



DIGITAL A CHALLENGE TO BOOST THE RAILWAY VALUE CHAIN

The Ethio-Djibouti Railway Perspective And Experience



INTRODUCTION

In this section we will introduce EDR and its success stories



About EDR

The Ethio-Djibouti Railway, spanning over 750 kilometers, connects Ethiopia's capital, Addis Ababa, to the Port of Djibouti

Ethio-Djibouti Railway Share Company is a joint venture between the governments of Ethiopia and Djibouti that operates and maintains the Addis Ababa-Djibouti Standard Gauge Railway Line

The railway line connects Ethiopia's capital Addis Ababa with the Port of Djibouti, with 45 stations along the 753 km route

ETHIO-DJIBOUTI RAILWAY SCHEMATIC DIAGRAM



Services

Passenger service

150,000 passengers transported annually

Freight service

- Container service
- Bulk cargo service
- Steel transportation
- BCC
- Cold cargo
- Automobile transportation
- Special cargo

Vision, Mission, & Values



Vision

To become the leading railway transporter in East Africa by 2025



Mission

By Operating and maintaining the Ethio-Djibouti Railway to provide seamless, reliable, and dependable Freight and Passenger Transport services between Stations in Ethiopia and Ports of Djibouti



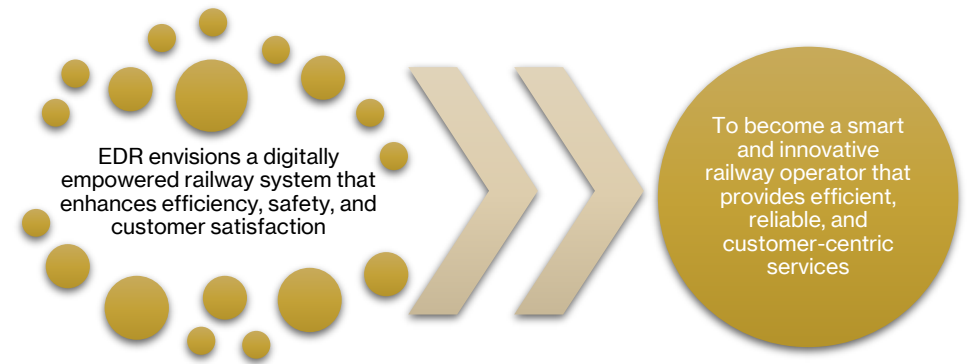
Values

Honesty
Hard work
Efficiency
Customer oriented
Teamwork





Our Digital Vision



Success stories of EDR



Modernizing	Modernizing an old meter-gauge line with a new electrified standard gauge line that reduces travel time increases capacity reduces energy consumption reduces carbon emission etc
Providing	Providing passenger services that strengthen people-to-people relations between Ethiopia and Djibouti transporting over 155000 passengers in one year
Offering	Offering training programs for employees on various aspects of railway operation management maintenance safety customer service etc
Creating	Creating jobs for local people employing 2891 people of which 2431 are Ethiopians and 460 are Djiboutians
Playing	Playing a significant role in enhancing regional integration in the Horn of Africa by facilitating trade movement tourism et



