

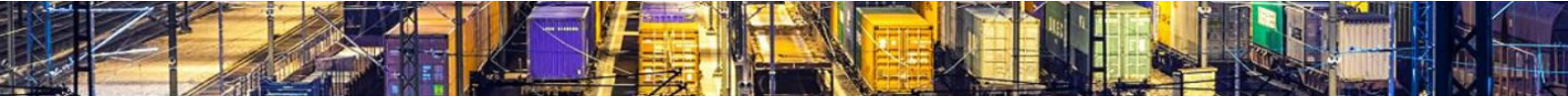


ТЕМПЕРИЛОДЖИСТИКСЕОД
TEMPERI LOGISTICS LTD



Railway exchange

2024

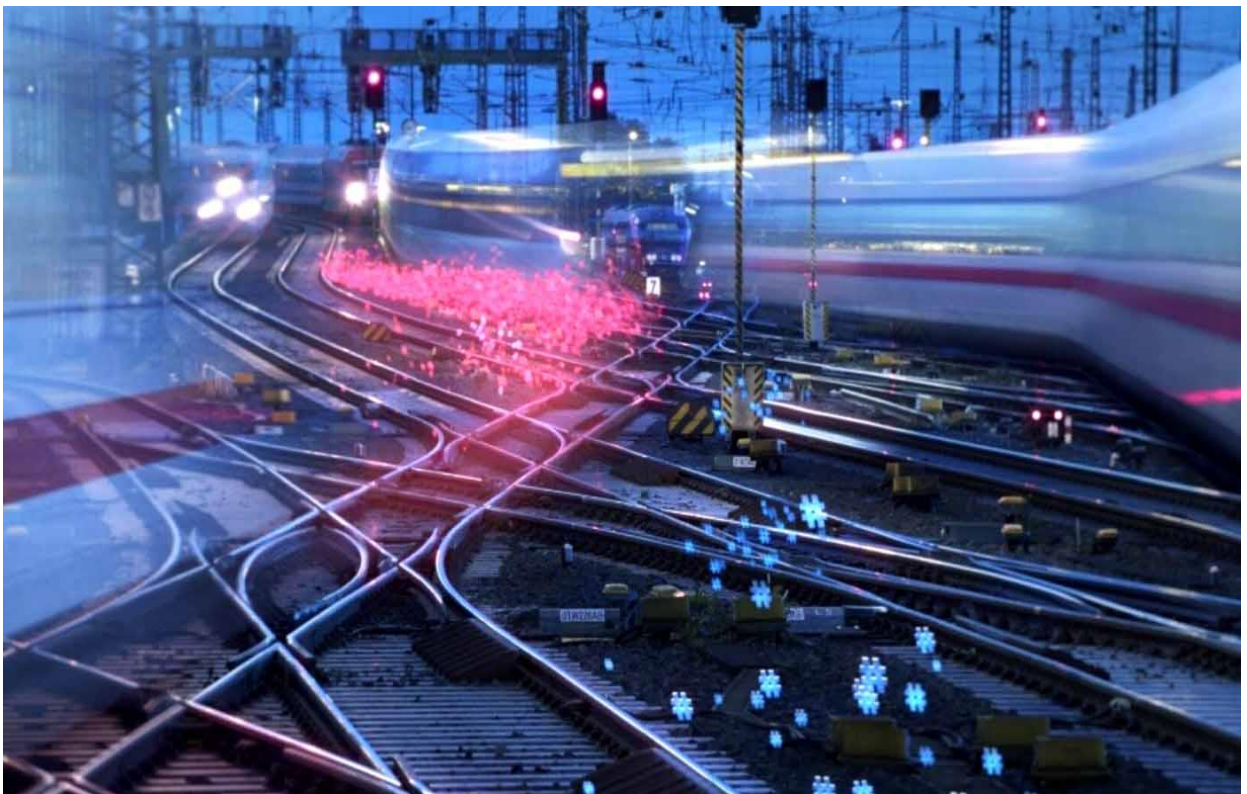


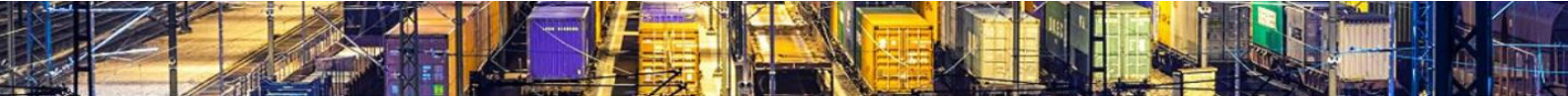
Digitalization of railways

International rail transport is an alternative that is faster than sea and cheaper than air. The idea of sharing free railway capacity based on artificial intelligence is also relevant, as in the above-mentioned areas of logistics: air, sea and road transport. The future of the rail market - in a new digital form that meets today's business needs.

The digital rail market is not as large as, say, road or maritime transport, which we have covered in our previous publications, but we will try to highlight the main points of the work and present it to interested parties - shippers, freight forwarders, train operators, wagon owners, consulting companies, available IT services.

Digitalization is fundamental to make rail transport economically viable and environmentally friendly, which allows for innovation and new markets.





Despite the vast branching of the railway network, most of them are technically insufficient to work in the conditions of technological change, which although slow remains, but for it future of the industry and significant advantages.

The European Rail Traffic Management System (ERTMS) was adopted back in 2000, but today effective digitalization requires a massive transformation rather than a partial and fragmented approach.

Since 2006, the European Railway Agency (ERA) has been working to create a competitive European rail network by increasing cross-border traffic and providing the required level of safety, Setting standards for European railways in the regulation «Technical specifications of cooperation».

Automated systems for centralization, dispatching and incident management offer significant advantages in terms of capacity as well as in terms of efficiency, safety and sustainability of all participants in the rail market.

Research in this area has shown that digital technologies will bring the following significant benefits to shippers, operators, freight forwarders, regulators and equipment manufacturers:

- Increase capacity without building additional tracks.
- Improved operational and maintenance efficiency.
- Cost savings through digital train control and traffic management.
- Increase accessibility reliability and punctuality of the railway system.
- Strengthening of technological leadership.
- The contribution of the rail sector to achieving the overall CO2 emissions targets for transport by 2030 and beyond.
- New opportunities for other players to innovate and change the industry's overall strategy towards digitalization and automation.





*According to a study by the German consulting company SCI Verkehr, the global market for railway equipment, technologies and services **in 2023** has passed the **€200 billion** mark for the first time and is projected to grow **4.6%** annually over **the next 5 years**.*

This is a rather optimistic forecast that shows serious changes related to the digitalization of technological processes and transport logistics chains in general. Growth in this digital sector will continue at an average annual rate over the next 5 years, outpacing growth in established rail infrastructure and rolling stock markets.

***China** has been the growth driver of the rail industry in recent decades and remains the world leader with a domestic market size of around **€40 billion**.*

***The Asian market**, which is valued at **€69.3 billion** overall, has seen particularly strong growth in India. In this country, the development of railways received strong political support.*

*In **the Africa and Middle East** region, the world's fastest-growing region, we are set to achieve an annual market growth rate of up to **8%** in the next five years. The market is now relatively small - **€7.7 billion**. In the Middle East, a number of projects are being implemented to build rail systems, and at the highest standards. This obliges suppliers to respond to demand with innovative technology.*

***The European market**, currently valued at **€67.2 billion**, is expected to grow at an annual rate of **5% by 2028,4%** due to large investments in upgrading and developing existing railways and a significant need for capacity expansion both of urban rail systems and high-speed lines.*



Rapid response to changing trends provides tremendous advantages in the competitive logistics industry, as logistics processes are one of the most important components in generating value in business models of any company regardless of industry.

Thus, the demand for advanced digital technologies in transport and logistics, which in 2020 was 1.24 billion dollars.

