

**Mindset & Culture**

• New paradigm of work  
• New way of thinking  
• New way of working  
• New way of life

**Intelligent Railway**

• Intelligent railway system  
• Intelligent freight transport  
• Intelligent infrastructure  
• Intelligent new technology

**New Life cycle Concept**

• Shorter development period  
• Shorter production period  
• Shorter life cycle  
• Shorter disposal period

**Wagon Production**

• Higher volume  
• Automated fabrication  
• Industry 4.0  
• Total Effects - Mass Production  
• Asset driven production

**Logistic Approach**

• Intelligent transportation  
• Digital systems  
• Smart data supply chain  
• Asset driven



**Costs**

• Business case  
• Risk management  
• Value chain management  
• Life cycle cost

**New Mechanic**

• New materials  
• New manufacturing processes  
• New design  
• New production

**Electrification**

• New traction  
• Change to battery  
• Change to electric

**Digital Applications**

• Smart Light Systems  
• Smart Signaling  
• Smart Infrastructure  
• Smart New Technology

**Intelligent Brake**

• Intelligent braking system  
• Intelligent freight transport  
• Intelligent infrastructure  
• Intelligent new technology

**Automation**

• Intelligent braking system  
• Intelligent freight transport  
• Intelligent infrastructure  
• Intelligent new technology

**Megatrends in rail freight traffic in Switzerland.**

- Deindustrialisation**
  - Change in freight structure
  - Smaller consignment units, shorter distances
- Demographic change**
  - Age structure of the current workforce
  - The future generations of workers demand different job profiles
- Digitalisation**
  - Major opportunities to increase efficiency
  - Risk of disruption due to other carriers

**SBB Cargo Automation**

**SBB Cargo Digitalisation**

**SBB Cargo Fleet**

**SBB Cargo Digitalisation**

**We drive the development of rail freight traffic.**

**Building Customer Solutions**

**Best of Technology and Experience**

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 SBB CFF FFS Cargo

# Digital Transformation on Rail Freight

SBB Cargo AG  
Stefan Christian Hofstetter  
Brussels, 13th April 2018



# Megatrends in rail freight traffic in Switzerland.



## Deindustrialisation

- Change in freight structure
- Smaller consignment units, shorter distances



## Demographic change

- Age structure of the current workforce
- The future generations of workers demand different job profiles



## Digitalisation

- Major opportunities to increase efficiency
- Risk of disruption due to other carriers