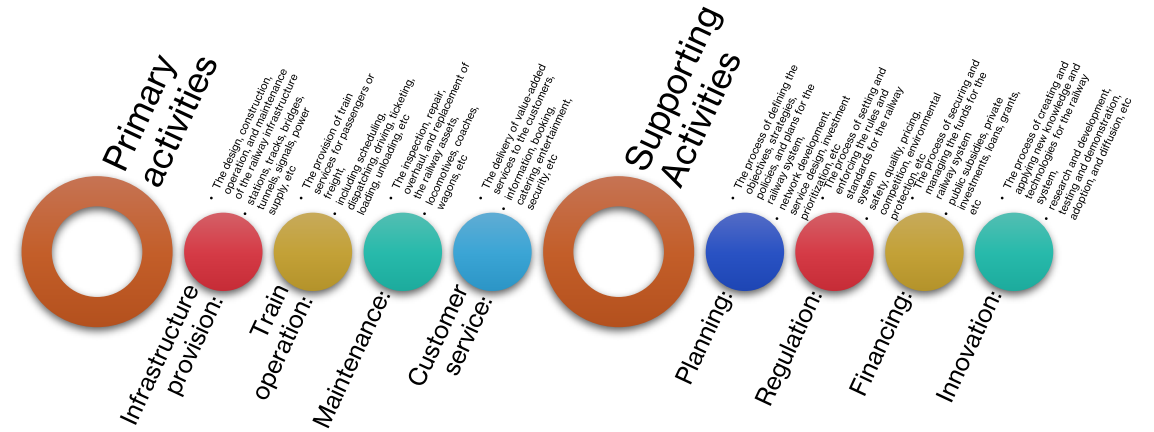
DIGITALIZATION AND THE RAILWAY VALUE CHAIN

EDR'S DIGITAL
TRANSFORMATION
STRATEGY

DIGITALIZATION AND
THE RAILWAY VALUE
CHAIN



The railway value chain – activities



The Railway Value Chain – challenges



Legacy Systems:

Outdated infrastructure and manual processes hinder seamless operations

Aging signaling systems lead to delays and safety concerns

Manual ticketing processes result in inefficiencies

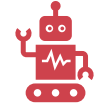


Data Silos:

Information fragmentation across departments affects decision-making

Implementing an integrated data management system

Enabling real-time data sharing between operations, maintenance, and customer service



Safety Concerns:

Ensuring passenger and cargo safety remains a top priority

IoT-Enabled Track Monitoring: Sensors detect track anomalies, preventing accidents

Emergency Response Protocols: Digital alerts and coordinated responses during incidents

Cybersecurity Measures: Protecting critical railway systems from cyber threats



The railway value chain - Digitalization

Improving

Improving the performance and reliability of the infrastructure and assets through smart monitoring, predictive maintenance, remote control etc

Enhancing

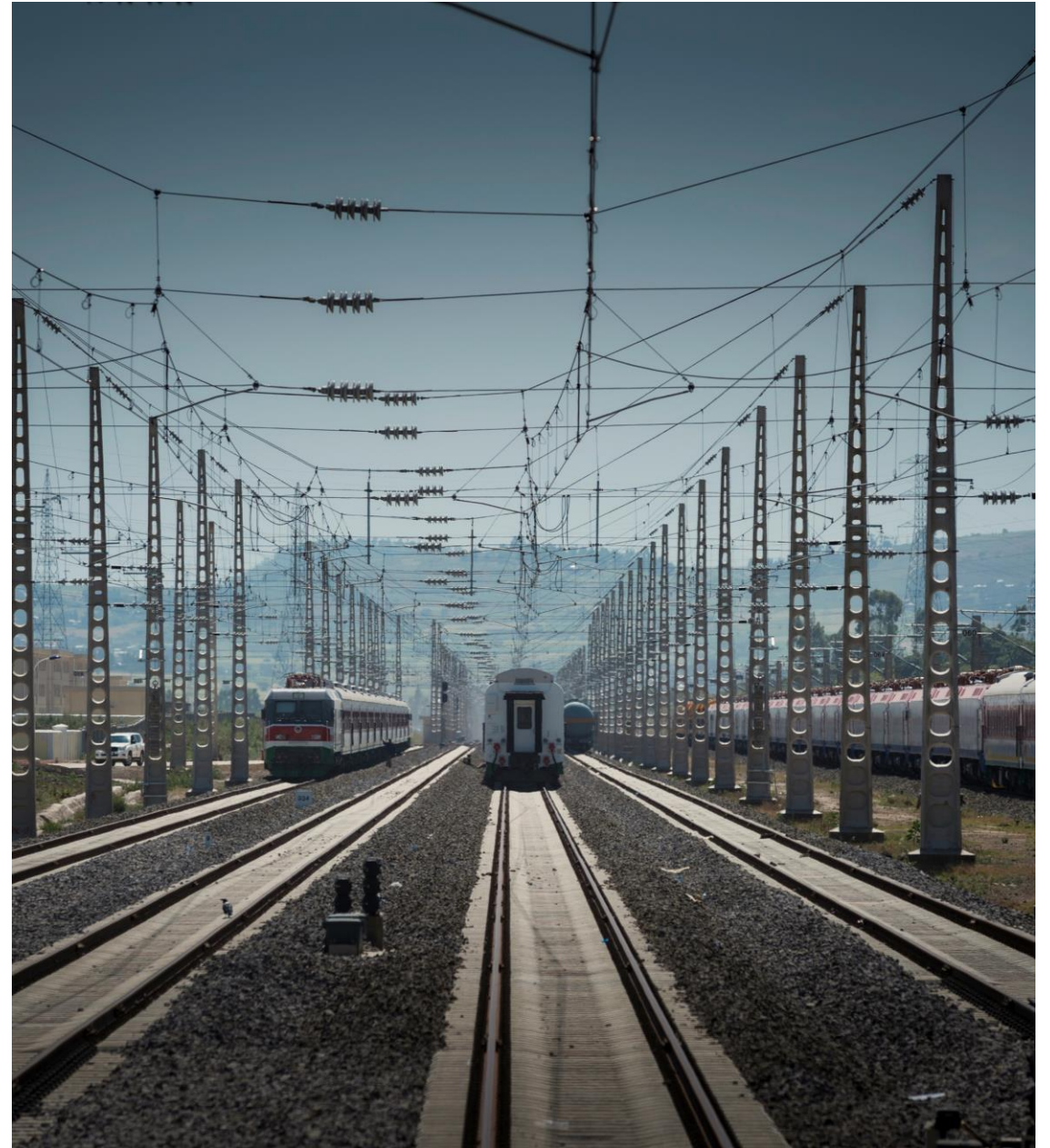
Enhancing the efficiency and safety of the train operation through intelligent scheduling automated driving advanced signaling etc