This is a significant increase in the number of new companies that are now using the same technology, will rise to 6.27bn USD in 2030. In this structure the share of AI and neurotechnology's will be 35%, while the annual increase will be 40%. The Russian Federation has a very strong interest in the development of new technologies. Also, across all industries, transport and logistics companies can become a key consumer of AI-based solutions in the run up to 2030.

In 2023, 28.8% of transport companies used AI-based technologies, 29.7% of industry companies planned to implement AI within 3 years, and 21.5% of users and developers defined a strategy or roadmap for AI development.

According to 2023 results 20.8% of companies that have implemented AI, assess the economic impact of implementing AI as significant or multiple, and 86% of organizations have financing for AI development action plan.





The railway industry members, who are part of professional international coalitions, carefully monitor the constantly changing trends and challenges of today's world by developing solutions and products to increase transport capacity, Enhancing synergies in the exchange of innovations, technologies and information, digitalization of wagon fleets and other development directions.

Thus, the UIC, a professional and technical association representing the unity of the rail sector on a global scale and working to promote the exchange of information, experience and best practices, is represented by 206 active participants.



Web: <https://uic.org/>

Rail Freight Forward is a coalition of European rail freight companies that seek to radically reduce the negative impact of freight transport on the planet and mobility through innovation and a more intelligent transportation mix. UIC Freight acts as the overall coordinator of the RFF program and related technical projects.



Web: <https://www.railfreightforward.eu/>

The RFF coalition is united and driven by a common vision to make rail freight transport a green and multimodal logistics base for all people in Europe. RFF aims for 30% of the modal share of rail freight by 2030. The vision of «30 by 2030» is being implemented through the harmonization of existing processes and the introduction of technological changes, which include:

- Digital platform (DP-RAIL) - a single consolidated data system for all countries and companies that ensures seamless international transport and creates new, more competitive rail freight products for customers.
- Digital Capacity Management (DCM) - internationally standardized capacity planning that provides instant and fully digital cargo booking, flexible to the market.
- Digital Automatic Coupling (DAC) - automating train assembly by replacing manual clutch with a more reliable, standardized digital solution to create faster, longer and heavier freight trains.



- The European Rail Traffic Management System (ERTMS) - ensures uniform digital infrastructure and train systems across Europe, thus contributing to a unified railway network without borders.
- Autonomous train management (ATO) - controlled or fully automated control and speed of trains on main lines, terminals and shipyards, which simplifies work and allows more trains to pass through and, therefore, to transport more cargo.

It is clear that in addition to the competence and passion of specialized companies, associations and coalitions, this area of activity needs reliable service partners who form a comprehensive, seamless network - for tomorrow's logistics solutions and uncompromising quality of service.



To address the challenges facing the international rail sector, RailNetEurope (RNE) was established in 2004.

RailNetEurope (RNE) is the European association of rail infrastructure managers, 49 members. It acts as an umbrella organization that helps coordinate the international processes of its members in the areas of bandwidth management, traffic management, corridor management, IT, sales and legal issues.





Function

- RNE and its members are coordinating processes and developing central digital capacity management applications to support European capacity management processes.

Infrastructure managers (IMs) provide timetables for train planning by train operators. The procedure for requesting, proposing and planning a railway capacity is known as the «train allocation process».

RNE's approach to digital capacity management (DCM) is to make national IT capable of participating in international capacity management processes, provide centralized IT for processing and merging national IT at all stages of the process and connect all IT through interfaces.

- RNE's traffic management activities are aimed at improving the operational processes and cooperation of members, increasing the overall efficiency of international and national rail transport with a focus on customer needs.

RNE actively supports its members in creating train forecasting solutions for more effective train management and better resource management across the supply chain.

RNE currently leads several conceptual activities related to road traffic management such as the Language Programme, the Arrival Time Payment Programme (ETA) and the Virtual European Traffic Management Network (ETMN) concept.





- RNE harmonizes the main processes of international rail business used by infrastructure managers (IMs) and distribution authorities (ABs), providing a coordination platform for RFC organizations to jointly develop harmonized processes and tools for the benefit of applicants.
- Facilitating the use, development and implementation of software tools in accordance with changing business requirements is an important part of RNE's IT strategy. The IT RNE task is to ensure that the required functions are available and in accordance with agreed service levels (SLA).

Work is carried out in 3 directions:

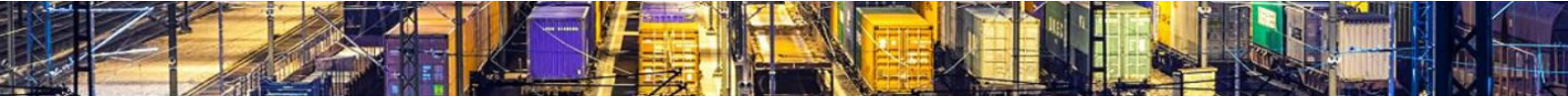
1. Information on digital infrastructure
2. Digital Capability Management
3. Train Digital

To ensure and simplify the European rail connection, RNE uses several applications serving its members and the entire railway sector. These applications are consistent with and leaders in the implementation of TSI (such as TAF and TAP) and European regulations. RNE applications are one of the largest and most widely used business applications in the sector.

Let's look at these platforms in more detail:

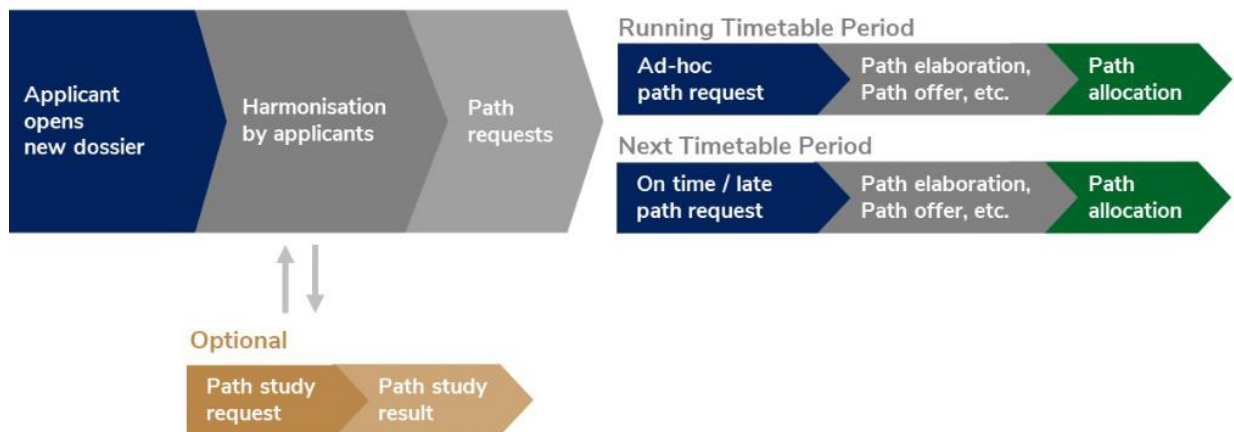
The Route Coordination System (PCS) is an international route coordination system for applicants of routes (railway undertakings (RU) and non-RU), infrastructure managers (IM), distribution authorities (AB) and rail freight corridors (RFCs). The web-based application optimizes international path coordination, ensuring that path requests and suggestions are harmonized by all involved parties. The input for international path queries is only required once in a system - either in the internal application or directly in the PCS.





PCS platform provides a single workflow that allows RU and AB to use the standard dossier for all types of path requests.

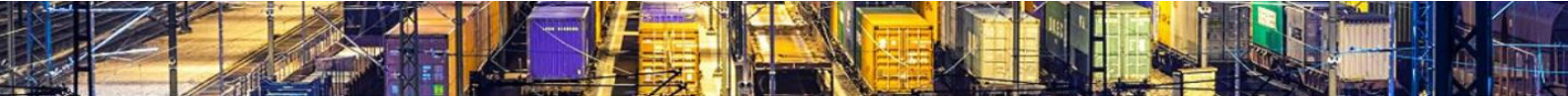
Depending on the date of request and requested schedule period, PCS will automatically determine whether the request is a special path request for the current schedule, the path request placed in time for the next annual schedule, or a query that should be considered as a late path request for the next calendar year. Users can select (available) process type at start.



