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Report on Information Technology for Seamless Rail-Based Intermodal Transport Services in Northeast and Central Asia

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1. Introduction

Liberalization and integration of international trade, increasingly growing cross-border cooperation speed up economic development of the countries of Asia and the Pacific.

Time and cost of goods transit are among the critical components shaping international trade. Therefore, container transportation by various modes of transport lays a significant role on the main international trade routes on the Eurasian continent. The long-distance railway transport connecting Asia and Europe is the main alternative to deep-sea shipping operations through the Suez Canal. Countries of Northeast and Central Asia largely rely on railway links, including the Trans-Siberian Railway, for their international trade with Europe.

At present, regular container block trains operate to transport goods between China and Europe in both directions[1].

The Trans-Siberian Route is also used for the transportation of goods to Central Asia, other countries of the Commonwealth of Independent States (CIS) and Europe from Japan and the Republic of Korea (see Figure 1).

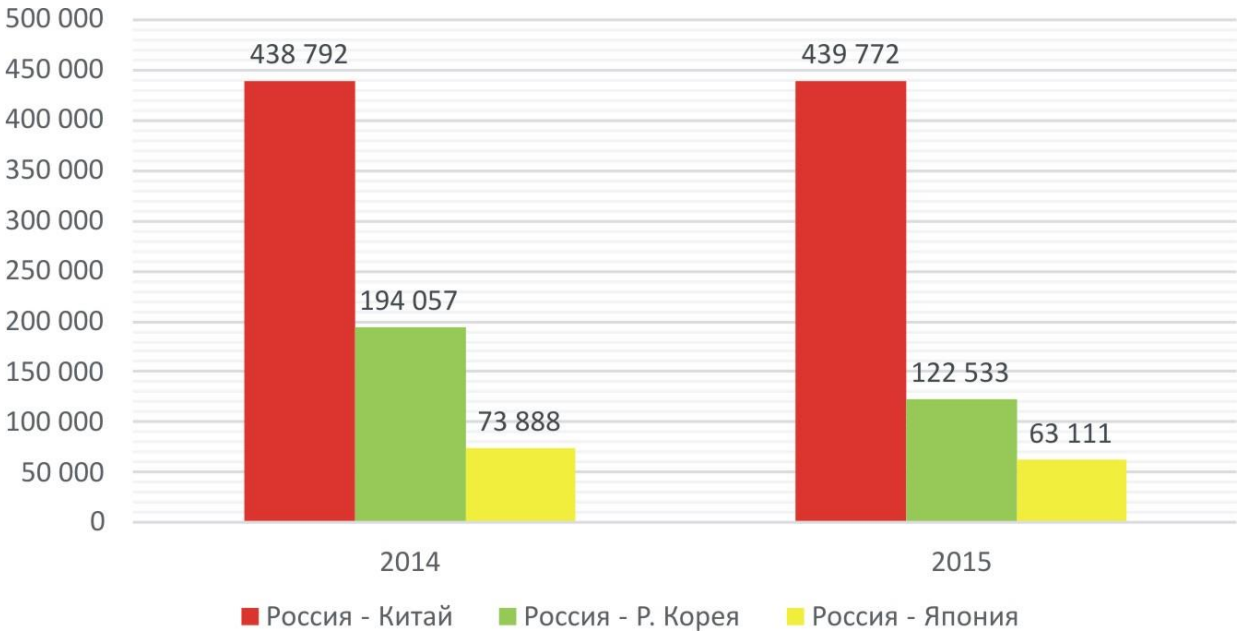

Figure1. Container freight transportation between the Russian Federation and Asia-Pacific countries, 2014 – 2015, TEU

At present, China is the main generator of container flow in Euro-Asian trade with estimated 60% of total container traffic. The main volume of containers is currently transported by sea.

[1]Europe – China routes: Duisburg - Chongqing; Hamburg - Wuhan; Brest, Dobra - Zabaikalsk; Hamburg - Zhengzhou; Madrid - Yiwu; Duisburg - Korla; Lodz - Chensen; Hamburg - Lanzhou;
China - Europe routes: Zhengzhou - Hamburg; Suzhou - Warsaw; Changsha - Duisburg; Changsha - Warsaw; Nakhodka - Dobra, Brest; Wuhan – Dostyk - Pardubice; Kuitun - Tbilisi; Chengdu - Dostyk - Lodz; Chongqing - Dostyk - Duisburg; Yiwu – Madrid; Wuhan - Hamburg; Hefei - Hamburg; Chengdu - Nurnberg.

The container flows by rail in trade with China are primarily directed to the central parts of the country, to a lesser extent to its southern parts to the factories of South China, and to ports for further transit to other countries of Asia and the Pacific.

Given that overall directions of economic development of China are aimed achieving balanced economic development and growth in the western areas of the country, international container flows operated on the Trans-Siberian and other railways are expected to grow in the long run.

Despite this fact, freight traffic is being slowed on the routes passing through the national borders with tough customs control and regulations implying a large number of bureaucratic and technological procedures. According to estimates of the Coordinating Council for Trans-Siberian Transportation (CCTT), Customs clearance and documentation-related formalities account for nearly 39 % of transit time.

Given the global coverage of the existing logistics systems, cross-border facilitation procedures are playing crucial role in international trade, the effect of border-crossing facilitation is more as the effect of customs tariff reduction.

Taking this into account, enhancing efficiency of international railway cargo transport should be recognized as a priority for railway transport development. Establishing of a seamless transportation system in Eurasia, introduction of paperless technologies with the use of electronic consignment and accompanying documentations are essential yet challenging. Unification of requirements would allow achieving significant progress in the development of international rail-based cargo transport between Europe and Asia.