Increasing

Increasing customer satisfaction and loyalty through personalized information, seamless booking online services etc

Enabling

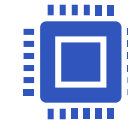
Enabling new business models and revenue streams through data-driven insights, value-added services platform integration etc



Digitalization initiatives in Africa



Analysis of traffic data for the automatic proposal of optimal transport plans



Artificial intelligence and internet of things to improve safety train monitoring predictive maintenance and asset management



Digital training for skills development in the railway professions



Smart monitoring, remote control, intelligent scheduling, automated driving, advanced signaling, personalized information, seamless booking online services, data-driven insights value-added services platform integration etc

Digitalization initiatives in Africa



EDR believes that digitalization is a key driver to boost the railway value chain and create new opportunities for growth and innovation.



EDR is committed to sharing its experience and best practices with other African railways and to collaborating with UIC and other partners to advance the digital transformation of the railway sector in Africa.





DIGITALIZATION AND THE RAILWAY VALUE CHAIN

EDR's Digital Transformation strategy

EDR'S DIGITAL TRANSFORMATION STRATEGY – overview

Digital transformation in the Ethio-Djibouti Railway Share Company is the process of leveraging digital technologies to improve the operations, performance, and services of EDR

Implementing digital platforms and solutions that can optimize the operational processes and enhance the customer experience, such as enterprise resource planning, customer relationship management, call center, website, web portal, ticketing system, and mobile app

Providing a safe and secure service, such as by implementing cyber security measures, data protection policies, and emergency response systems

Adopting ERTMS or upgrading CTC to improve safety, capacity, reliability, and interoperability of the rail network, and enable automated train operation, which can further enhance efficiency and performance





EDR'S DIGITAL TRANSFORMATION STRATEGY – the customer centric journey

Strategy

- To improve its operational efficiency, customer satisfaction, safety and security, and environmental sustainability.

Vision:

- To become a smart and innovative railway operator that provides efficient, reliable, and customer-centric services

Objective

- To improve customer satisfaction, loyalty, and retention by delivering personalized, convenient, and seamless customer experiences across multiple channels and touchpoints
- To increase operational efficiency, productivity, and performance by automating, optimizing, and streamlining business workflows and processes
- To foster innovation, development, and growth by enabling data-driven decision making, learning and experimentation
- To enhance security, resilience, and compliance by protecting data, assets and transactions from cyber threats and risks

EDR'S DIGITAL TRANSFORMATION STRATEGY – Pillars



Pillars of the strategy

Digital infrastructure

To build and upgrade the physical and technological infrastructure that supports the railway operations and services

Digital Customer Experience

to provide a seamless and convenient customer journey for its passengers and freight customers.

