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Report on the Workshop of the European Network of Railway Clusters ERCI from the perspective of safety in EU rail traffic, Marina di Carrara, Tuscany, 20–22 June 2022 Workshop topic: Strengthening European value chains for industrial companies

With dozens of railway companies from all over Europe, several hundred participants from various enterprises and only one railway cluster from Poland – in Marina di Carrara, Carrara, in Tuscany, the first meeting of the joint task forces “Cybersecurity on railways” and “Multimodal logistics” operating within the European Railway Clusters Initiative (ERCI) took place.

The ERCI is a leading meta-cluster of the railway industry in Europe, bringing together 16 innovative clusters from 17 European countries (Italy, Poland, France, Great Britain, Spain, Turkey, Denmark, Belgium, Sweden, Croatia, Slovenia, Serbia, Bosnia and Herzegovina, Montenegro, North Macedonia, Austria, Germany). Together, it combines the ideas and interests of over 2,000 small and medium-sized companies in the industry.

Among the founding members of the ERCI, apart from the clusters from Germany, France and Italy, there is one Polish cluster – OTTIMA plus Ltd. / Southern Railway Cluster. The meeting on behalf of the Polish cluster was attended by Associate Professor PhD Adam Jabłoński (President of the Management Board) and Associate Professor PhD Marek Jabłoński (Vice President of the Management Board).

The meeting in Tuscany was combined with a workshop under the slogan: “The Blockchain Made Easy for SMEs and European Value Chains”.

Blockchain is an innovative database concept that is not stored on a central server but is a network of equivalent replicas. Each of them may be owned by all interested system participants.

The meeting created access to the knowledge and technology transfer of European partners in the railway industry, which was a breakthrough in the constantly developing railway market in Europe. This is the first event of its kind to address a “very hot” topic in recent times: Blockchain technology, which is an extremely important driver of innovation. Companies from various parts of Europe talked about how the use of blockchain technology looks in practice.

Blockchain as a key technology for the European railway sector

As noted during the workshop in Italy – Blockchain is and will be a key technology for the railway sector as it introduces a new approach to data-based processes. This unlocks a very wide and varied application potential, with benefits in terms of performance, safety, security, sustainability and railroad operations.

It therefore becomes fundamental to fully understand the technology that can implement benefits for any organisation. For this purpose, during the three-day workshop, more than 20 speeches by representatives from clusters and railway companies from all over Europe were given.

The event was opened by the ERCI Management Board – Veronica Elena Bocci (DITECFER, Italy) and Dirk-Ulrich Krüger (Rail S., Germany), who, after a short introduction, announced the first speaker, Giorgio Pizzi (Ministry of Sustainable Infrastructure and Transport / ENISA TRANSSEC – Italy). During his speech, “Cybersecurity in Railways: What has been achieved? What remains to be done?” he emphasised in particular that rail networks are part of public transport systems, which

are in turn a complex and closely interconnected network. Giorgio Pizzi noted that such a configuration could give an attacker the opportunity to launch a coordinated attack, undermining the stability of society and the economy. The consequences of these attacks on such critical infrastructures can spread from one system to another, causing disruption.

Presentation by Prof. Filippo Zatti (University of Florence) turned out to be extremely interesting – the author presented blockchain technology as a kind of open, distributed digital ledger that can efficiently and quickly record transactions between parties. Blockchain technology is based on a common IT platform focused on distributed data storage using an algorithm. Encrypted data ensures transmission security and limited access for third parties.

The following topics were discussed in subsequent speeches:

- “Railway freight and multimodal logistics: How to tackle gaps from a value chain perspective – Ignasi Gómez-Belinchón (In-Move by Railgrup – Spain), Aristarco Tomás (Tenalach Consulting – Spain),
- “Building EU leadership in blockchain technology: The European Commission’s blockchain strategy – Q&A” – Pierre Marro (European Commission – DG CNECT – Belgium),
- “Discovering blockchain technology: the fundamentals – Q&A”, Prof. Filippo Zatti (University of Florence – BABEL – Italy),
- “Blockchain-enabled virtual coupling of automatic train operation” – M. Ganesan (Alstom – India),
- “Digital automatic coupling of rolling stock in a freight train and the enabling role of blockchain” – Francesco Lucisano (Co.El.Da. Software – Italy), Guido Ancarani (DITECFER – Italy),
- “Exchange of information in TEN-T Logistics Corridors: I Rail Project and eFTI platforms perspectives” – Marco Mattiocco (Excise, Customs and Monopoles Agency – Italy),
- “Blockchain-enabled ports: the experience of the “PLANET” H2020 project and blockchain interoperability” – Harris Niavis (Inlecom – Belgium), Claudio Salvadori (NGS – New Generation Sensors – Italy),
- “What skills for blockchain: the “CHAISE” blueprint alliance of the EU and training available” – Pietro Azzara (Italia 4 Blockchain – Italy),
- “The STARS blockchain network: How we got here and what our goals are” – Conversation between Veronica Elena Bocci (DITECFER / STARS project – Italy) and Fabio Gatti (Apuana SB / STARS project – Italy).

The first day of the workshop ended with “roundtable” talks on open points about blockchain usage and key lessons. The interviews were attended by: Giorgio Pizzi, Luigi Rucher, Pietro Azzara, Federica Montaresi, Thomas Ostertag and Fabio Gatti. Veronica Elena Bocci was the moderator of the conversation.

The second day of the workshop was mainly focused on the search for new blockchain use cases in railway and multimodal logistics. Veronica Elena Bocci made presentations from stakeholders on blockchain use cases in their organisations.

Nicola Gramegna (EnginSoft – Italy) and Martin Holland (Prostep – Germany) presented ways to gain the potential of blockchain technology integration. Annabelle Sion (Polymeris – France) and Maximin Mair (DeconX – Italy) answered questions about the use of blockchain technology to track materials used in production processes, supporting sustainable development.

During the speech entitled “Blockchain for condition monitoring”, John Euston (University of Birmingham – UK) emphasised that remote condition monitoring (RCM) technologies benefit the rail industry by improving its availability, safety and asset reliability. The RCM system enables the detection and diagnosis of failures in damaged assets, preventive maintenance, and the avoidance of breakdowns, costly breakdowns and delays.

In the following speeches, the participants of the meeting from Italy and Spain made their presentations.

- “Blockchain for traceability in logistics – Q&A” – Marcos Icardó (Usyncro – Spain),
- “Untapped potentials from integrating technologies: Blockchain and IoT – DEMO – Q&A” – Leonardo Fabbri (Elfi Electronics – Italy),
- “Untapped potentials from integrating technologies: Blockchain and artificial intelligence; blockchain and digital twin; overview of more possible use cases; funding opportunities – Q&A” – Veronica Elena Bocci, Guido Ancarani (DITECFER – Italy).

Veronica Elena Bocci and Guido Ancarani (DITECFER – Italy) presented how to use the potential of integrated technologies: Blockchain and artificial intelligence. Most possible use cases and funding opportunities have been reviewed.

The next part of the workshop was about practical work with blockchain technology. Fabio Gatti (Apuana SB – Italy) demonstrated how to register a transaction on the STARS blockchain network. Participants representing railway companies and clusters from all over Europe were divided into international groups of several people and together they performed exercises aimed at, among other things, identification of the use cases for blockchain technology and key data, and the benefits resulting from them.

Blockchain is one of the fastest growing technologies. The meeting of the member companies of the European network of ERCI clusters and the solutions presented by them in this area confirm this fact. The workshop helped understanding of the challenges facing this solution. These include, undoubtedly, the issue of improving security. The wide range of potential applications of this technology opens up new possibilities, which, however, must be fully understood in order to be able to fully use them safely.

To sum up, it should be noted that during this important conference, bilateral meetings were held between cluster management boards and their members. On behalf of Poland, Associate Professor PhD Adam Jabłoński, and Associate Professor PhD Marek Jabłoński actively participated in these meetings, especially in terms of comparing the presented solutions in Europe to the solutions operating in Poland. This also concerned the ability to dynamically transfer modern technologies supporting the increase in the level of rail traffic safety to Poland and the analysis of their implementation in the conditions of the operational and investment processes, which are currently very multidimensional in Poland.

