Information and Communications Technology for Railway Traffic between Europe and China

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Agenda (1/2)

- Background
- Objectives
- Methodologies
- Innorail Express
- Main Challenges

Agenda (2/2)

- Implementation business network
- Information and Communications Technology (ICT) solutions for Innorail Express
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Background

- Kouvola is a leading railway city located in the south-eastern part of Finland as well as in the border area of EU and Russia.
- Kouvola aspires to be a safe and leading international railway business and know-how center by 2010*.
- Innorail Kouvola Oy is promoting a new railway traffic service between Kouvola, Finland and Tianjin, China, i.e. Innorail Express.

* Reference: http://www.innorailkouvola.fi/en/innorail/vision

Objectives

- To survey the current situations in railway transport between Finland and China, as well as the most popular ICTs in railway transport.
- To tailor reasonable and available solutions, which especially focus on ICT area, to meet the challenges of Innorail Express project.

Methodologies

- *Literature study* on current situation of railway transport between Finland and China as well as ICT knowledge.
- *Interviewed* with railway companies, forwarders and shippers of Finland, China and Russia.
- *Case study* on Innorail Express

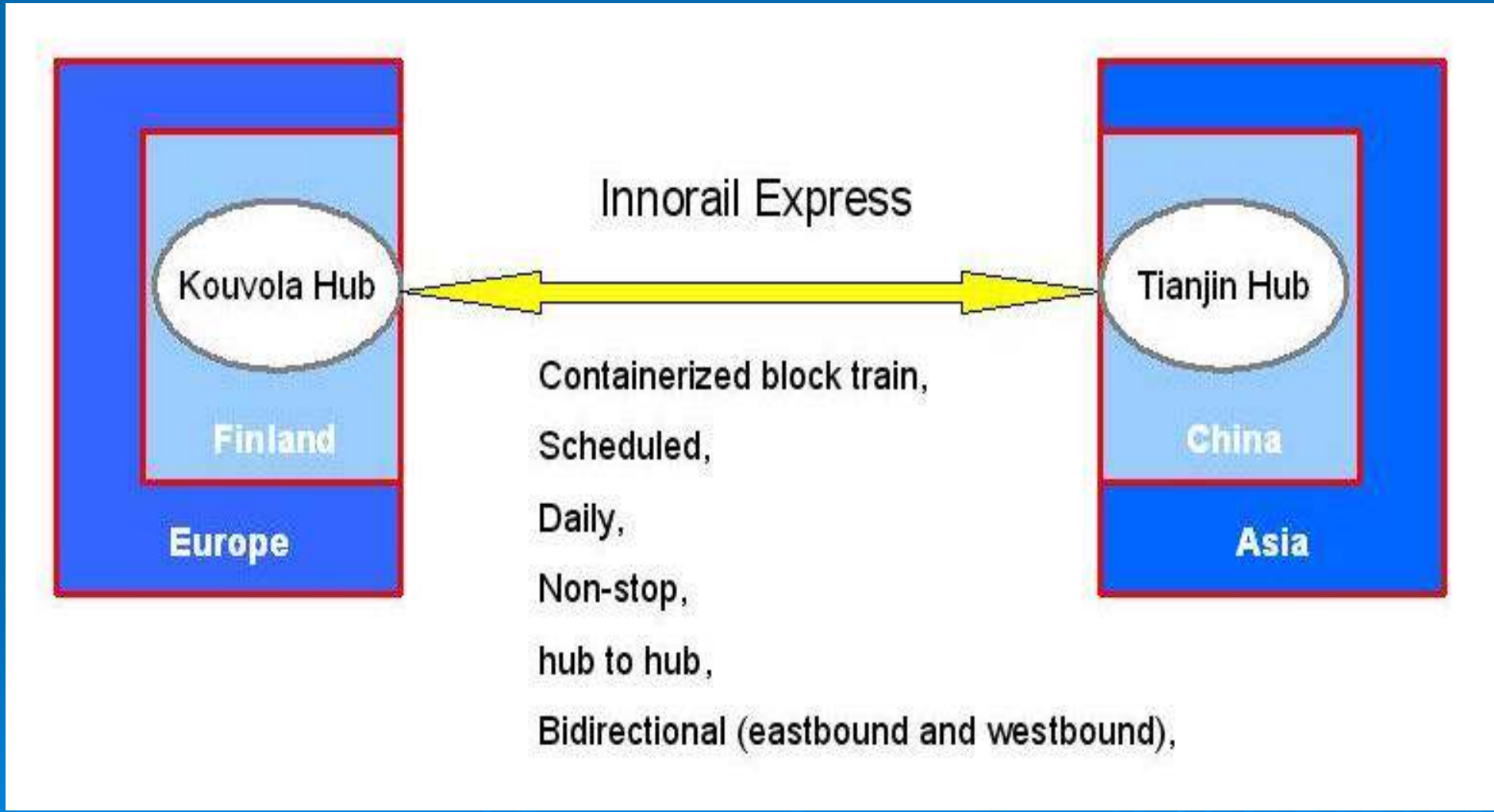
Innorail Express

- Service concept

  Innorail Express is an International Transit Railway Transport (ITRT), which is scheduled, daily, bidirectional (eastbound and westbound), non-stop, container block train service between hub Kouvola and hub Tianjin (hub to hub) through Russia*. It mainly makes use of the Siberian Land Bridge (SLB) and the Trans-Manchurian railway.