Use of the RNE Route Coordination (PCS) system is free for all RNE infrastructure managers and customers licensed to any of their networks. Any other cases are covered by other tariffs.

Network and Corridor Information System (NCI) - the portal is intended to facilitate access to information published in network reports (NS) and corridor information documents (CID). The system keeps documents related to current and upcoming schedules, regularly updated IM/AB and RFC for providing latest published versions and allows for faster and easier pre-planning procedures.

Train Information System (TIS) is a web application that supports international train management by providing real-time train data for international (partly national) passenger and freight trains. The relevant data is obtained directly from the systems of infrastructure managers.



The system is already fully TAF/TAP TSI compliant and also leading in terms of implementation of this complex structure. The system supports mainly international railway enterprises and terminal operators in managing their logistics chains, and also supports rail freight corridors by providing reports for train performance management. TIS currently handles more than 7.2 million individual trains per year.

TIS offers train monitoring, reporting, data exchange and traffic management tools such as Incident Management (IMT).

Rail Facilities Portal (RFP) - a web portal that provides quick access to information on all types of facilities for cargo terminals, marshalling yards etc.

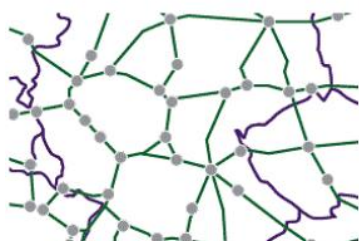
The Client Information Platform (CIP) is an interactive, web-based information tool. With the help of graphical user interface (GUI) CIP provides accurate information about routing, terminals, specific properties of the track and investment projects in infrastructure, as well as ICM lines and their options for changing the route of participating rail freight corridors (RFCs).

At the moment CIP displays information on railway infrastructure in 26 European countries, covering the entire network of all 11 RFCs:

Rhine-Alpine, North Sea-Mediterranean, Scandinavian-Mediterranean, Atlantic, Baltic-Adriatic, Mediterranean, Orient/East-Med, North Sea-Baltic, Rhine-Danube, Alpine-Western Balkan and Amber.



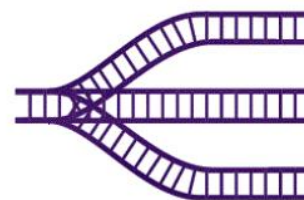
Information Charging System (CIS) - Web-based application with information on the charging associated with the use of European rail infrastructure, the cost of using international railway tracks, Stations and maneuvers for different national rail infrastructure charging systems, covering a network of more than 20 European infrastructure managers.



Train paths



Station use



Shunting

In addition to automatic instant messages, you can also contact the OSS (Unified Service Center).

Common Components System (CCS) - Platform for standardized data exchange: country and location codes, Rolling Stock Reference Database (RSRD).

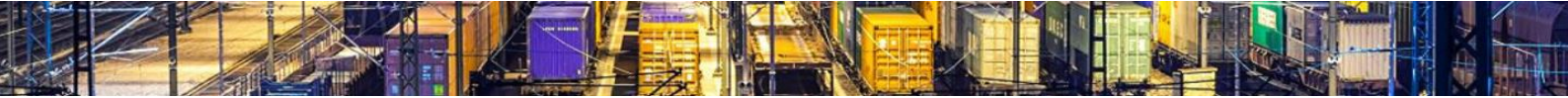
Consists of 3 elements: Common Interface (CI), Central Reference File Database (CRD), Certification Authority (CA), which provides secure communication between the parties using a common interface.

Temporary Bandwidth Limits (TCR) with interactive map.

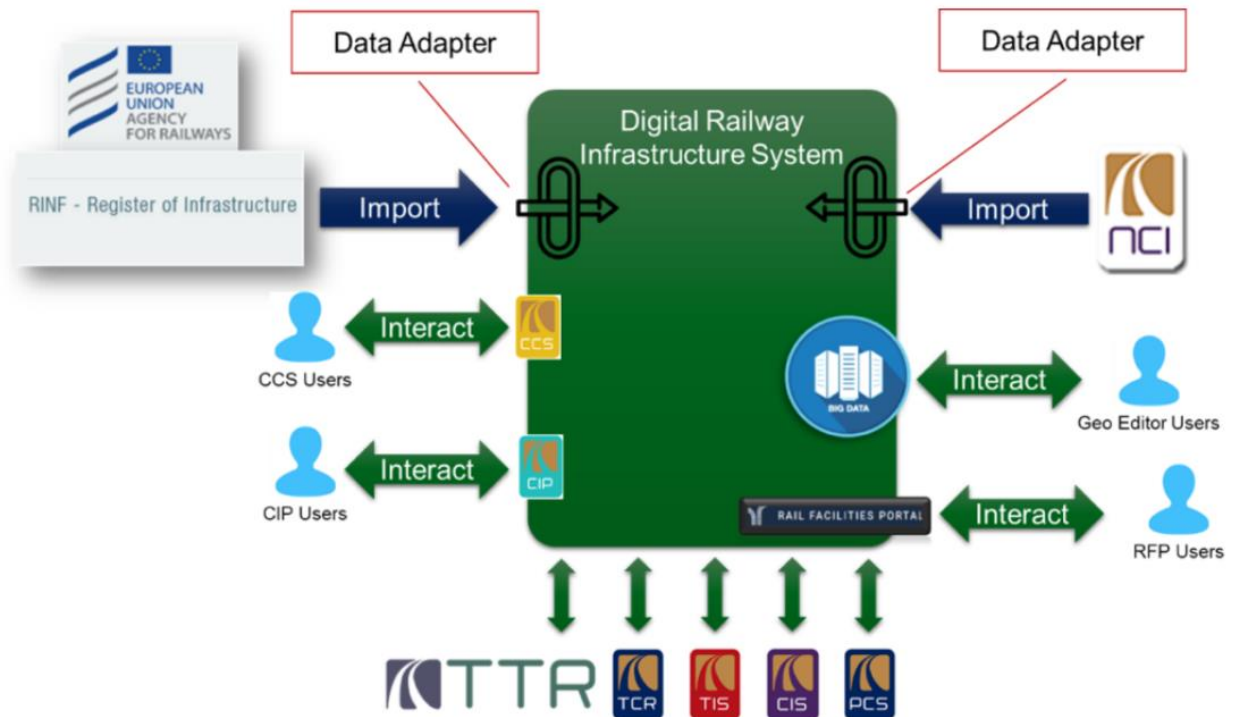
Use of the TCR tool is free for all RNE infrastructure managers and customers licensed to any of their networks. Any other cases are covered by other tariffs.

The European Capacity Management Tool (ECMT) is an online application that provides centralized line and route capacity.

Use of the ECMT tool is free for all RNE infrastructure managers and customers licensed to any of their networks. Any other cases are covered by other tariffs.



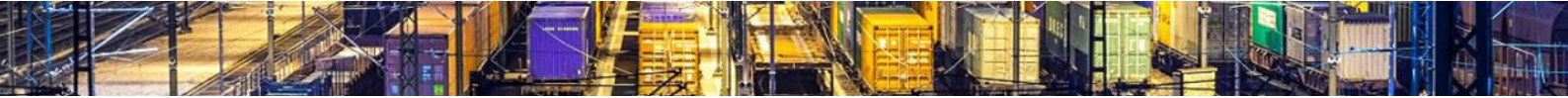
RIS (Railway Infrastructure System) - consolidated digital platform, combining several existing systems containing parts of the data of the digital infrastructure such as CRD (Central Reference Files Database), Geo Editor, CIP (Customer Information Platform) and RFP (Rail Facilities Portal), and use of RINF (Register of Infrastructure) as a data source for railway infrastructure.



RNE conducts training sessions and special events to highlight the main functionalities of the key IT tools presented above.

