Rail Transport: Rolling Stock

Manage, service, and maintain assets safely and cost-effectively. Comply with regulatory oversight.

IFS

Introduction

The world relies upon rail companies to transport people and deliver goods to market safely and reliably. While the model is simple (load, transport, unload), the underlying processes are multi-layered and intricate. Simply ensuring that a train departs and arrives on time depends upon millions of variables.

Effective asset management is complicated within such a challenging environment where the failure of a single asset can easily sideline large, powerful locomotives. To keep the trains rolling (literally), rail companies must embrace innovation, digitalizing the operation to support data-based decisions that optimize safety, quality, and reliability.

Along with these priorities, rail transport companies face the same pressures as other industries. For example:

Sustainability

Commitments relative to environmental, social, and governance (ESG) objectives.

Customer experiences

Consistently excellent interactions to remain competitive within the market.

Health of the company

Satisfy the expectations of shareholders and other stakeholders in the business.

IFS is paving the way for rail transport companies as the industry evolves, helping the organization deliver on its commitments while supporting a profitable business model.
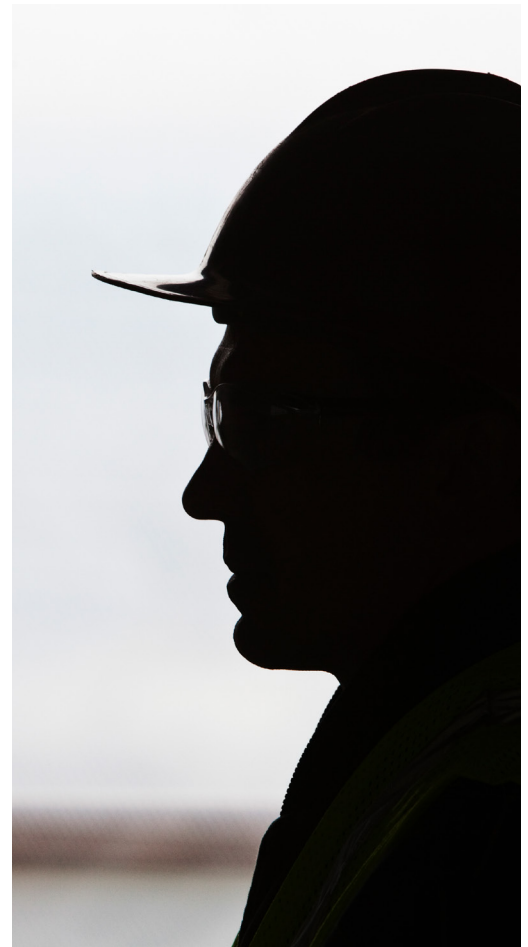
The Industry

Global rail transport is predicted to grow to <u>$748.97 billion by 2028</u>, with a compound annual growth rate (CAGR) of 6.5%.

The Rail Transport Global Market Report 2024 attributes the growth to high-speed trains, technological advances, and an emphasis on cutting carbon emissions.

$ 748.97 billion

Predicted growth for the global rail transport market by 2028

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With stable economic growth forecasted in developed and developing countries, the demand for rail freight transport will continue to grow, in turn stimulating growth in railroad construction.

In Europe, rail freight transport increased 8.7% in 2021 compared to 2020. In the US, rail traffic involving containers and trailers increased by 5% in 2023 versus 2022.

Regulatory Oversight

Given a nation's dependence upon the movement of domestic and international freight, railways and the companies that use them must comply with corporate and regulatory oversight to ensure the safety of workers, communities, and the environment.

In the United States, railroads are federally regulated, mainly through the United States Department of Transportation. The Federal Railroad Administration oversees safety, while the Surface Transportation Board regulates rates, service, construction, acquisition, and abandonment of rail lines, carrier mergers, and traffic interchange among carriers.

In Europe, the landscape is much more complex. While efforts are underway to support trans-European freight trains, divergent standards by country for electrification, loading gauge, signaling, driver certificates, and gauge continue to impede progress.

These varied standards and regulations complicate the transport of people and goods across Europe.

New European Regulation (EU) 2019/779

In June 2019, the European Commission introduced Commission Implementing Regulation (EU) 2019/779, replacing (EU) 445. The new regulation lays down detailed provisions on a vehicle certification system of Entity in Charge of Maintenance (ECM).

ECMs underline safety within the European railway system, ensuring the rail vehicles run safely using a maintenance system. While the previous ECM certification scheme only required ECMs of freight wagons to obtain a certificate, the new regulation expands the requirement to ECMs of all vehicles on the mainline railway.