## SBB Cargo Automation

mehr Effizienz im Rangierbetrieb



Automatische Kupplung



Automatische Bremsprobe



Kollisionswarnsystem

Ein-Personen-Betrieb

## SBB Cargo 5L

nachhaltige Komponenten für den Güterwagen der Zukunft



Leise



Leicht



Laufstark



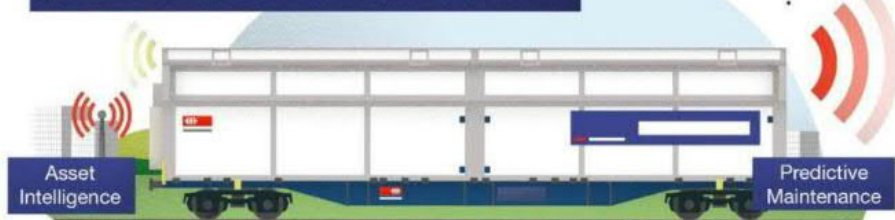
Logistikfähig



Lifecycle-costorientiert

## SBB Cargo Smart

Komponenten für den intelligenten Güterverkehr



Sensoren-Box



Verwiege-wagen

Flexibler Oberbau



RFID



Wayside Kamera

## SBB Cargo Digital

digitale Sendungsinformationen für Kunden



Mobile Wagenkontrolle



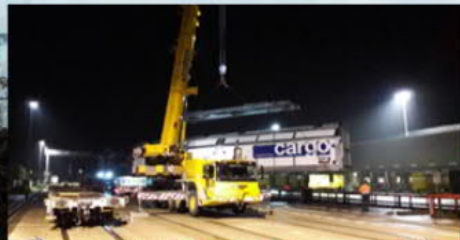
Cargo API



Cargo View

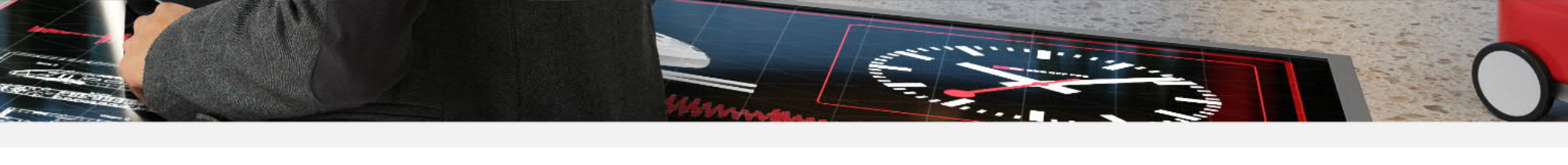
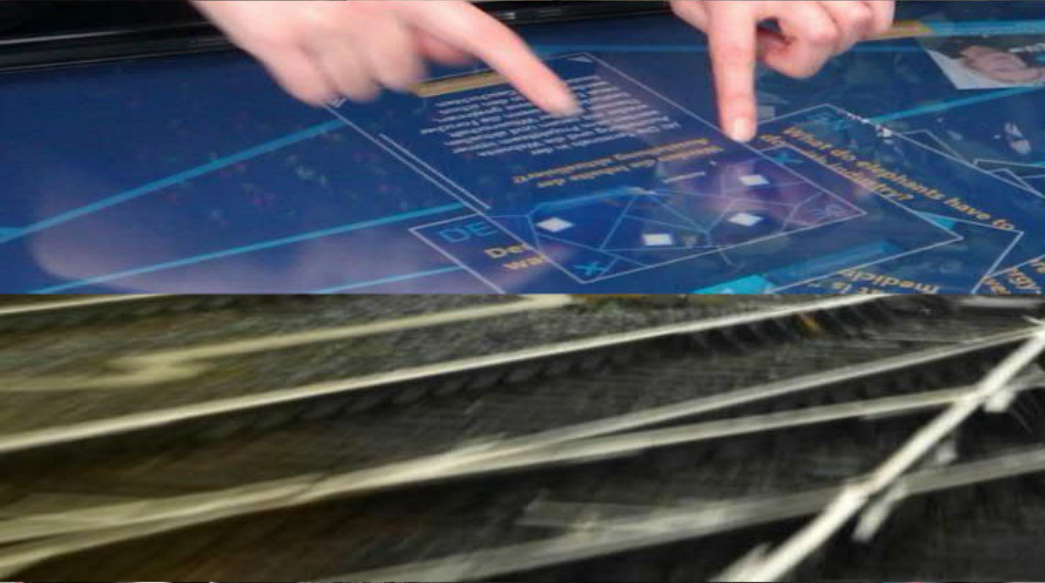


Cargo Check-in





What's next?



# Mindset & Culture

- new point of view
- Physic first - change Regulations
- think different



# New Life cycle Concept

- Minimal Maintenance philosophies
- limited Life cycle
- Disposable Components





# Wagon Production

- Higher Volume
- Automated Fabrication -  
Industrie 4.0
- Scale Effects - Mass Production
- Fast Innovation Cycles



# Logistic Approach

- Modular Superstructure
- Digital Services
- Integration Supply Chain
- Added Services