* Reference: Jani Tikkanen, senior partner, ELC Finland Oy

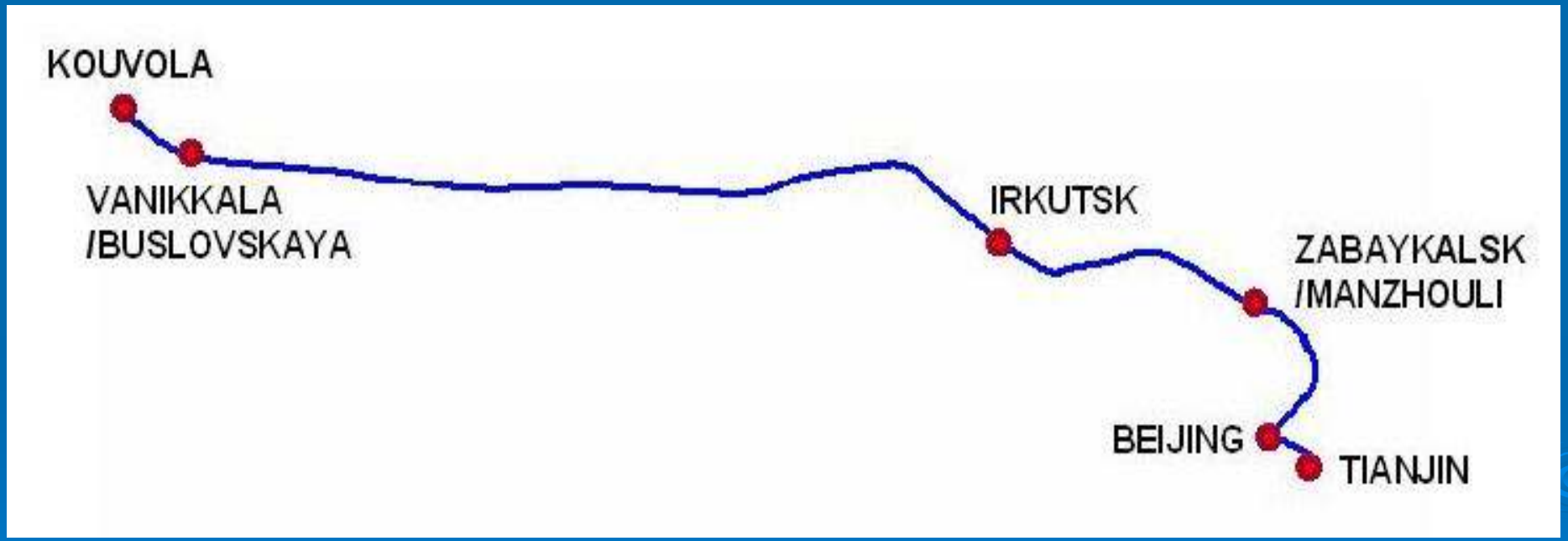
Innorail Express



Reference: based on the idea of Jani Tikkanen, senior partner, ELC Finland Oy

Innorail Express