Additionally, rail companies must produce and file documentation centrally regarding vehicle maintenance strategies and specifications, establishing an ongoing and comprehensive lifecycle file of the rail vehicles and related components.

Industry trends

Digitalization is a critical driver in the modernization of rail transport, helping to address many of the challenges companies face today:

- Pressure to increase efficiencies and cost-savings with limited budgets and a lack of skilled workers.

- Better parts management to offset inconsistencies within the global supply chain.

- The rapid adoption of new technologies within established (and often legacy) IT environments.

Advances include the networking of existing infrastructure, cloud-driven automation, IoT, artificial intelligence (AI), augmented reality, and other developments.

Rail transport companies are actively engaged in the adoption of analytical AI, focusing efforts on shift planning and energy efficiency. According to a report by McKinsey, rail companies that employ AI-enabled technology for crew and shift planning achieve 10-15% optimization in shifts and reductions in labor costs.

10-15%

Optimization in shifts with AI-enabled technology

Enterprise asset management

While rail transport is a unique and specialized industry, the foundational aspects of asset management parallel most other sectors.

For example, every operations team must be able to continually examine and adjust asset performance and other conditions in real-time to maximize efficiencies in productivity, costs, and time. Parts inventories must be monitored constantly to ensure stock is adequate for immediate and future work. Additionally, the workforce must be actively managed to provide enough people with the qualifications and skills to undertake asset maintenance and service initiatives.

IFS has substantial experience implementing asset management solutions for rolling stock companies and the aerospace and defense industries. With expertise in handling complex assets and configurations, rail transport companies benefit from proven, best-in-class EAM practices.

IFS Cloud EAM, powered by AI, provides a flexible framework that supports the company every step of the way, no matter the size or complexity of a job. From managing diverse assets across the operation and beyond, predicting (and preventing) failures and disruptions, and carrying out planned maintenance cycles, IFS maximizes the profitability of rolling stock assets by reducing the cost of management and extending lifespan.

KEY benefits of IFS Cloud EAM

1. **Cost savings & efficiencies:**

   Reduce operational costs to minimize downtime and optimize asset utilization. Real-time data analytics enhance decision-making for improved efficiency and lower overall maintenance costs.

2. **Regulatory compliance:**

   Comprehensive data management and reporting capabilities simplify proof of compliance workflows, reducing administrative burdens for an audit-ready operation.

3. **Enhanced asset value:**

   Manage the entire asset lifecycle with integrated project and supply chain management for streamlined operations, better resource allocation, and improved asset reliability.

Rail Transport: Rolling Stock

Register & Track Assets

The volume and variety of rolling stock assets are staggering. With IFS, rail transport companies easily track and monitor maintenance demands and other operational data for a robust asset register.

For example, information such as equipment structures, documentation, criticality analyses, maintenance, and incident history. Structured failure mode analyses and extensive preventive maintenance coverage are also registered within the system, helping to support regulatory oversight and compliance, including ECM regulations in Europe.

IFS Cloud EAM provides comprehensive attributes to describe assets, sub-assets, and other components. These attributes and data collected over the entire lifecycle of an asset create a digital thread, helping rail transport companies to streamline workflows, improve decision-making, and reduce errors.

Manage Maintenance

The maintenance and servicing of rolling stock enables railways to eliminate unplanned downtime and other disruptions that impact reliability, availability, and the safety of the operation.

A 2022 paper by ResearchGate ranks rolling stock variables with the highest influential maintenance costs.

Over 30% of rolling stock maintenance costs are dedicated to spare parts, life cycle, and preventive maintenance. The organization achieves considerable savings with effective planning, scheduling, and parts management efficiencies.

With IFS, maintenance requirements are defined for every asset to ensure service is scheduled optimally, never early – or worse – too late.

The system provides:

Work orders: Definition of the requirements and the problem

Work tasks: Activities to perform

Work assignments: Management of the allocation of resources

Heavy and light maintenance workflows are supported via preventive maintenance programs, on-condition maintenance, modifications, and predictive and prescriptive maintenance.

30%

Costs for spare parts, life cycle, and preventive maintenance

Plan and Schedule Maintenance

As an asset-intensive industry, rail transport companies rely on maintenance planning and scheduling to maximize asset yield and life.

IFS Cloud EAM utilizes powerful AI, machine learning, real-time data, and automation to help drive valuable efficiencies in planning and scheduling. Proprietary algorithms are executed in milliseconds to identify the best-fit specialist, third-party service provider, the necessary parts and tools, and additional considerations.

Response times are narrow and inflexible for rail transport companies, especially when coordinating parts and people in scenarios where other trains and schedules are impacted. All hands (and parts) must be on deck when the rolling stock arrives at the repair shop.