Digital operation Excellence

to optimize its operational performance by leveraging data-driven insights and automation.

Digital business innovation

to create new business opportunities and revenue streams by adopting innovative digital solutions

Digital skills

building and strengthening the digital skills and competencies of the railway staff at all levels and functions to effectively use, manage and leverage digital technologies and data in their daily work and

Digital Governance

establishing and implementing a clear and coherent digital governance framework that guides and oversees the digital transformation process

Digital sustainability leadership

to minimize its environmental impact and promote green growth by implementing digital environmental management solutions.



EDR'S DIGITAL TRANSFORMATION STRATEGY – initiatives



The customer centric journey

Enhancing the customer experience, satisfaction, and loyalty through digital platforms and channels



Research through data analytics

leveraging data to generate insights, improve decision making, and optimize performance



Service and support

ensuring the availability, reliability, and security of ICT services and solutions



Cyber security

protecting the ICT assets, data, and systems from cyber threats and risks



ICT work force

developing the skills, competencies, and capabilities of the ICT staff and fostering a culture of innovation and collaboration



EDR'S DIGITAL TRANSFORMATION STRATEGY – Benefits

Efficiency:

- Reduced delays, optimized routes, and improved resource allocation.

Cost Savings:

- Lower maintenance costs, fuel efficiency, and streamlined operations.

Data-Driven Decision-Making:

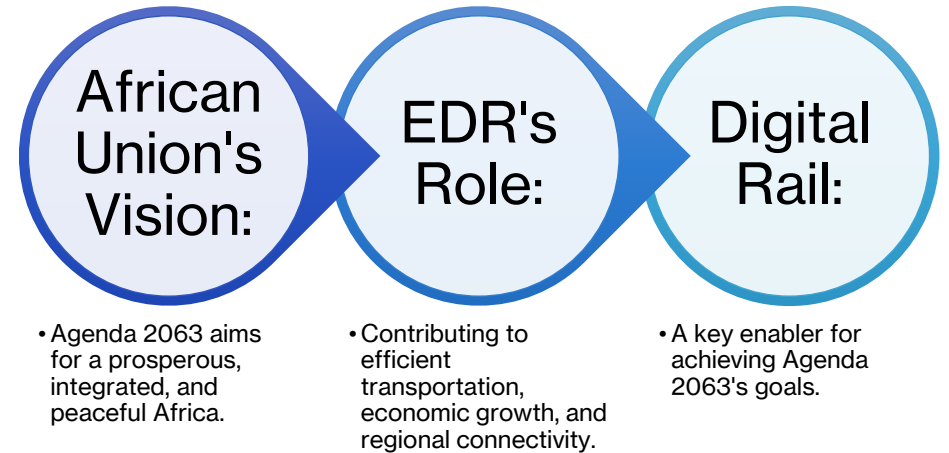
- Evidence-based choices for strategic planning.

Enhanced Safety:

- Real-time monitoring and predictive analytics enhance safety protocols.



EDR'S DIGITAL TRANSFORMATION STRATEGY – agenda 2063 alignment



EDR'S DIGITAL TRANSFORMATION STRATEGY – Roadmap

- Implement a ticketing system that allows online booking, payment, and verification

Stage 1:
2024:



- Implement an enterprise resource planning system, a customer relationship management system, and a call center system

Stage 2:
2025:



- Implement a railway infrastructure security system that includes CCTV cameras, access control, and alarm systems

Stage 3:
2026:



- Implement a smart railway system that uses sensors, IoT, AI, and big data to monitor and control the railway operations and maintenance

Stage 4:
2027:



- Sustainability and continuous upgrading

Stage 5:



EDR'S DIGITAL TRANSFORMATION STRATEGY - challenges

Lack of adequate infrastructure:

- EDR operates in a region that lacks adequate infrastructure for digital connectivity, such as broadband internet access, mobile network coverage, and reliable power supply

Lack of skilled workforce:

- EDR requires a skilled workforce that can design, implement, operate, and maintain its digital systems

Lack of regulatory framework:

- EDR operates in a regulatory environment that is not fully aligned with its digital transformation objectives

Lack of stakeholder coordination:

- EDR interacts with various stakeholders in its digital transformation journey
- customers , suppliers , partners , regulators , etc



EDR'S DIGITAL TRANSFORMATION STRATEGY – Prospects and Opportunities

Expansion Plans:

EDR aims to extend its network, connecting more cities and neighboring countries.