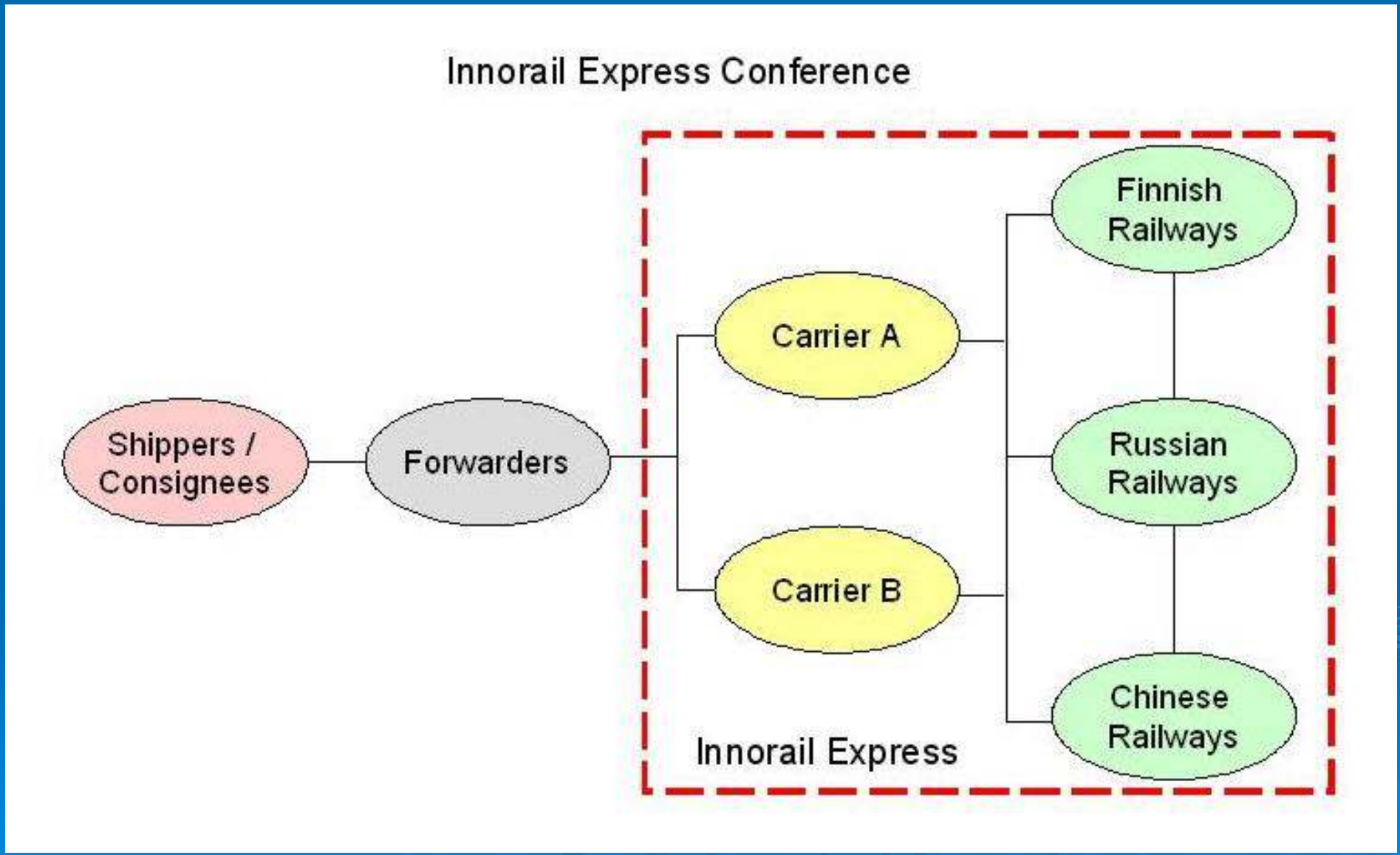
- Innorail Express Route



Main Challenges

- A suitable implementation business network
- An integrated information system
- Exercisable document flows
- Security issues

