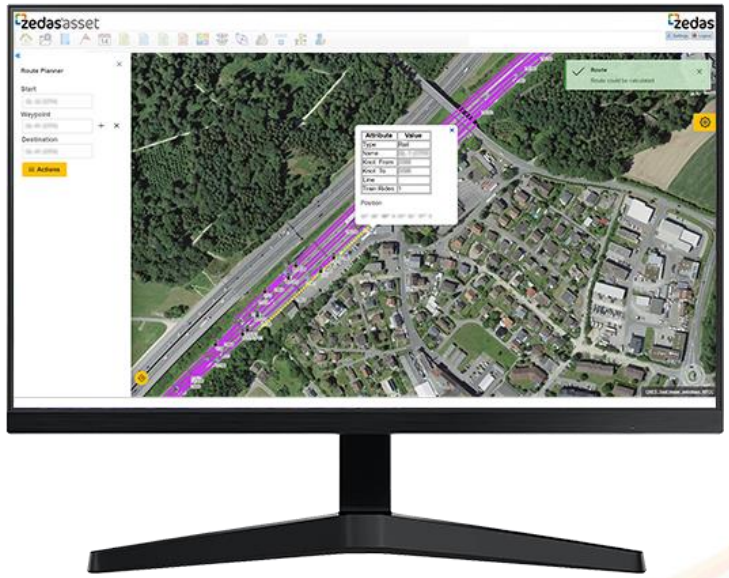
CRM & Pricing

Safety & Compliance

Case Study: Infrastructure Maintenance

Software Solution: zedas®asset by ZEDAS GmbH
Main Focus: Asset Management & Maintenance
Key Features:

Graphical Visualization	Virtual track network mapping
	Positionally accurate object data
	Condition and maintenance history visualization
Data Integration	On-site inspection integration
	Video run data analysis
	Archiving of evaluated data
Predictive Maintenance	Condition forecasts of assets
	Planning of maintenance activities
	Investment decision support
Mobile Maintenance Management	Fault recording and work order reporting
	Offline functionality
	App support for mobile service teams
Resource Management and Planning	Planning of personnel and materials
	Bottleneck detection
	Early detection of planning conflicts



Case Study: Managing Shunting Traffic

Software Solution: ZEDAS Logistics Solution by ZEDAS GmbH
Main Focus: Operations & Scheduling

Features

- Real-time shunting schedule management
- Automated task assignment
- Track occupancy monitoring
- Equipment utilization tracking
- Incident management integration

Benefits

- Enhanced shunting efficiency
- Reduced idle time and delays
- Improved track capacity utilization
- Optimal equipment allocation
- Streamlined incident resolution

Case Study: Enhancing Operational Efficiency

Company: Railpool Lokservice & Co. KG
Software Solution: Boom Rail Asset by Boom Software
Main Focus: Operations & Scheduling

Features

- Centralized fleet control
- Real-time availability tracking
- Integrated scheduling
- Staff management
- Integration with maintenance processes
- Predictive maintenance capabilities

Benefits

- Streamlined processes
- Reduced downtime
- Lower vehicle and personnel expenses
- Optimized resource utilization
- Improved maintenance outcomes
- Extended asset lifespans

Managing and Optimizing ERP Systems

Regular Updates

- Keep software up-to-date with the latest features and security patches

Performance Monitoring

- Use analytics to track system performance and usage

Feedback Loop

- Establish a feedback system for users to suggest improvements

Q&A