Technical Notes on The I.T. Solution Supports The Independent Railway Infrastructure Manager

1 INTRODUCTION

As a sustainable surface transport, the railway transport is now re-gaining its former position on the transport market. The key "buzzwords" – and, at the same time, the key challenges – are competitiveness, open access for the railway operators, and interoperability. No modern railway organisation can rely upon legacy "PPP" technologies anymore – Phone, Pencil, Paper, mostly due to their disadvantages:

- time-consuming, manual input into paper documents, cumbersome "transmission" and processing
- error-prone when processing and transmitting (distortion during voice communication)
- a high risk of introducing wrong data (e.g., a incorrect engine or train number)
- high latency in data communication (dependent on the instant personal presence)
- cumbersome or impossible further processing (e.g. in GVD Analysis or archiving)

An answer to these challenges of legacy technologies is to replace them with a comprehensive information system based on a digital model of the railway traffic. This model is built upon basic objects, such as a train, an engine, and a closure. The digital model and digital technologies rely heavily on the following conditions, however:

- direct integration into the railway technologies – the IS have to be integrated into existing workplaces and the existing dispatching network, not into a mirrored structure
- network-wide data capture – the information systems should be deployed in the network scope, preferably without any "deaf spots" with undesirable inconsistencies
- full-scope planning of the train traffic (as ensured by the below-mentioned systems)
- coupling with DOZ interlocking systems – when possible, such an integrated solution provides the highest consistency, accuracy, and timeliness of the data

2 OVERALL STRUCTURE OF IS FOR INFRA MANAGER

As in any other enterprise, the infrastructure manager can see his business activities separated into three broad levels, and their support includes the key IT solutions provided by OLTIS Group a.s., as detailed below:

- strategic management – long-term general planning, the infrastructure development (IS of infrastructure), planning the maintenance works and temporary closures (IS Closures), planning the capacity (ISOR KADR), archives and decision support systems (ISOR APD)
- tactical management – mid-term planning, specifying the closure plans (IS Closures), designing timetables (IS KANGO), selling the capacity (ISOR KADR), managing personnel (EDO)
- operational management – short-term, instant traffic control with local scope (IS Station Master), regional scope (ISOR VD), and network scope (ISOR CDS)

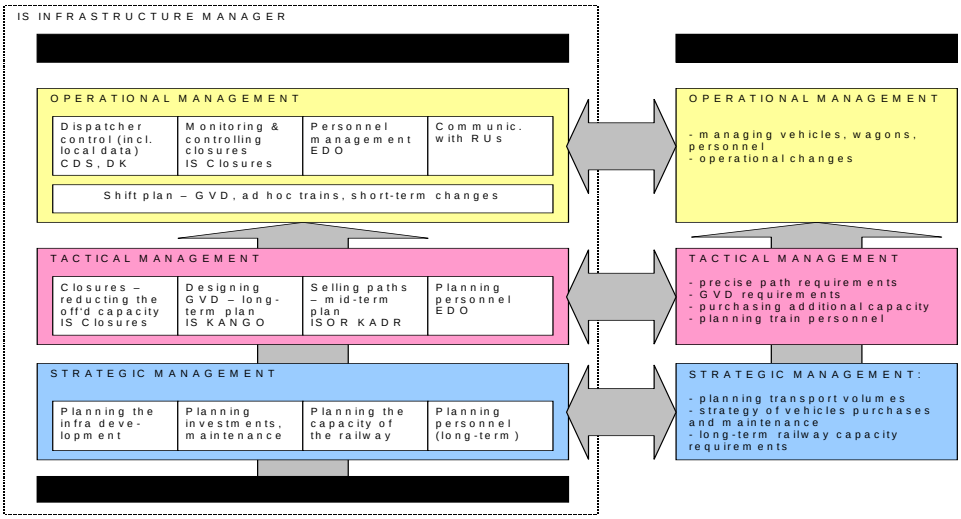

Figure 1: Architecture of the integrated IT solution for infrastructure manager

The overall schema (Figure 1) suggests also communicating with a railway undertaking (RU), on both the process and IT level. Here, any licensed RU can be assumed (passenger or cargo).

The information systems of the operational management can be seen as the mission-critical systems for controlling the train traffic (ISOR CDS – an umbrella system for supervising the whole network, ISOR RVD – distributing the shift plan, Station Master for the local level); however they cannot get along without the support of the other underlying systems concerning mainly data on the network, timetable (GVD), and overall decision support and capacity planning (IS KANGO – timetables, IS Closures, ISOR KADR – selling the capacity).

3 CASE STUDIES: SUCCESSFUL IMPLEMENTATION IN CD AND ZSR

Czech and Slovak Railways (CD and ZSR) have grown from the same environment (CSD), which includes identical or similar vehicles, operational technologies, regulations, and others. The similar environment simplifies the implementation of the IS. In both railway networks, the ISOR family is deployed with a Station Master (DK) at its local level. The systems rely heavily on data communication among their various components or with external IS. The local level communicates with the interlocking systems (SZZ-ETB, ESA, and DOZ).

The OLTIS Group company, based in Olomouc, Czech Republic, is a leading vendor of the IS for controlling the railway transport, from preparing and planning the transport to real-time monitoring and assessment. The company is also a leading exporter in the railway IT industry.

For more info: official web pages of OLTIS Group a.s., http://www.oltis.cz/index.m?lang=EN
Ing. Štefan Mestický (mesticky@oltis.cz) is CEO of OLTIS Group a.s. and Chief Solution Architect for the information systems of controlling the railway transport.

Ing. Mgr. David Krásenský (krasensky@oltis.cz) is a business consultant of OLTIS Group a.s. specialized on the strategic concepts of the information systems.

Authors:
D. Krásenský* & Š. Mestický, OLTIS Group
**Corresponding author: krasensky@oltis.cz*