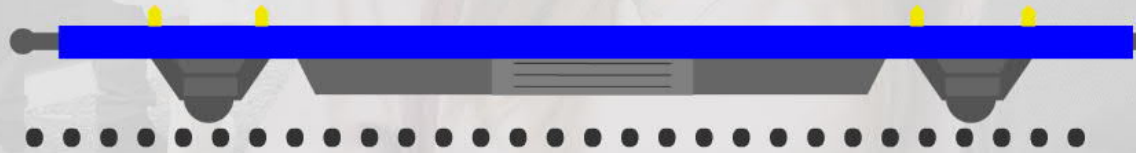
# Costs

- Business case
  - Fleet Keeper
  - Railway Undertakings
  - Infrastructure Manager
- Target Cost for Invest
- Life Cycle Cost Target



# New Mechanic

- Light weight
- wear reduction
- automated Coupler
- Energy Savings
- Noise reduction



# Electrification

- Basic Feature
- Energy for Intelligence
- Energy for Logistic Functions



# Automation

- Vision no Person Shunting
- New Mainline Operation
- Automated Train Monitoring



# Intelligent Brake

- condition Monitoring
- automated Brake calculation
- Fast acceleration and deceleration Signal
- Better Braking effort

## Deceleration

- Holding Brake
- slide protection
- Emergency Brake

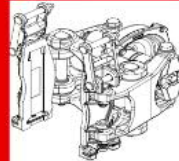
## Self driving Wagons

- Last Mile Driving Unit
- Loco Support
- Energy recuperation

Digital Train Control  
Acceleration and Deceleration  
Train Integrity Control for ETCS L3