Implementation business network



Reference: Innorail Kouvola Oy

ICT solutions for Innorail Express

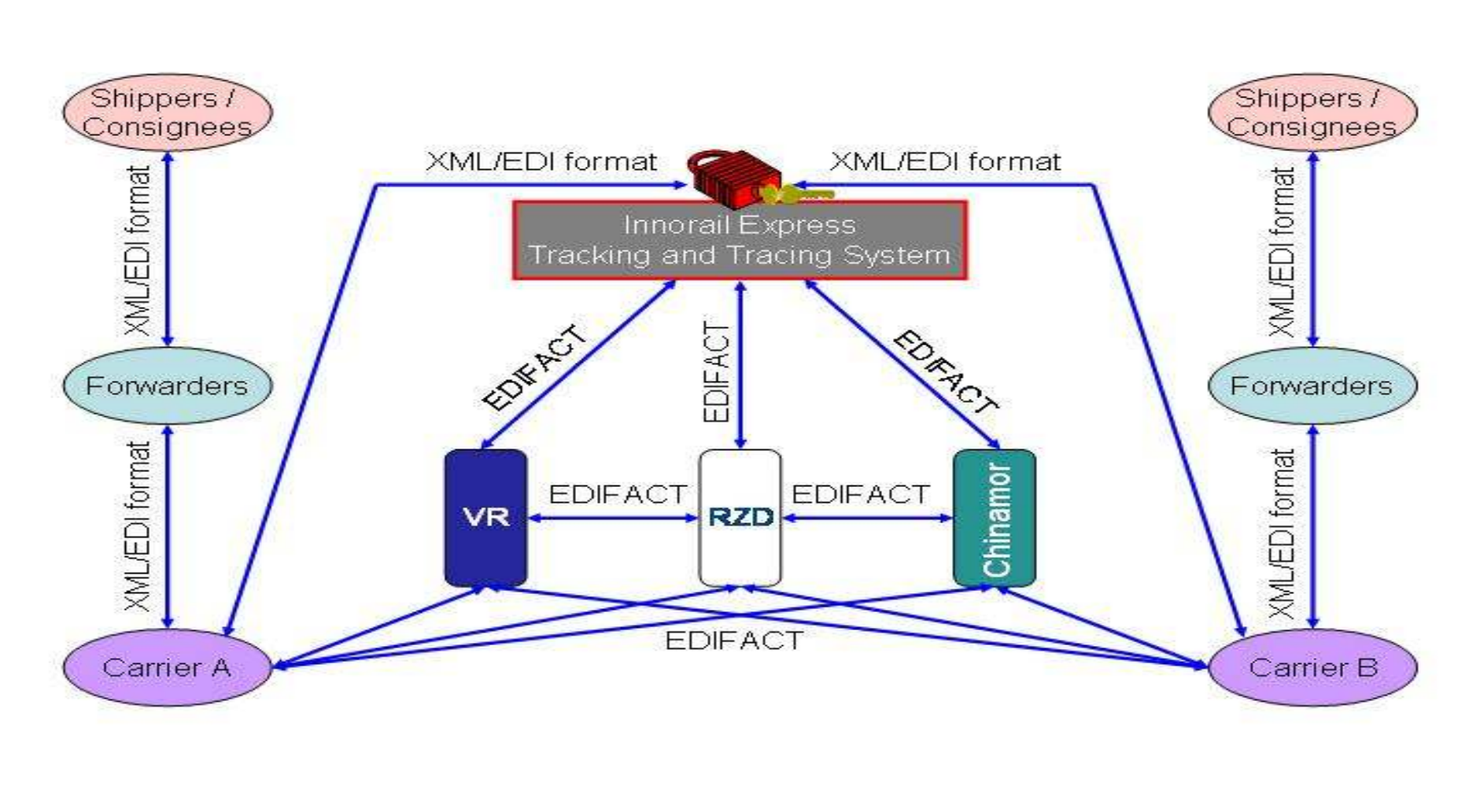
- Message formats in the integrated information system

  - EDIFACT = Electronic Data Interchange For Administration Commerce and Transport

  - XML/EDI = eXtensible Markup Language/EDI

ICT solutions for Innorail Express

- Integrated information system



ICT solutions for Innorail Express

- Exercisable Document Flows

The traditional paper document process is time-consuming. It is necessary to introduce electronic document flow according to eastbound* and westbound* transport of Innorail Express.

* Eastbound and westbound document flows are in Appendix A and B respectively.

ICT solutions for Innorail Express

- Security issues

  - RFID = Radio Frequency Identification
  Attaching RFID tags into or onto cargos

  - Bar code

  - Tracking and tracing system
  The respective control or monitoring systems of Finnish, Russian and Chinese railways are utilized to provide wagon and container tracking and tracing services to Innorail Express. Each control system collects exact data and then integrates real-time data to the database of Innorail Express Tracking and Tracing System.