Innovation Hub:

Establishing an innovation center for rail technology research.

Green Rail:

Exploring eco-friendly solutions for sustainable rail transport.

Leveraging the Belt and Road Initiative (BRI):

EDR is part of the BRI, a global development strategy initiated by China that aims to enhance connectivity and cooperation among countries through infrastructure, trade, and investment.

EDR can leverage the BRI to access financial, technical, and strategic support from China and other BRI partners for its digital transformation.

Expanding the regional integration (RI):

EDR is a key component of the regional integration agenda of the African Union (AU) and the Intergovernmental Authority on Development (IGAD) that aims to promote economic, social, and political integration among African countries.

EDR can expand its regional integration by connecting with other railway networks in the continent, such as the East African Railway Master Plan (EARMP) and the Trans-African Railway Network (TARN).

Adopting the best practices (BP):

EDR can adopt the best practices from other railway operators that have successfully implemented digital transformation,

such as the European Rail Traffic Management System (ERTMS), the Indian Railways (IR), and the China Railway Corporation (CRC). EDR can learn from their experiences, challenges, and solutions, and adapt them to its own context.



DIGITALIZATION AND THE RAILWAY VALUE CHAIN

Role and impact of digitalization for sustainability of the African rail industry



Role and impact of digitalization for sustainability of the African rail industry

- Digitalization for sustainability of African railways is aligned with the African Union's Agenda 2063: The African Union has adopted "Agenda 2063" as a strategic framework for the socio-economic transformation of the continent over the next 50 years
- Digitalization for sustainability of African railways can address the challenges and opportunities of the railway sector in Africa: The railway sector in Africa faces various challenges such as low network coverage, poor infrastructure quality, outdated technology, low operational efficiency, high operational costs, low customer satisfaction, low safety and security standards, and high environmental impact

Role and impact of digitalization for sustainability of the African rail industry

- Digitalization can help seize these opportunities by creating new services and products for customers, such as e-commerce, logistics, tourism, etc.; exploring new markets and partnerships, such as regional integration, Belt and Road Initiative, etc.; and adopting best practices from other railway operators, such as European Rail Traffic Management System , Indian Railways , China Railway Corporation , etc
- Digitalization for sustainability of African railways can contribute to the Sustainable Development Goals : The United Nations has adopted the 2030 Agenda for Sustainable Development, which consists of 17 goals and 169 targets that aim to end poverty, protect the planet, and ensure peace and prosperity for all





Call to action

Coordination Framework

- Strengthening coordination among various stakeholders, including government agencies, railway operators, and technology providers, is essential

Policy Alignment and Regulation

- Aligning policies and regulations across different countries and regions within Africa is challenging
- Regulatory frameworks need to adapt to accommodate digital innovations while ensuring safety and security

Investment Scaling-Up

- Digital transformation requires significant investment in technology infrastructure, skilled personnel, and capacity building
- Funding mechanisms, public-private partnerships, and international cooperation are vital for financing digital initiatives



Call to action

Human Capacity Development

- Building a skilled workforce capable of managing digital systems is critical
- Balancing traditional railway expertise with digital skills is a challenge

Legacy Systems Integration

- Many African railways still rely on legacy systems, which may not be compatible with modern digital solutions
- Retrofitting or replacing legacy systems without disrupting operations requires careful planning

Infrastructure Constraints

- Limited access to reliable power, internet connectivity, and communication networks affects the implementation of digital solutions
- Upgrading infrastructure to support digitalization is a priority



Call to action

Data Security and Privacy

- Protecting sensitive data, preventing cyber threats, and ensuring passenger privacy are critical
- Data breaches can have severe consequences for railway operations and passenger trust

Interoperability and Standardization

- Ensuring that different digital systems can communicate seamlessly is challenging
- Interoperability enables efficient collaboration between railways and other transport modes