Real-time Resource Management

IFS manages the scheduling of workers in real-time, running and ranking available people to intelligently identify the best option. The system is intelligent, factoring in scheduled work to satisfy all obligations. Parts planning is also coordinated alongside workers to ensure a consistent first-time fix rate.

Given the random nature of emergency repairs, this automated approach to scheduling allows planners to focus on exceptions, increasing overall productivity.

Work Planning & Scheduling

- Site-based
- Planned work
- Activity-driven planning & allocation

Resource Allocation & Monitoring

- Manual allocation of planned & reactive work
- Allocate resources
- Monitor and follow-up work

Dynamic Scheduling

- Geographically dispersed
- High volume
- Appointment booking
- In-day dynamic optimization

Enterprise asset management (Long-term)

Service/Asset Management (Shorter-term)

Parts & materials

Access to the right parts at the right time and place is critical to optimize rolling stock performance.
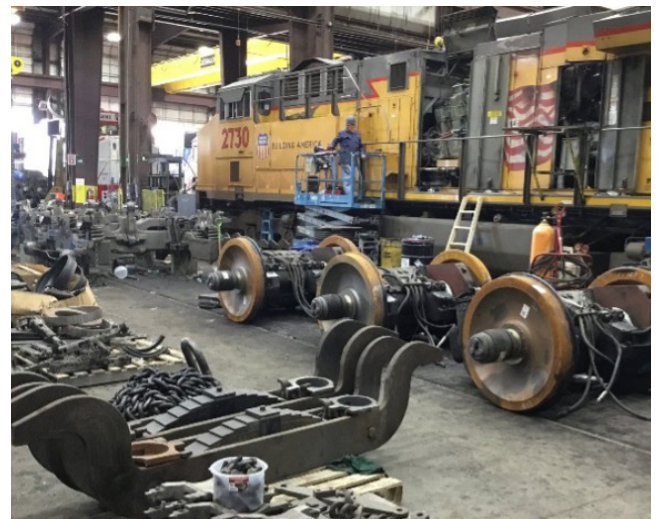
However, many operations are often challenged by the high cost of materials and an inconsistent supply chain, making it difficult to plan and stock inventory. Accurate forecasting and planning for the future while avoiding excess and obsolete stock scenarios are imperative to a profitable operation.

Rail transport companies manage parts inventories from central or local service and repair shops. In scenarios where the maintenance work is attended to by third-party service providers, parts and materials may be provided by either entity.

IFS Cloud EAM includes service parts management capabilities that help coordinate spare parts alongside scheduling and replenishment, centralizing the management of parts inventories.

From straightforward warehousing to the provisioning of depots, the system leverages real-time data to show what's been used, what must be ordered, and the current location of all materials within the system.

IFS enables lean inventory levels, ensuring first-time fix rates and enhanced visibility of parts.

IFS Cloud EAM has the strongest maintenance planning, scheduling, and dispatch functionality available today.

Long-term capacity planning is essential for rail transport companies. This is especially relevant for ongoing inventory and parts management. The IFS what-if scenario explorer (WISE) scopes and explores different options, providing highly accurate predictions to help inform critical business decisions.

Asset Data

The industry has experienced long-standing challenges in adopting digital technologies due to limited data availability, poor data quality, and a lack of standardization across systems and geographies that are not aligned or connected.

Even today, it is not uncommon for some rail transport companies to continue to rely on archaic data capture systems such as hardcopy notes and Excel spreadsheets. However, as IT systems modernize, data types become more varied and dynamic, expanding to incorporate different sources such as IoT data, images, video, voice recordings, and others.

Digitalization initiatives ensure data continuity across the operation. For example, a worker records a video of a malfunctioning cooling system as a part of the diagnostic workflow and to support a warranty claim. Once completed, the worker compiles their findings, storing their report with the video. This straightforward workflow is very complicated if the underlying systems don't support a full range of data formats.

"

Rail operators can combat rising costs by leveraging their existing data for maintenance planning and execution or by adopting advanced technologies to produce new data sources."

Boston Consulting Group

A Digital Approach to Rolling Stock Maintenance, November 2023

BCG

Real-time data

High-quality data enables real-time asset health monitoring to help inform planned maintenance and repair work as well as parts inventory management.

IFS manages the data across the entire lifecycle of an asset. Data moves to the back office, seamlessly integrating with enterprise systems such as ERP, CRM, etc. IFS EAM automatically updates these systems based on all service activities, providing real-time information for invoicing, parts management and inventories, scheduling, and warranties.

Employees access historical and current information about assets and equipment on their mobile devices so they are fully informed. Once the work is complete, job details flow to back office systems to ensure all records are updated.