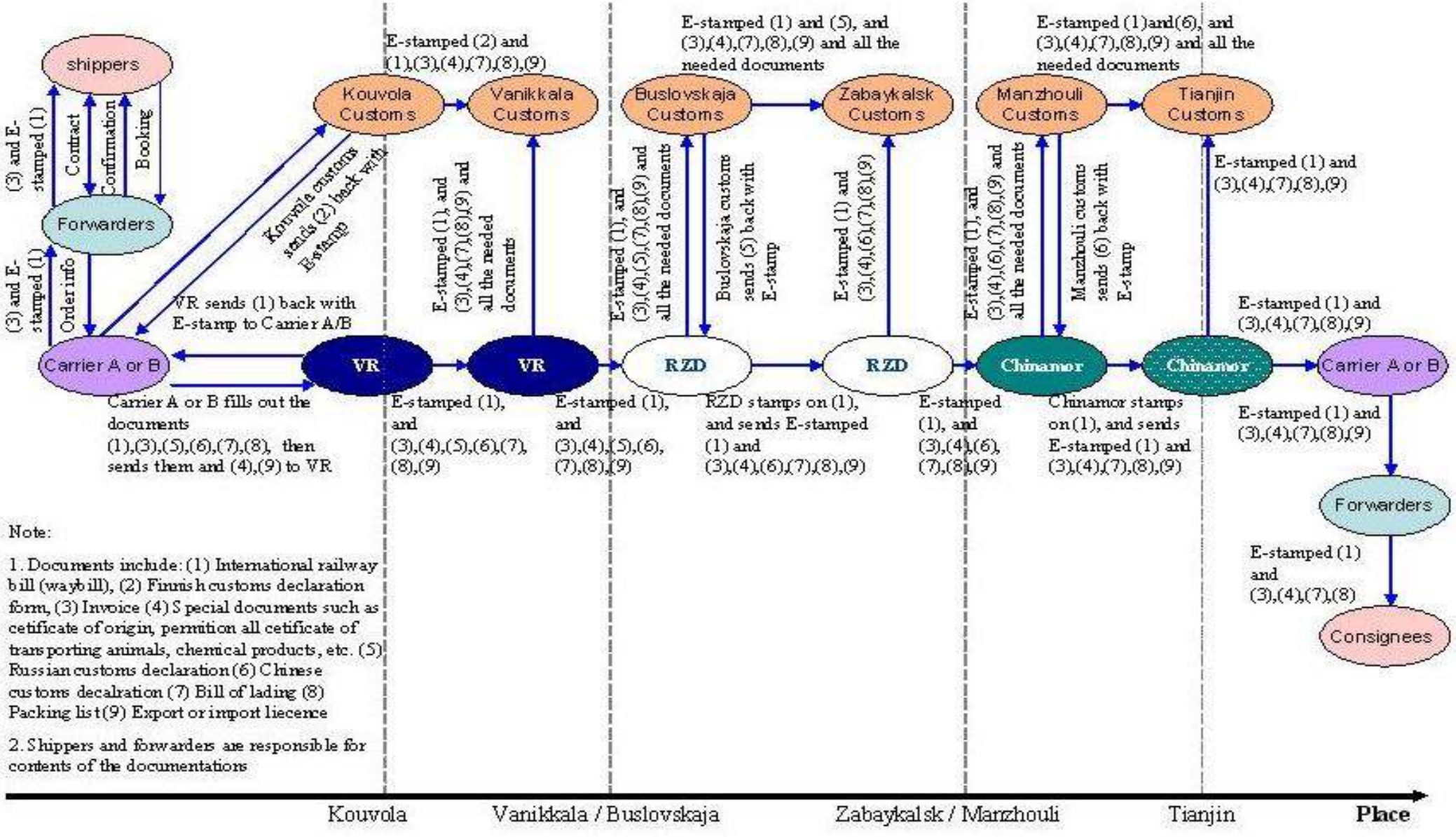
Conclusions

- Railway traffic and ICT
- All the ICT solutions in my thesis are able to be implemented for Innorail Express project immediately.
- The whole communication network works quite well in academic analysis as well as practical document flow management and security solutions on cargos, containers and wagons.