Automated Train Brake  
calculation

Single Disk Brake  
Per Axle



Total Cost of Ownership  
optimized

Operation Control / Function Monitoring

20 Years Maintenance „Free,“

## Measuring

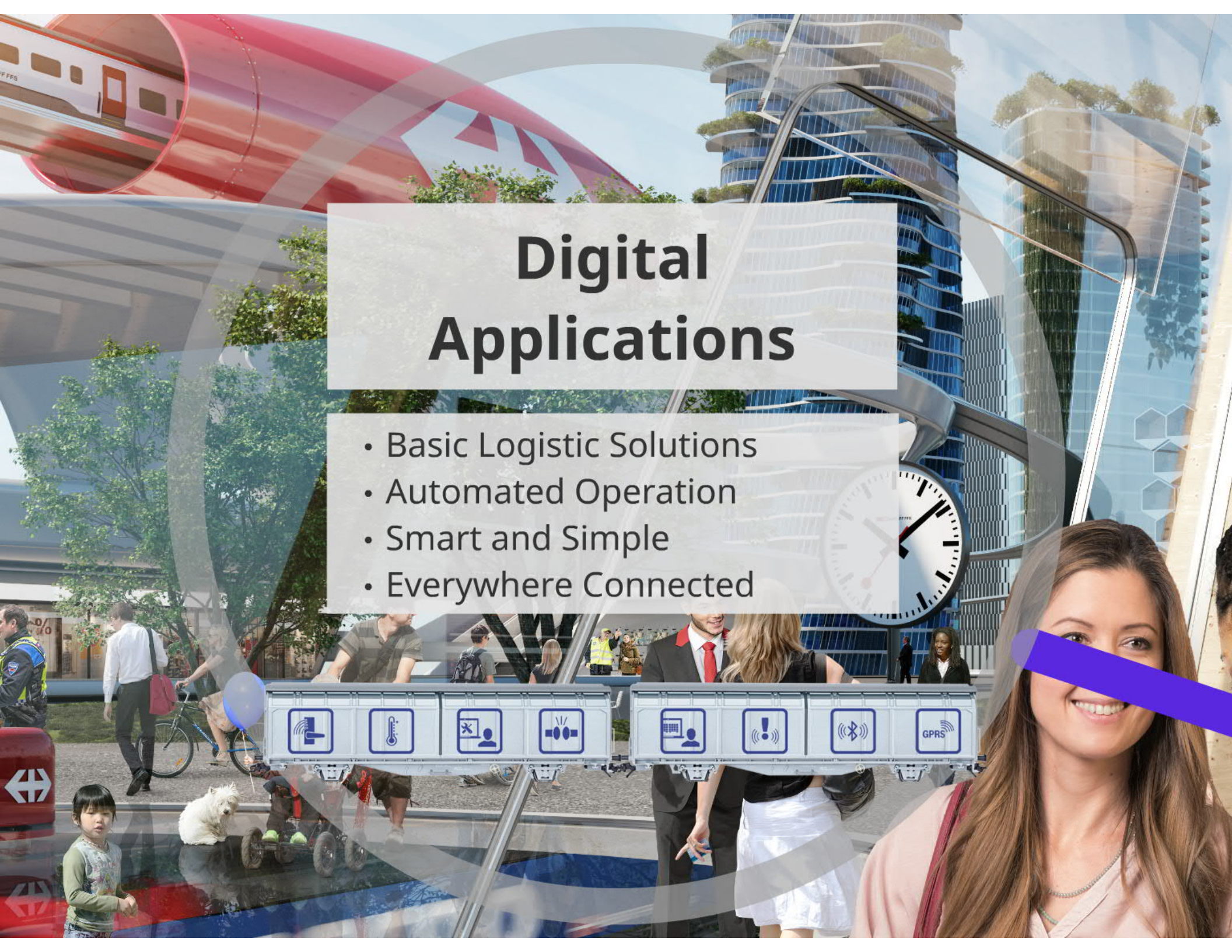
Brake Functionality  
+  
Axle Load

Sensors

- abrasion, heat  
and  
force control

# Digital Applications

- Basic Logistic Solutions
- Automated Operation
- Smart and Simple
- Everywhere Connected





# Intelligent Railway

- Integrated railway system
- Intelligent Freight Train with new Locomotives
- Infrastructure Data Exchange



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- Think different

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1 cargo

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- Modular Superstructure
- Digital Services
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**CC-OPTIMIZED**

30 % of investment

- Optimized for Maintenance
- Target Cost
- Life Time 30 Years
- (Clickable like second Wheelset)

**IGHT**

- 161 Tons
- Chassis new designed
- Lightweight design

**RUNNING OPTIMIZED**

- 4 Mio. km in 20 Years
- New standard axle for 161 tons
- Durable components
- Automated coupling
- New braking system

**LOW NOISE**

- below 70 dB
- Rail Head
- Aerodynamics
- Flexibly adjustable bogie

**LOGISTIC**

- Integration Supply Chain
- Automated Railway Production
- Electricity
- Standard Interface

In Service from 2021 (1st test run)

### Intelligent Brake

- condition Monitoring
- automated Brake calculation
- Fast acceleration and deceleration Signal
- Better Braking effort



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### New Mechanic

- Light weight
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- Energy Savings
- Noise reduction

### Electrification

- Basic Feature
- Energy for Intelligence
- Energy for Logistic Functions





**Leise**  
**Leicht**  
**Laufstark**  
**Logistikfähig**  
**Life Cycle Costs-Orientiert**

**SBB CFF FFS Cargo**

## LIGHT



**10 t Tare**

- Chassis new designed
- Lightweight Bogie

## RUNNING OPTIMIZED



**4 Mio. km in 20 Years**

- New standard axel for 2mio km
- Disposable componente
- Automated coupling
- New breaking system

## LCC-OPTIMIZED



**20 % of Investment**

- Optimized for Maintenance
- Target Cost
- Life Time 20 Years
- (Exclude the second Wheelset)

## LOW NOISE



**below 73 dB**

- Disc Break
- Aerodynamics
- Radially adjustable bogie

**In Service from**  
**2021**  
 (1000 Cars)

## LOGISTIC



**Integration Supply Chain**

- Automated Railway Production
- Electricity
- Standard interfaces



We drive the development of rail freight traffic.



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