Further development of rail transport between Northeast and Central Asia and Europe also requires development of seamless multimodal transport services with railway, maritime and road components.

In this connection, UNESCAP initiated the project entitled ‘Development of Seamless Rail-Based Intermodal Transport Services in Northeast and Central Asia for Enhancing Euro-Asian Transport Linkages’ to explore and recommend the ways of improving interconnections between different modes of transport involved into multimodal operations in the above-mentioned subregions.

This study was conducted jointly by UNESCAP and the Coordinating Council for Trans-Siberian Transportation in the framework of this project to review the practices in application of modern information technologies in rail transport, including their use in the region of Northeast and Central Asia, and the application of technologies for the facilitation of border-crossing procedures. It aims to identify ways for enhancing efficiency of information technologies in railway and other modes of transport.

Based on the analysis of: international practices in simplification and harmonization of documents and formalities for multimodal cargo transport by rail through the sea ports and land border crossings, it aims at developing recommendations on:

- harmonization of electronic systems applied for railway and multimodal transport in different countries;
- increasing coordination among various modes of transport through the use of information systems;
- application of information technologies to streamline and facilitate border-crossing procedures in rail transport.

The recommendations could further serve as a reference tool for relevant government authorities of the countries concerned in developing and implementing policies for increasing efficiency of railway-centred multimodal transport.

2. Overview of existing electronic information systems used by the railways of Kazakhstan, Mongolia, the Republic of Korea and the Russian Federation

Electronic document flow in railway transport is a new type of technology designed for processing electronic documents in freight transport, for delivery and issuance of these documents by tenancy to the parties involved.

Electronic document flow allows:

- improving the quality of railway transport services provided to the users through registering shipping documents at client's convenience;
- speeding up the delivery of cargo through reducing time in terminal stations;
- reducing the costs for participants of transport operations associated with preparation, sending and keeping of documents;
- processing cargo documentation using a unified information system;
- reducing time between preparation of main transport-related documents and collecting charges for freight transportation, accomplished work and services;
- increasing freight safety by regulation of access to cargo information, preventing document forgery en route, tracking operations with cargo in transit.

Electronic document flow in cargo transport usually relates to the following types of activities:

- Commercial activities (interactions between the railway carrier and consignors, consignees, carriers of other transport types and transport organizations (ports, railways carriers, forwarders, operators, government control authorities, etc.).
- Freight operation (loading and unloading operations in common areas of cargo railway stations).
- Transport management in freight transportation.

- Financial activities (interaction with participants of a carriage operation regarding fees, collecting penalties from consignors and consignees, payment of fines and interest in case of liability of the railway carrier).

- Railway infrastructure activities (terminal loading and unloading operations, performing of a freight transport operation itself).

This following chapters describe information technologies deployed to ensure seamless railway freight transport in Kazakhstan, Mongolia, the Republic of Korea and the Russian Federation. The description is based on the data provided by railway companies of the respective countries.

2.1 Automation and computerization of transport operations by Kazakhstan Temir Zholy (Kazakhstan)

The information technology formerly used by the Kazakhstan railways (Kazakhstan Temir Zholy, KTZ) has a number of disadvantages: high level of manual data input (80%), requirement for client's presence at the station for the arrangement of shipment documents, client's dependence on station officer, non-transparent business processes for clients and KTZ, fraud and thievery risks, mismatch of data on the start of transportation with data on the end of transportation.

Therefore, in order to ensure a higher level of the international freight transportation service on the Kazakhstan railways a new automated information management system for transport (ASU-DKR) is being actively deployed.

Computerized business processes under ASU DKR include 5 major groups:

- Transport operation planning;
- Transport documentation processing;
- Payments related to freight transportation;
- Cross-border data exchange between information systems;
- Advance electronic notification.

Processes of collecting, approving and confirming shipping requests of the applicable consignment note form are implemented and brought in place and fully deployed on the entire territory of Kazakhstan.

Introduction of ASU DKR in the railways of Kazakhstan resulted in a number of achievements:

- Development of the client-oriented remote access for client's work (web service) eliminated the need for client's personal presence at the railway office to order transport services.

- Automation of approval process of the local transportation under the freight transportation rules and transportation planning procedure resulted in reduction of required time for approval of transport service orders. In addition, it allowed avoiding human mistakes in consideration and approval of orders.

- Clients got the opportunity to promptly track service order approval process, thus transparency of the planning process was ensured and related human mistakes in processing of transport orders were excluded.

- Reliability of information was improved through the use of unified reference books and classifiers of the reference data.

- Effective planning system for railway of station resources and wagon groups for train composition was established.

- Unified tariff calculation and prompt rating were established.

- Automation of business operations for the planning allows making available extra 410,000 man-hour per year (equal to labor of 22 staff).

The system is currently implemented in the pilot mode at Ekibastuz-Uzel railway station, and the results of the pilot application are satisfactory and received positive feedback from the clients. A paperless technology of shipping document processing is also being implemented in the inter-regional and international services at Ekibastuz-Uzel.

ASU DKR implementation steps for the short-term:

- Introduction of the system at Pavlodar railway section.

- Implementation of the system at country-to-country division points.

- Implementation of cross-border [electronic technological document flow] | electronic data exchange.

- Advance notification of customs authorities.

- Complete realization of the ASU DKR and AS CRGP systems in 2016.

ASU DKR further perspectives:

- Implementation of the system for railway services to China countries