From global national multi-tasking projects, turn to commercial structures and consider the technological solutions that are now available in the modern digital services market in the railway industry, to so-called B2B Rail Logistics Platforms.

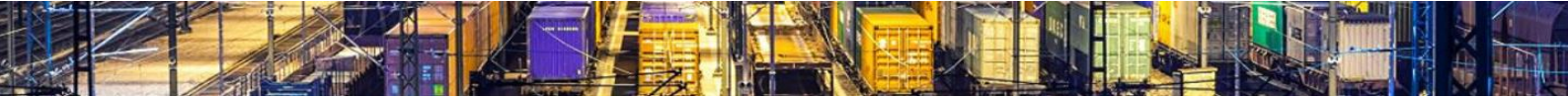




What are the expectations and requirements for logistics digital service providers?

- *Reliability and high quality*
 - *Innovation and flexibility*
 - *Accessibility and openness*
 - *Competitive and low prices*
 - *Resilience*
 - *Professionalism and partnership on equal terms*
-





Railway exchange

Rail Cargo Group

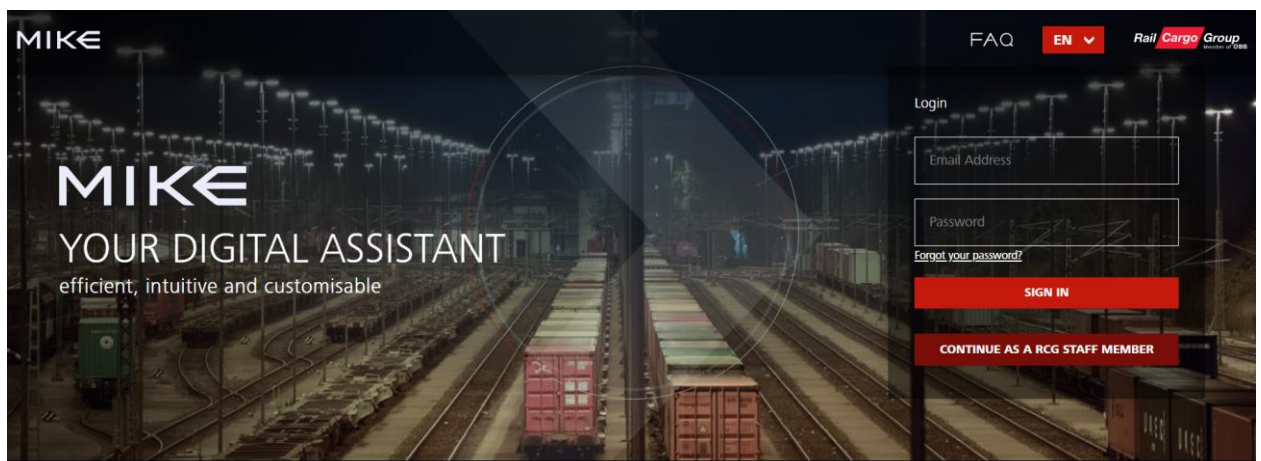
ÖBB-freight - European multimodal rail logistics provider using land, water or air transport.



Pre-tax profit (EBT) -13.0 million Euro Offers logistics solutions from the first mile to the last mile for a wide range of industries across the entire European continent.

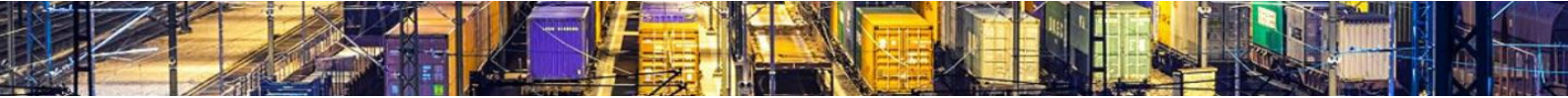
Presence in 18 countries, 16 own terminals and 10 logistics centers, processing, storage or customs clearance, about 6,000 employees, 1,150 trains per day, 710 tractor vehicles, 24,263 freight cars, 78.5 million. net tonnes/year.

The company has its own digital platform MIKE, supporting logistics processes and digital service e-Services.



Features of the MIKE platform:

- Simplified cooperation
- Transparency and process integration
- Support of logistics processes



Tools:

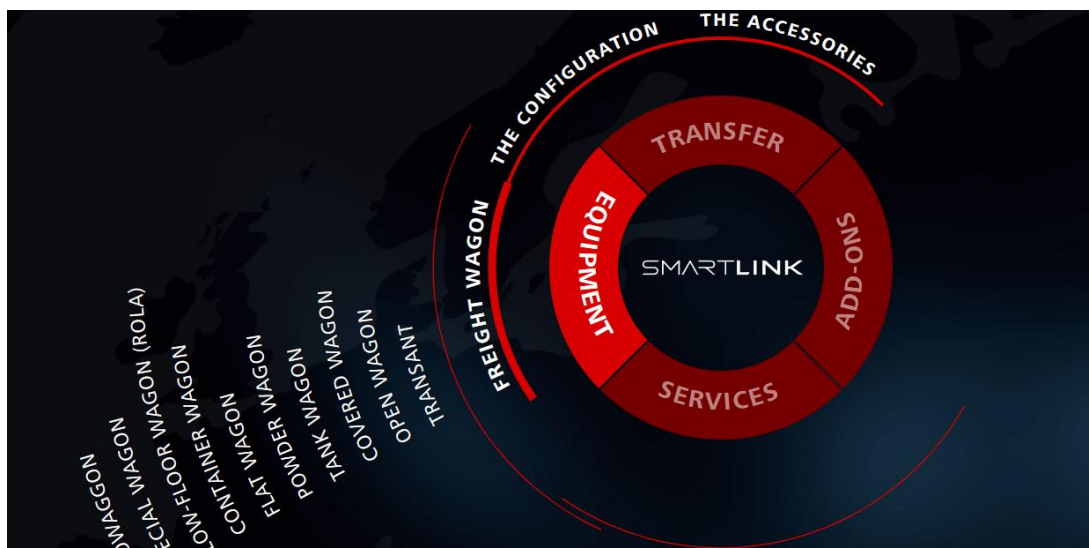
- Formation of orders and contracts for carriage
- Detailed tracking and control of shipments and wagons
- System solutions in the app
- Interface solutions for automated data exchange
- Sales Key-Accounter

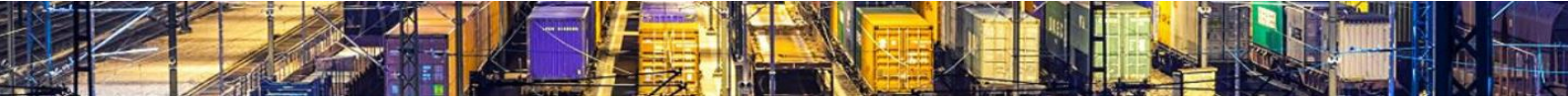
MIKE Interface solutions provide access to the following services directly from the client's proprietary system via REST API:

- • Empty wagon order
- • Tracking - complete and continuous tracking of shipments, including wagon data and shipment
- In addition to the MIKE REST API, MIKE interface solutions also in XML, FTP, SFTP:
 1. Reservation of capacity in carriage. (ideal for transport on own Rail Cargo Group or with partners Xrail)
 2. Application for carriage
 3. Registration of empty or loaded wagons
 4. Automated information on the status of a wagon - WSM
 5. Online monitoring of freight train routes

For clients who do not have a permanent contractual relationship, SmartLINK is offered with 4 sections: graphical or individual TransFER lines, acquaintance with the available equipment, as well as with current services and additional services.

The Annex is available in English, German and Hungarian.





How to access MIKE?