> "
> The engineer gets everything they need, including the work package on the mobile device. They do the job and report completion, which is fed back through IFS. One human touch only—the engineer."

Mike Gosling, Manager Cubic

Historical data

IFS Cloud EAM provides fleet and asset management capabilities that track changes throughout the history of a component or vehicle. In particular, the tracking of repairs, variations in status, component swaps, and other changes. Workers easily access historical data combined with support information from adjacent enterprise and back-office systems.

Employees and third-party service providers tap into rich data stores, including previous work orders, failures, repairs, and other historical information. This deeper perspective makes it easier to identify recurring issues and trends, helping to inform the diagnosis and recommended course of action.

For example, with wheel management, key measurements must be recorded for each component (diameters, wear, etc.). These data help the company track the condition of the wheel while helping to match wheel-pair for wagons and locomotives.

CUBIC

The workforce

Rail companies depend upon a range of people, such as yard workers, welders, engineers, and other specialists, to report anomalies and perform diagnostics, maintenance, and repairs. Some jobs require certification, degrees, and proficiency in adhering to strict regulatory guidelines and oversight. It's not uncommon for workers to require additional clearances to access sensitive areas and systems while carrying out the work.

Along with repairing and maintaining systems and equipment, workers must calibrate, test, and validate that components are back in working order to satisfy existing service contracts, SLAs, and regulatory or other requirements. For example, if the company supports ISO 55001 (asset management and management systems) standards.

These experienced individuals are challenging to source, especially amid a global skills shortage, so optimizing the productivity of existing specialists is paramount to the success of the business.

Here's how IFS helps:

- **Administrative efficiencies**

- **Workforce oversight**

- **Empowering workers with mobile devices**

Administrative efficiencies

Using the comprehensive IFS platform, workers avoid repetitive and time-consuming administrative work. Instead of a human, the technology automates and manages these processes.

Some examples include authorizations, warranty check logic and chargebacks, service terms confirmation, coordination of service technicians, shipping, repair and return workflows, parts management, etc.

By offloading these administrative tasks, the team can focus on higher-value work, such as the hands-on maintenance or repair of rolling stock systems and equipment.

Associated data and outcomes are retained and integrated within all relevant back-end systems, including asset history, updated parts inventories, technician time management, and other details. With IFS, the business is always up to date.

Workforce oversight

With many industries challenged by the global skills shortage, rail transport companies face an even steeper curve. Reliant upon specialists and engineers with specific qualifications and clearances, the skilled labor hiring pool is not very deep. This scarcity places a greater emphasis on training and rapidly onboarding newly acquired talent.

IFS streamlines the integration of new and qualified personnel, providing a consolidated overview of all employees. Information (capabilities, cost, experience, skills, certifications, degrees, clearances, etc.) is maintained in the IFS system to help drive the scheduling process, considering all available resources and constraints. The system makes finding a technician to perform the necessary repairs easy.

Permissions are set by administrators, enabling all workers in the field to easily access the IFS system for any historical and knowledge-based information they may need, which is especially helpful for new hires. With all the data at their fingertips and automated workflows, worker productivity increases substantially.

Empowering workers with mobile devices

The IFS mobile app connects technicians with back-end systems to access and share real-time data and other records. For example, photographs and videos may be taken to record the diagnosis or any malfunctioning parts to support a warranty claim. These records also prove the installation or repair was carried out successfully and on time.

The IFS mobile app maintains a connection with workers so their activities are accurately tracked and recorded, reconnecting and uploading to back-end systems as soon as a connection is reestablished.

The IFS mobile app is highly configurable and extensible to correctly record verifications, inspections, and other activities during the event. The platform works on offline and online iOS, Android, and Windows devices to support every potential use case and IT environment.

Summary

IFS Cloud EAM, powered by AI, delivers mission-critical asset management for rail transport companies, allowing organizations to manage, service, and maintain rolling stock assets safely and cost-effectively. With asset and other data fully enabled, corporate and regulatory compliance is assured.

Visit our website or contact us for more information.

About IFS

IFS develops and delivers cloud enterprise software for companies around the world who manufacture and distribute goods, build and maintain assets, and manage service-focused operations. Within our single platform, our industry specific products are innately connected to a single data model and use embedded digital innovation so that our customers can be their best when it really matters to their customers – at the Moment of Service™.

The industry expertise of our people and of our growing ecosystem, together with a commitment to deliver value at every single step, has made IFS a recognized leader and the most recommended supplier in our sector. Our global team of over 5,500 employees every day live our values of agility, trustworthiness and collaboration in how we support thousands of customers.

Learn more about how our enterprise software solutions can help your business today at ifs.com.

#MomentOfService