Cultural Change and Adoption

- Shifting from traditional practices to digital processes requires a cultural change
- Promoting a digital mindset and fostering innovation are essential



Call to action

Environmental Considerations

- Balancing digitalization with environmental sustainability is crucial
- Green rail technologies should be integrated into digital strategies



Strategy for areas of collaboration

Knowledge Sharing and Best Practices

- Establish platforms for sharing experiences, case studies, and successful digital initiatives
- Encourage railways to learn from each other's successes and failures

Joint Research and Development

- Collaborate on research projects related to digital technologies
- Focus on areas such as predictive maintenance, cybersecurity, and data analytics

Standardization and Interoperability

- Work together to define common standards for data exchange, communication protocols, and interfaces
- Ensure that digital systems across different railways can seamlessly interact



Strategy for areas of collaboration

Public-Private Partnerships

- Engage with private technology companies, startups, and investors
- PPPs can provide funding, expertise, and access to cutting-edge technologies

Capacity Building and Training

- Collaborate on training programs for railway staff
- Leverage universities and research institutions for specialized training

Regional Integration and Cross-Border Projects

- Identify cross-border digital projects that benefit multiple countries
- Harmonize regulations and policies to facilitate seamless operations across borders



Strategy for areas of collaboration

Leverage Existing Regional Organizations

- Organizations like the African Union Commission and regional economic communities can play a coordinating role
- Encourage railways to actively participate in regional initiatives

Innovation Hubs and Sandboxes

- Establish innovation hubs where railways can collaborate with startups, tech companies, and academia
- Create sandboxes for testing and piloting digital solutions in a controlled environment

Advocacy and Policy Influence

- Collaborate to advocate for favorable policies and regulatory frameworks
- Jointly address barriers related to data privacy, spectrum allocation, and cybersecurity

Shared Infrastructure and Data Centers

- Explore shared data centers for hosting digital platforms
- Collaborate on cloud-based solutions for scalability and flexibility



Collaboration is not just about technology—it's about fostering a culture of cooperation, trust, and shared goals. By working together, African railways can accelerate their digital transformation journey and create a connected, efficient rail network for the continent

Strategy for areas of collaboration

Conclusion

- Knowledge Sharing and Best Practices
 - EDR can share its experiences, lessons learned, and successful digital initiatives with other African railways
 - Collaborative workshops and forums can facilitate knowledge exchange
- Regional Integration and Connectivity
 - As a cross-border railway connecting Ethiopia and Djibouti, EDR can promote regional integration
 - It serves as a model for other railways seeking to enhance connectivity across national boundaries
- Technology Adoption and Innovation
 - EDR can actively adopt and implement digital technologies such as IoT sensors, real-time monitoring, and predictive maintenance
 - By embracing innovation, EDR can inspire other railways to explore similar solutions



Conclusion

- Capacity Building and Training
 - EDR can collaborate with universities and research institutions to develop training programs
 - Joint capacity-building initiatives can create a skilled workforce capable of managing digital systems
- Advocacy and Policy Influence
 - EDR, along with other African railways, can advocate for favorable policies and regulations related to digitalization
 - By influencing policymakers, EDR can create an enabling environment for digital initiatives
- Collaboration with Private Sector
 - EDR can partner with private technology companies, startups, and investors
 - Public-private partnerships can provide funding and expertise



Conclusion

- Data Sharing and Interoperability
 - EDR can champion data sharing and interoperability standards
 - Common protocols and interfaces benefit the entire sector
- Showcasing Success Stories
 - EDR can share its success stories in digital transformation
 - Case studies and presentations at industry events can inspire others
- Environmental Considerations
 - EDR can explore eco-friendly digital solutions
 - By prioritizing environmental impact, EDR sets an example for responsible digitalization



Conclusion

- Participation in Regional Initiatives
 - EDR can actively engage in regional railway associations, conferences, and working groups
 - Collaborating with other railways on joint projects fosters a sense of community and shared purpose



Conclusion

- EDR's proactive approach to digitalization can serve as a catalyst for positive change across the African railway sector. By leading by example and collaborating with others, EDR contributes to a more connected, efficient, and technologically advanced rail network in Africa





Thank you

Let's embrace digital transformation together!