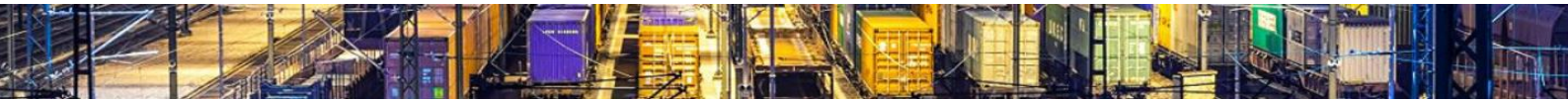
- Corporate customers apply for their MIKE user by sending a completed registration form. The customer data record (customer number and name of sales contact person RCG) allows to initiate all further steps.
- Verification, authorization and creation of a MIKE user takes 1-2 working days. Once the MIKE user is created, the necessary information will be sent by e-mail.
- The MIKE basic package with all current digital services is available to customers for free. Future modules or advanced functions in the module can be paid.
- For the purpose of data protection, all users of a company interested in the services provided receive their own user profile.

Digital service e-frachtbrief@ (consignment note) - system certified solution from reservation of capacities, including order of empty wagons, and until the formation of the order for carriage. Processes are based on quality-tested templates.

Application developed for JRE Version 8 Update 161 (Plugin 1.8.0_161).

Web: <https://mikerailcargo.b2clogin.com/>





RAILVIS

RAILVIS is the European online platform for rail business, bringing together rail carriers and operators, freight forwarders, leasing companies, manufacturers and logistics companies.

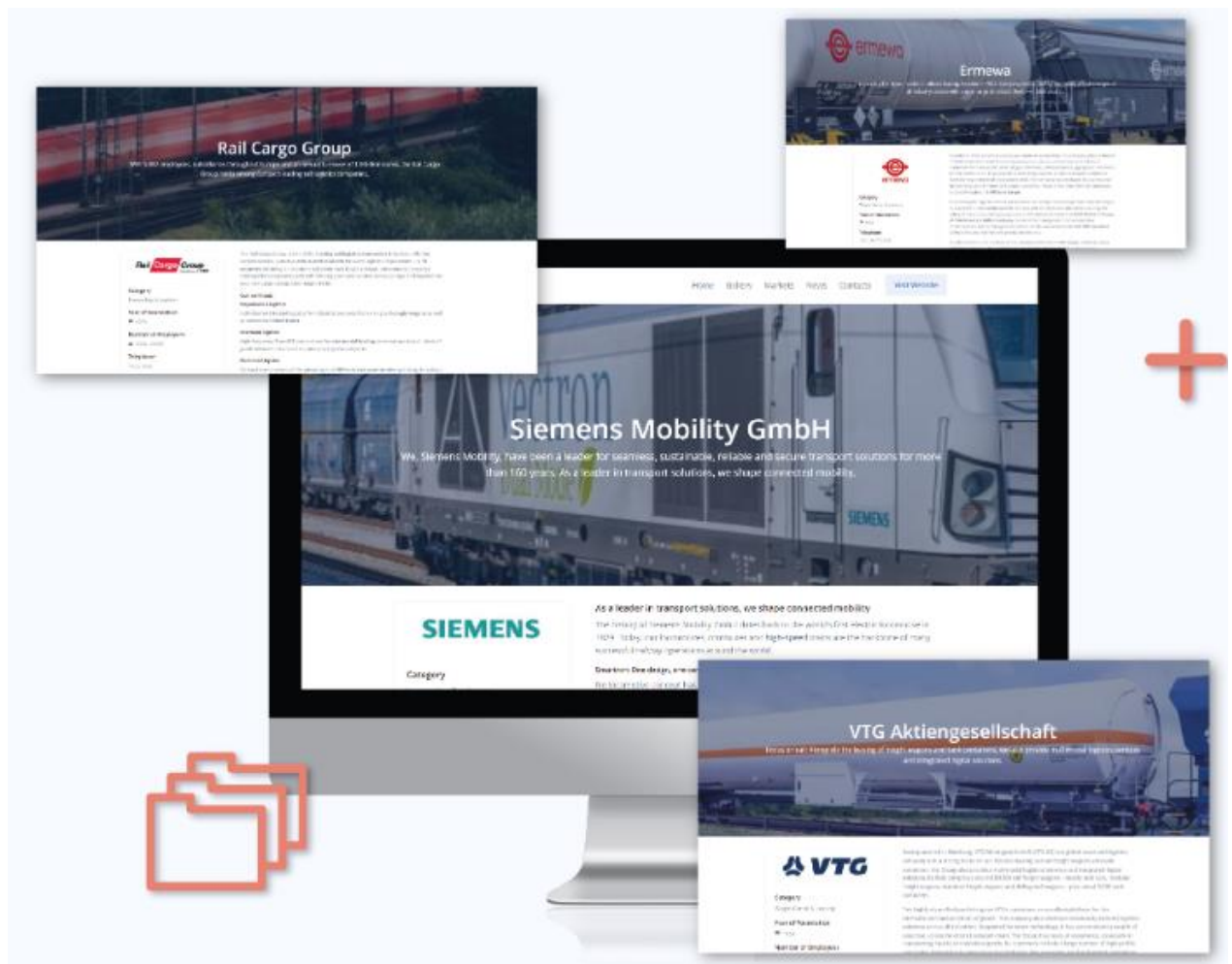


Founded in 2019, the main office is located in Prague, Czech Republic, with additional offices in Germany, Italy, Poland and Turkey.

Available in 9 languages. Paid access. Business model based on annual fee.

Has a database with 4,415 railway companies in 80 countries, 63 categories for navigation, 2,338 published offers, 321 registered companies, 2,049 users.

Modern online maps of railways, industry news available.





How the RAILVIS platform works?

The customer, for example a rail freight forwarder, needs to transport 1,000 tons of cargo from Rotterdam to Budapest. He fills the platform with the most important data for his project.

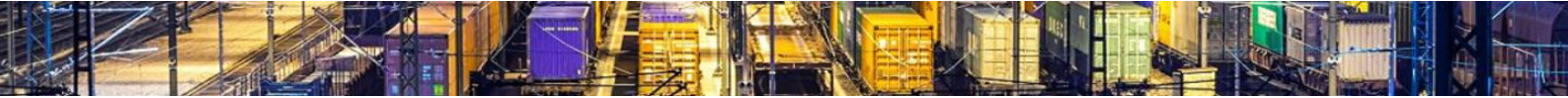
The system then recognizes all available routes (alternative through Austria or the Czech Republic), all border crossings, and requests to all carriers - national, private and the smallest regional carriers, who can offer either the entire route or only a part of the territory they know best. The system can then combine subroutes from different carriers and finally add up a common price. This gives the customer a choice of different solutions - the whole route with one carrier or a route consisting of several carriers. The final choice of solution is left to the customer based on price level, capacity, suitable route and transit time or experience with carriers.

It is also possible to use the spare capacity of existing trains: the railway operator plans a full train from point A to point B. Up to 2,000 tonnes of cargo can be transported on this route, but the carrier will only use 1,400 tonnes for its train. The remaining capacity of 600 tons can be offered on the pan-European market, and other operators can add individual wagons or locomotives at very favourable conditions.

The same applies to locomotive mileage, that is, the locomotive travels a greater distance completely empty. Of course, it is also a matter of chance that the requirements for similar route and time coincide with different companies.

Web: <https://railvis.com/>





Klusii

Klusii is the digital expert platform of German consulting company SCI Verkehr, specialized in strategic issues of international rail and logistics business.

Klusii
by SCI Verkehr

SCI/Verkehr

Subscription

The first three months of the basic rate are free, the following ones - 39,00 € per month.

The Premium rate from 1 to 3 months is free, following - 79.00 € per month.

Diamond Tariff - 199,00 € per month.

Single user license. Monthly Cancellation

KLUSII offers a structured overview of individual digital solutions and their suppliers, and allows combining business applications, namely to use the platform as a new sales channel for the rail sector, presenting functions and solutions in a holistic context and creating transparency with respect to interfaces.

Platform offers digital industry company map of the rail market and their service portfolio: shows company size, main customers and investments, supplier history, customers and reviews.

