

Digitalisation as top priority for the rail sector and its future

Currently Europe is not at the forefront of the digital revolution – in fact Europe is lagging behind. But it's not too late; we have to act faster in order to participate in the so called 4th industrial revolution. The megatrend – Digitalisation – has an impact on everybody and is disrupting the industry innovatively. We are facing new possibilities such as the spectacular increase in productivity, as well as huge challenges like the impact on employment and work.

Digitalisation is one of the top priorities for the rail industry and its future. The objective for railways is to offer highly efficient and attractive transport options to their customers and to make the most of the opportunities offered by digital transformation.

In the last decades, the IT development and the increased use of digital technology have deeply transformed the way railways work today and now deeply influence our economy and the expectations of our customers. As a result of its competitive environment, the railway industry has to be committed to innovation. It is crucial to adapt quickly to a fast-moving technology environment and to act on new trends in order to foster attractiveness and competitiveness.

As an industry, rail companies are exploring opportunities, and adapting to and integrating new digital ecosystems in order to maintain their strong economic positions in Europe. This also requires a more joint-venture work in a co-creation model to develop an innovative mind-set centered on the customer in order to enhance their ability to integrate rail travel into their experience. This should be in cooperation with customers on one hand and with third parties on the other hand.

In addition, we should support the focus of the European Commission on digitalisation as one of its political priorities. Therefore we should be willing to contribute towards the creation of a European Digital Single Market and we would thereby propose some further ideas:

- offering connected railways – provide reliable connectivity for safe, efficient and attractive railways
- enhancing customer experience - offer better and added value for customers
- increasing capacity - enhance capacity and performance of railways
- boosting competitiveness – making the most of transport data

Reliable and better connectivity will provide safe, efficient and attractive railways both for customers and operators.

Connectivity must be viewed as a foundation base technology allowing the full realisation of the European Single Digital Market and digitalisation of railways. The aim is to increase the access to the Internet and to provide connectivity across the entire rail network and on all the different railway lines.

Digitalisation of railways will enhance customer experience by offering a better and added value and meeting their expectations.

Thanks to digitalisation, railways should become an environment in which customers live a fulfilling experience before, during and after the travel.

The digital tools need to address individual requirements by creating a **door-to-door solution** and additional value for the customer travel experience. They need to be designed in such a way that they are secure, safe, reliable, and totally at the disposal of the customers.

Railways are increasingly offering **on-board Internet and entertainment services** in order to respond to the rising demand from customers. Rail passengers often choose rail travel over other transport modes due to their ability to access the Internet in order to use their mobile devices for leisure and work purposes. This represents not only a key competitive asset for railways, but also increases customers' experience and satisfaction that Internet is consistently available throughout the rail network.

Better collaboration within the industry and beyond such as sharing good practices and lessons learned, building win-win partnerships, e.g. with start-ups, app developers or technology providers, and using the added value will together offer better solutions for passengers, freight users and their own staff.

The use of Internet of things as well as the implementation of automatic train operations will increase the capacity and performance of railways.

The Internet of things, a network of physical objects able to connect with each other and exchange data, will help to increase productivity and effectiveness of operational processes. The challenge will be to implement new sensors on existing equipment, and to create, collect and then make the best use of data in an efficient way while ensuring security and privacy of data.

In addition to sensors, wearables and artificial intelligence will also be increasingly deployed to meet the specific demands of railways, their staff and customers. This area represents a huge opportunity for further transformation of railways. The increased deployment of different tools improves the quality of services and safety, optimises costs, manages time better, enhances network supervision and improves energy consumption. It will also move towards predictive maintenance and equipment monitoring.

Furthermore, the implementation of **automatic train operations (ATOs)** has proved to enhance the network capacity, ensure operational effectiveness and efficiency, improve punctuality, save energy, lead to financial savings and improve safety. ATOs have improved the overall quality of rail services. Further projects are therefore planned all over the world in order to introduce the concept in a short and medium term.

The exploitation of transport data will boost the competitiveness of digital railways.

The development of new IT technologies has facilitated the collection and exploitation of transport data. Maximising the use of data will lead to economic growth, innovation and significant benefits for the rail industry, their customers and the European economy, creating and developing interoperable and interconnected services. The different aspects of opening up data and data sharing need to be better explored in order to create clear added-value for the rail industry and the society.

The ongoing fourth industrial revolution is radically modifying the global economy, and particularly manufacturing and industry-related jobs & services. Europe needs a **true digital transformation** to regain global competitiveness and deliver growth and jobs.

Additionally, Europe needs an overarching shift to become the most dynamic digital growth region in the world, taking into account the digital economy's global nature and business integration in global value chains. This requires more global convergence and harmonization of rules and standards. It means accompanying change, avoiding the primary focus on possible risks and shifting the approach to regulation.