Klusii

- Home
- News
- Blog
- Process
- Solutions
- Companies
- Favorites

The screenshot shows the Klusii platform interface. It features a navigation menu on the left with options like Home, News, Blog, Process, Solutions, Companies, and Favorites. The main content area displays two news articles: 'Accelerating Ahead: Digitalisation in European Passenger Rail' and 'DSB puts IVV solution for personnel planning into operation'. To the right, there are two large numbers: '67' under 'Concepts' and '117' under 'Solutions'. Below the news articles, there are two tables: 'Newest Solutions' and 'Newest Companies'. The 'Newest Companies' table is partially visible below.

Name	Country	Employees	Solutions
Infys	Germany	6	3rdRailPost, RailCheck
Bacheler Techn.	Germany	12	STC/STW, ST/STW/ST
Verkehr Security	Local	100	Track System
Accord	Poland	55	Urban Rail, Urban Train
AREYS	Poland	26	RailKit, RailTrack

Constantly updated information on digital

events in the industry, new proposals and recently implemented solutions, news and reference information in the railway and logistics industry is available.

SCI Verkehr has also created SCI RAILDATA, a market analysis platform for decision makers in the railway industry, with a free trial version.

Web: <https://www.sci.de/>
<https://klusii.com/>



Modility

Modility - Hamburg's platform for booking combined transport and brokerage services for intermodal transport. Modility's parent company - HHLA (Hamburger Hafen und Logistik AG), is a German logistics company specializing primarily in port transshipment and container and transport logistics.



Platform allows users to book road and rail transport, transport operators.

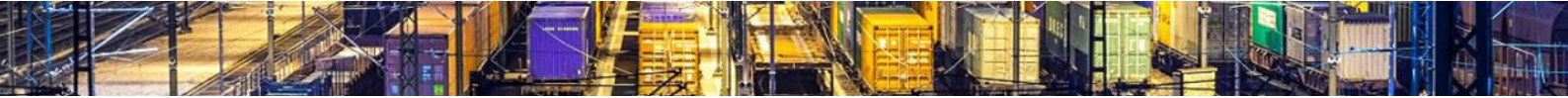
To book the service, users must register on the platform, specifying the destination address and planning requirements based on weight of the cargo, units, dates etc. The customer should be able to request the service.

Subscription models for customers

- Free: Overview of KV options.
- Standard 69 € per month (trial month free): Real-time price information. Comparison of providers. Booking process 2.0. Review of the reservation. Up to 3 users. Personal support. Booking chat. Download file. Backup data. Interactive guides. Mobility community. TEU & More Bonus Program.
- Premium 129 € (trial month free): all from «Standard» plus:
Individual rates. Regular business requests. Up to 15 users. Up to 5 locations. Interfaces. User groups.
- Enterprise (on request): everything from «Premium» plus: Unlimited number of users and locations. Illustration of special rates and named account (NAC) rates including booking.

The Modility network includes more than 800 trains from over 50 operators from 13 countries in Europe and 141 terminals.





How to book a transport with Modility?

Step 1: Search for transport

Enter the departure point, destination, date and enter additional information if necessary

Step 2: Choose the sentence

Sort the results list according to your individual requirements and select the suitable transport.

Step 3: Booking a transport

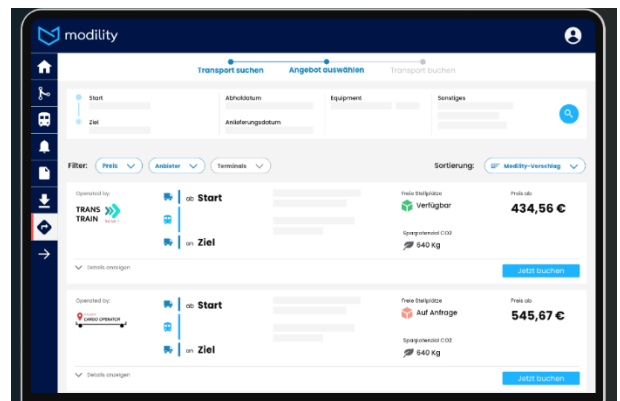
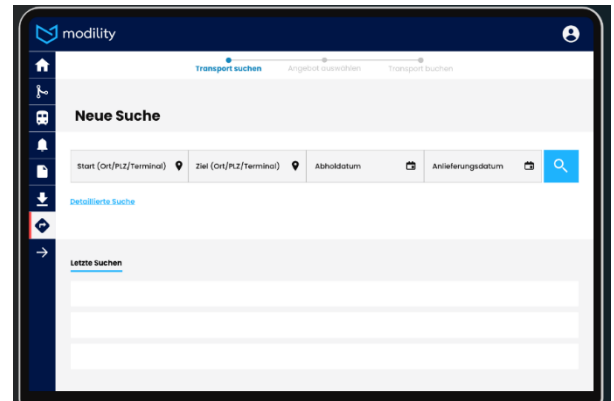
Enter the required information, check the data and order the transport directly from the provider

Additional functions:

- Different business units or legally independent companies can be merged into one account, but managed independently of each other.
- Built-in chat function
- Customer address book
- Interactive guides
- Intuitive user interface
- News portal

Web: <https://modility.com/de/>

The technical development of Modility innovations was funded by the Federal Ministry for Digital Technology and Transport (BMDV) of Germany within the framework of the federal program «Future of rail freight».





RWS Маркет

RWS Market is a Ukrainian information and communication platform that provides up-to-date information on manufacturers and suppliers, their products and services. Part of the Railway Supply information portal.

Available functions:

- Search by both suppliers and categories.
- Profiles of companies working in the railway industry, detailed descriptions of goods and services.
- Rail freight services.

In the categories:

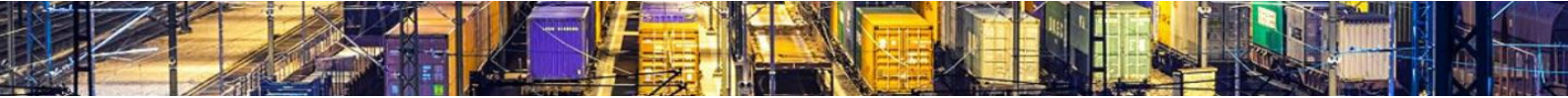
- Freight transport rail
- Railway fasteners
- Rail transport
- Parts for Diesel Trucks
- Diesel parts
- Other rail services
- Travel tool
- Wagon repair
- Track repair
- Repair of locomotives
- RTI for rail transport

Placement of goods and services in RWS Market (per year):

- 10 goods (services) - 10000.00 UAH.
- 20 goods (services) - 15000.00 UAH.
- 30 goods (services) - 20000,00 UAH.

Web: <https://www.railway.supply/rws-market/>





In addition to the platforms-exchange of rail transport, this market is represented by copies developing digital software solutions for logistics, present for the view of the solution of German colleagues.

ZEDAS

ZEDAS GmbH develops software products for the management of rail logistics, as well as for the management of vehicle fleets and technical assets. The zedas® solution is an integrated solution for rail and transport companies, from logistics management to maintenance. Available in 4 languages.

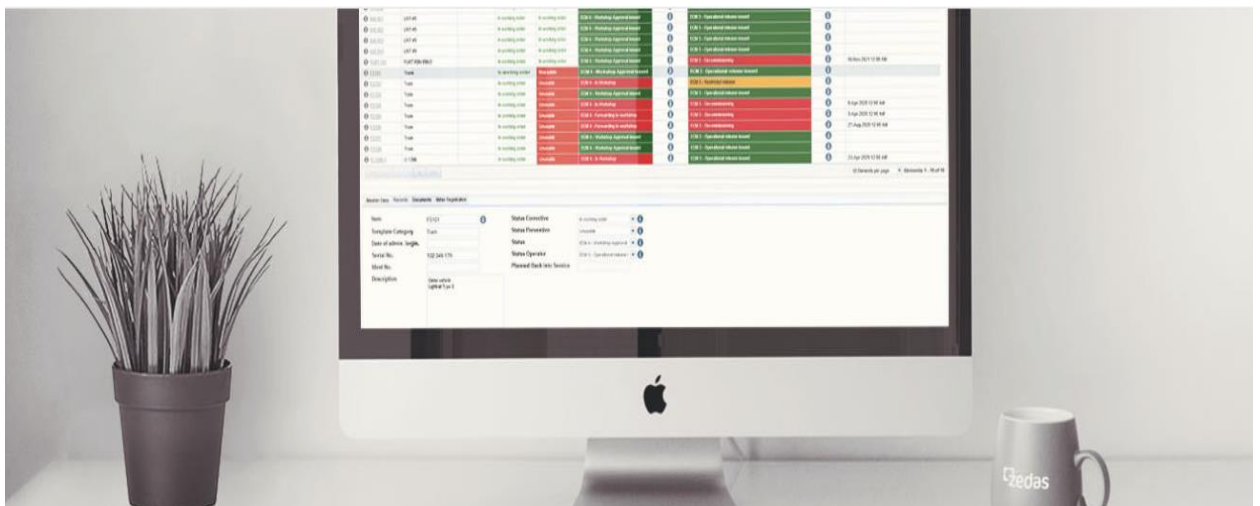


Seamless integration of business support modules (zedas®cargo) with enterprise technical asset management modules (zedas®asset) opens up great opportunities for more efficient and competitive delivery, planning and execution of transport operations, especially for rail companies with intensive assets and infrastructure.

Integrated Rail Management combines:

- Maneuvering logistics
- Long-haul logistics
- Rail infrastructure maintenance
- fleet maintenance
- The ability to create more optimized and efficient service processes for rail and transport companies.

zedas® cargo - an integrated standard solution for rail freight logistics management (RFT).



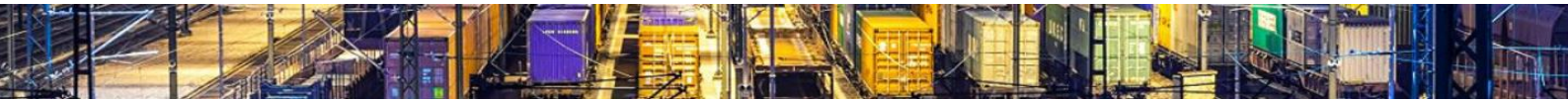


The system brings together all participants inside and outside the company, and digitally displays typical processes along the value chain: commercial processing (from order to payment), planning and operational management, as well as control and suitable for all railway undertakings (RU) that operate in the area of block trains or intermodal transport/combined transport.

Tools:

- **Calculation.** All service components of rail transport are calculated in zedas®cargo. As a result, cost options can be quickly developed and compared, and thus attractive offers created.
- **Contract.** In the decision all information about contracts and orders is managed and becomes available for further steps. All factors such as production pattern, supply volumes and quality targets are considered. Consistent rules for distribution of messages and documents are maintained. Automatic messages, such as the provision of wagons, departure trains or delays, optimize the customer experience.
- **Planning.** The system optimally supports staff in planning and dispatching, preparing regular and special shipments. They get a quick overview of the use of resources. Software automatically checks working hours, collective agreements and staff qualifications and credentials.
- **Operation.** Using the central graphical overview, operations management is always up to date with the current order and train traffic situation. Operations management is supported in processing, monitoring and documenting train services. The projected and actual deviations are displayed, allowing for corrective action to be taken promptly. Train information is available to clients and partners in real time on request. Mobile apps help train workers prepare trains, manage damaged cars or record actual working hours.
- **Billing.** The actual data collected during the operation is automatically published in orders and transferred to billing. Billing clients and partners is transparent and fast. Automatically managed time accounts of staff greatly simplify payroll. Prepared data can be transferred to external systems through interfaces.
- **Control.** All data for comparison of target and actual indicators, post-calculations, statistics and key indicators are available automatically and immediately after the service is provided

Web: <https://www.zedas.com/>



Conclusion

The future of rail transport is behind digital technologies, with the introduction of which we are entering a new era of efficiency and transparency.

Logistics responds to the digital transformation of the economy with innovative digital solutions and network holistic concepts.

According to the International Energy Agency, rail transport accounts for only 1% of greenhouse gas emissions.

However, great attention is being paid to decarbonization of rail transport, in particular the reduction of diesel fuel use. Electrification is key in this regard. Europe has around 54% of its railways electrified.

The targets for increasing electrification set in a number of countries, such as the UK and Germany, have not yet been met because they are time- and money-consuming and not always economically viable.

Nevertheless, this sector of the market in Europe is growing at a rate of about 8% per year.

The sustainability orientation of many countries around the world has placed challenges on the rail industry in areas such as energy efficiency in energy-intensive production processes and operational technologies, renewable energy transition, Use of sustainable materials throughout the life cycle and digitalization in building infrastructure.





In recent years, AI has received a strong impetus to development due to technological breakthroughs, increasing the amount of data and improving approaches to working with it, increasing internet speed and network coverage, developing e-commerce, Introduction of AI regulation at the legislative level and tightening of environmental requirements.

Many logistics and rail transport companies identify internal process efficiency and productivity as the most beneficial benefits of AI technology development. In freight transport, companies assess the most important impact of AI on financial results, internal processes and processes of interaction with counterparties.

However, not everyone agrees with digital innovations as they are interpreted as digital pressure. More than 60 German organizations, including the Association of German Railways Customers, share this position and call for the right to life without digital coercion to be enshrined in state law. More and more public services are offered exclusively in digital form, and the use of analog technologies is becoming increasingly difficult, with more people exposed to isolation and discrimination.

Digitalization in business also carries certain threats and problems, such as increased unemployment, weakening social skills and sense of community, increasing levels of fraud, data loss risks and privacy, possible IT system service failures, errors, crashes. However, we see that digitalization of logistics with the introduction of AI and neural networks minimizes costs and leads to cost reduction, increasing freight efficiency and reducing delivery time.





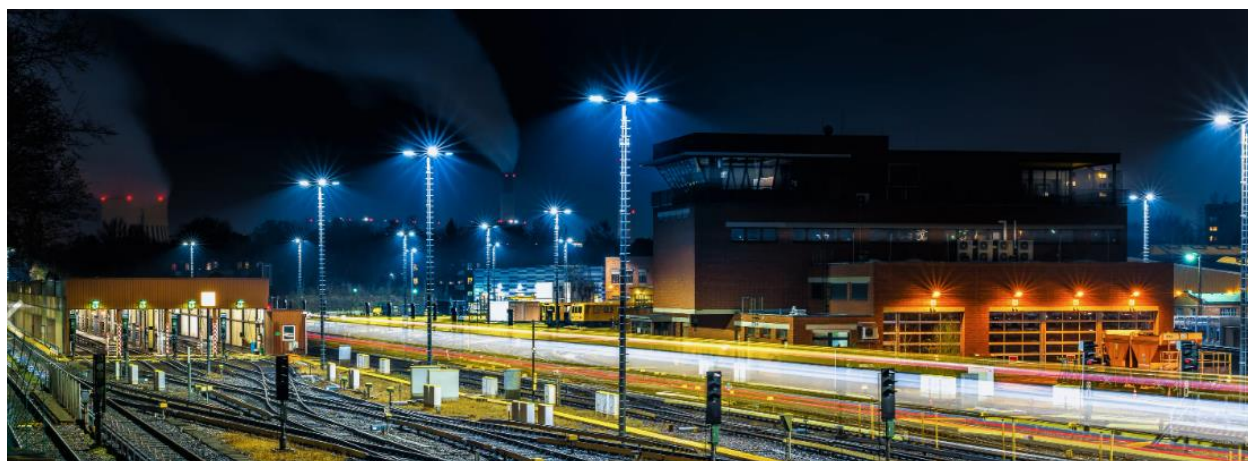
One of the unseen trends in digitization of logistics is the use of artificial intelligence and machine learning to forecast freight demand and optimize delivery routes. This allows logistics companies to distribute free moving equipment or transport in the right regions in a timely manner, thus avoiding shortages or useless downtime in one or another entity. This is particularly important in the context of complex global supply chains.