This can be especially achieved through:

- A comprehensive and coordinated strategy, avoiding fragmentation while looking at national best practices and encouraging the creation of digital ecosystems across the continent.
- A digital transformation roadmap based on achieving robust and cyber-secure infrastructure, first class manufacturing, supportive and market-relevant standards, interoperability, strong intellectual property and European technological solutions.
- Providing guidance to all companies and support to embracing digitalisation, reversing inadequate trends in technology and innovation investment. This can be achieved through raising awareness, encouraging financing and supporting R&D.
- Adopting an innovation-friendly approach to data to empower the digitalisation process and offer robust solutions to smart and big data applications throughout value chains. This also requires also a balanced approach to the issue of access for third parties to non-human, machine-generated data.
- An assessment on how best to adapt labour markets and work organization in order to derive maximum benefits of the digital transformation for business and workers. Adaptation by employees to increase work flexibility and the skills required is essential.
- Understanding the challenges of digital transformation and encoding digitalisation in EU policy and in the European economic DNA in order to allow businesses and citizens to take advantage of this massive potential.
- Regarding aspects related to railways and logistics, we should focus on networks and should take different sectors and their relations to digital infrastructure into account, for instance e-retailers and delivery services. The degree to which overall benefits of digitalisation are achieved is dependent on the effective interconnections between these industries and players.
- What has begun with a stronger digital networking between companies and transport methods will develop into fully automatic logistics systems. Production and intra-logistic processes will implicate new requirements for railways and trade logistics.
- Transparency, affordability and reliability have to be the common basis for interaction by all involved. For a multitude of stakeholders ranging from global shipping businesses, national operators to small and local delivery companies, digitalisation drives demand for new products and services. Price transparency, interoperability and access where required by markets and legislation are key. It is commendable that a number of steps are already being taken, for example the new Europe-wide cross-border solutions especially tailored, as a response to market demand driven by digitalisation.

The use of financial instruments, such as, European Structural and Investment Funds (ESI Funds), European Fund for Strategic Investments (EFSI), Horizon 2020 and other EU programmes in the areas of research and innovation, in particular the Connecting Europe Facility and Shift2Rail, should be encouraged and increased. The financial instruments should support and stimulate public and private investment in innovative digital initiatives of railways and provide funding to relevant projects for research and development in areas identified by the industry.

In terms of the impact of digitalisation on jobs and required competencies, **Human Resource Management** is intended to be more proactive in the future. People or rather employees need to be more involved, as without them no digital change and no Working Environment 4.0 is possible at all. Digital transformation in connection with organisational development concerns one major core competence of HR managers. Changing corporate cultures by strengthening agility and accelerating decision-making processes is of high significance. One main key factor to success is self-responsibility of each and every single employee. Consequently, decisions will not be made over a lot of hierarchy levels and results are more visible and forthcoming. This can be reached by self-management training and instructing executives accordingly. Flat hierarchies and communication standards on personal levels encourage employees to bring in their own ideas, strategies and solutions. For example in Silicon Valley “design thinking” or “think big” are the new keywords for employees, as experimenting should be part of employees’ mind-set. To raise this awareness and to increase employees’ level of commitment, HR should play an important role. On the one hand, this decision making strategy emphasizes innovative and active teams. On the other hand, the more pressure on employees, the more important the workplace and working environment. When employees feel comfortable, creativity can be developed. This is why, for instance, so-called feel-good-managers are hired in Silicon Valley. Nonetheless, a functioning work-life-balance needs to be created for employees. This means, in terms of change management processes it is vital for employees to be effectively guided.

Flexibility and mobility are two key words that describe today’s and future working environments. For the rail industry it is inevitable to operate on a 24/7 basis as customers have come to expect services around the clock. Working in shifts and at home as well as flexible working times are common practices. For some employees, especially for those working in offices, it is not always necessary to be physically and temporarily present. Hence virtual meetings video conferences or 3-D-virtual-reality-conferences will take on greater significance. Therefore all technical requirements, such as information and communication media, need to be provided by the employer. Out of these new working methods desk sharing, by way of example, will become very popular.

As a matter of fact, in the near future more appreciation in terms of automatization and IT will be needed. Particularly for older employees confrontation with IT is very challenging, which creates the urgent need for extended vocational training and specific education respectively. However, new jobs within the IT area have risen due to digital transformation, for instance chief digital officers, web designers, social media managers, but especially jobs within the sections cloud computing and Big Data. As a consequence classic IT services, like server maintenance, will probably decline. More investment in Analytics and use of the information offered by Big Data is essential. Cloud computing not only enables the application to be accessed from anywhere with an Internet connection, but makes it also possible to immediately have a link with the rest of the corporate applications. By implementing HR-IT-Tools, various Human Resources processes will be harmonized as well as digitalized. Applications such as Employee Self Services (ESS) and Management Self Services (MSS) will support and simplify Human Resource Management in many different ways. Employees will be able via ESS to enter, change or just display personal data. Initiating, authorizing or even denying HR processes are further features of ESS and MSS and will result in an overall acceleration and simplification.

Obviously, our future is digital in each and every sector. To enable Europe to lead the megatrend Digitalisation we should work on a prospective Human Resource Management. This means there is the need to establish simplified and uncomplicated communication channels, fast and direct information exchanges, flexible and individual working models, optimized working environments to increase efficiency and productivity as well as networked working places. By implementing this, we will be able to face the huge challenges on employment and work.