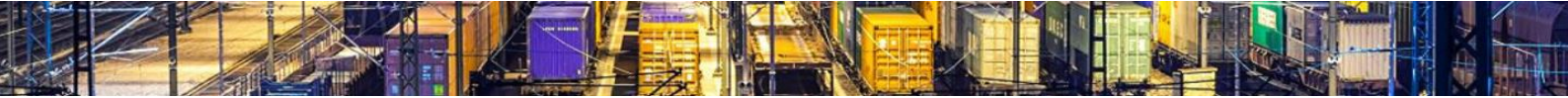
In addition, the network can help to build or optimize logistics routes, monitor the state of transport and also use blockchain technology to increase the level of data storage reliability and transparency access to them.

But it should not be forgotten that the channels for the transmission of commercial information within the electronic document circulation still remain vulnerable to hacker attacks. In 2017, servers and computers of one of the largest transport and logistics groups in the world - A.P. Moeller (diversified conglomerate operating in the field of shipping, oil and gas industry, shipbuilding, retail trade, information technology and other industries) were hacked, which caused her work to be virtually paralyzed for several months. That is why today it is still worth keeping some of the duplicate functions in the format of classic paper documents for a while, which will allow to avoid similar situations in the future.

This review lists only some of the European participants in the digitalization of logistics and solutions, private and combined into professional international coalitions, B2B platforms and integrated software modules as examples of large, fast-growing, technologically advanced supply chain companies ready for transformative growth. Parallel digital processes are taking place on other continents, surrounded by the railway network, transforming industry trends and restructuring best practices of innovation implementation.

Our company wishes you success and prosperity!





Glossary

ETCS (European Train Control System) is a signalling element of the system, comprising traffic control, automatic train protection and an interface with centralisations. Allows to gradually reduce the complexity of the work of machinists (automation of control actions) - Moves the alarm from the driver's cab - Provides information on the on-board display - Allows for constant monitoring of trains - Train operator focuses on the main tasks.

ETML (European Traffic Management Layer) is a level of operations management designed to optimize train traffic by «intelligent» interpretation of train schedules and train traffic data. It includes improvement of: real-time train management and route planning - flow of railway nodes - information about customers and service staff.

European Train Control System - This component of ERTMS guarantees a common standard that enables trains to cross national borders and enhances safety. It is a signalling and control system designed to replace the several incompatible safety systems currently used by European railways. As a subset of ERTMS, it provides a level of protection against over speed and overrun depending upon the capability of the line side infrastructure.

Capacity allocation - The process by which capacity is granted to a Railway Undertaking or to any other Applicant by the IM/AB/C-OSS; this capacity will later be used as actual train paths.

Capacity management - The capacity management is a business field in railways to ultimately balance capacity supply against capacity demand.

Capacity model - Capacity Model (X-36 to X-18 months) with Capacity Partitioning: The Capacity Model gives a more detailed definition of the demand forecast and requires the partitioning of capacity into volumes for passenger and freight traffic and Temporary Capacity Restrictions. Furthermore, it also allows a more detailed capacity partitioning based on product point of view (Annual Planning, Rolling Planning, Ad hoc and unplanned capacity (where available)). Applicants have the possibility to give input into the Capacity Model by announcing their Capacity Needs and can provide their reaction on the proposed capacity partitioning.



Capacity strategy - The capacity strategy is a strategical document for the long-term capacity planning of the IM for a dedicated line, a part of a network or an entire network. The major aim of the capacity strategy is to provide a first overview of available capacity on the infrastructure in the future and to set the general principles to be applied in the capacity planning (capacity model elaboration, TCR planning etc.).

Carrier - Means an enterprise which carries out a transport operation pursuant to a contract of carriage/ OTIF definition: 'the person who carries persons or goods by rail in international traffic under the CIV Uniform Rules or the CIM Uniform Rules and who is licensed in accordance with the laws and prescriptions relating to licensing and recognition of licenses in force in the State in which the person undertakes this activity.' ['person' here meaning the legal entity]

General definition: organization that undertakes transportation of goods by sea, surface or air. 'Contracting Carrier' means a person or company who as a principle makes an agreement for carriage with a passenger or the consignor. 'Actual Carrier' means a person or company other than the contracting carrier, who, by virtue of authority from the contracting carrier, performs the whole or part of the carriage.

Consignee - means any natural or legal person who receives goods pursuant to a contract of carriage; if the transport operation takes place without a contract of carriage, any natural or legal person that takes charge of the goods on arrivals shall be deemed to be the consignee.

Consignor - means an enterprise which consigns goods either on its own behalf or for a third party.

Contracted TimeTable - It defines the planned route and planned time of a train run. It is delivered by Message 2090 from the IMs to TIS, and merged into an international timetable by TIS.

Corridor One-Stop Shop - The management board of a freight corridor shall designate or set up a joint body for applicants to request and to receive answers, in a single place and in a single operation, regarding infrastructure capacity for freight trains crossing at least one border along the freight corridor.

Dedicated capacity - Capacity that has to be jointly defined and organised by the Infrastructure Managers of a Rail Freight Corridor to fulfil the requirements of EU Regulation 913/2010. It refers to pre-arranged paths (PaPs) and reserve capacity.



Estimated Time of Arrival - 'Estimated Time of Arrival of wagons at the customer side.' The ETI/ETA calculation is based on the information from the infrastructure manager in charge, which sends, within the Train Running Forecast message, the Train Estimated Time of Arrival (TETA) for defined reporting points (in any case for handover, interchange, or arrival points including Intermodal terminals) on the agreed train path e.g. for the handover point from one IM to the next IM (in this case TETA is equal to ETH).

Estimated Time of Handover - Estimated Time of Handover of a train from one IM to another.

First come, first served principle - A principle based on the rule that the applicant requesting a particular product at a certain point in time receives the product earlier or is given preference over an applicant who requested that product later.

Freight forwarders - Companies/persons responsible for dispatching freight traffic to its destination.

Network PaP - Network PaPs (NetPaPs) are pre-arranged paths designed to foster the optimal use of infrastructure capacity and address the needs for capacity on specific geographical traffic routes or market segments with special requirements for train path characteristics. They may be offered on a single Rail Freight Corridor, or on two or more connected Rail Freight Corridors. Network PaPs consist of contiguous pre-arranged path sections linked together. They are identified by a special ID or marker in pre-arranged path catalogues and IT tools.

One-Stop Shop - A one-stop shop is a single point of contact. The Infrastructure Managers who are members of RNE have set up 'One-Stop Shops' working as national customer contact points. For international train path requests, the customer needs only to contact one of these One Stop Shops, which will initiate the whole international train path allocation process. The OSS aims to provide competent and efficient assistance across all borders, based on transparent, confidential and non-discriminatory procedures.

TAF TSI definition (this only concerns freight traffic, as TAF only deals with freight): 'An international partnership between rail Infrastructure Managers providing a single point of contact for rail customers for the purposes of:

- ordering specified train paths in international freight traffic,
- monitoring the entire train movement,
- generally, also invoicing track access charges on behalf of IMs.



Rail Freight Corridor - all designated railway lines, including railway ferry lines, on the territory of or between Member States, and, where appropriate, European third countries, linking two or more terminals, along a principal route and, where appropriate, diversionary routes and sections connecting them, including the railway infrastructure and its equipment and relevant rail services in accordance with Article 5 of Directive 2001/14/EC.

Route - The particular section or sections of line.

Shipper - The contracting party (person or company) entitled to give orders and instructions about its shipment to the accepting (issuing) carrier, simultaneously assuming full responsibility for any charges arising, until the moment the consignee has signed for receipt.

Transshipment / trans-shipment - The operation of moving goods cargo items or unit loads from one vehicle to another or to and from storage.

Unit train - A freight train dispatched with only one consignment note and only one type of goods and composed of uniform wagons running from a consignor to a consignee without intermediate marshalling.

Wagon load - A unit load whereas the unit is a wagon.