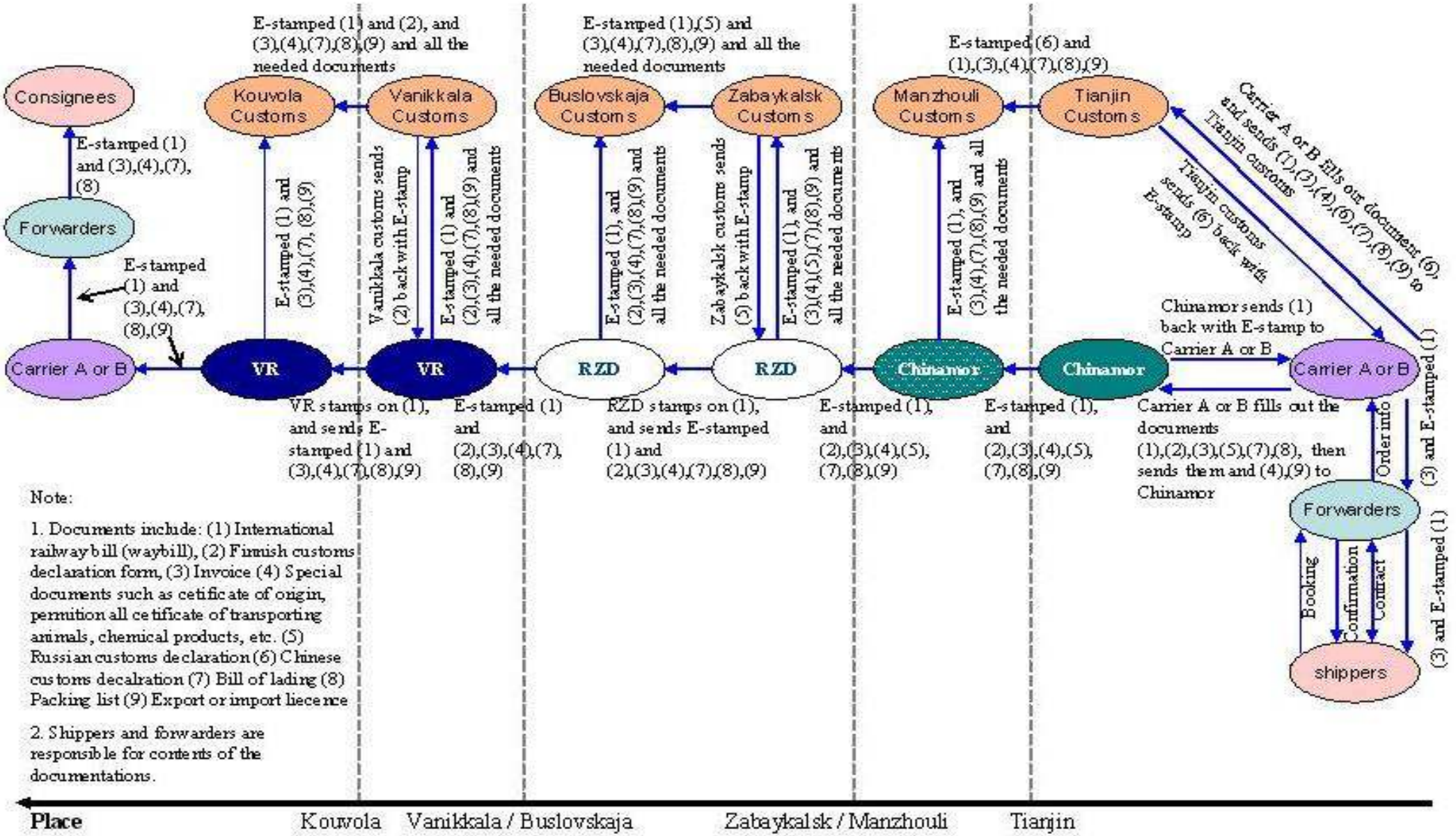
Future work

- To continue the current work to make an intensive research on the ICT solutions
- To update the current ICT solutions and bring forward better solutions.
- To extend the ICT solutions to other projects such as Innorail Express Korea and Innorail Express Japan.

Appendix A - Document Flow in Eastbound Transport



Appendix B - Document Flow in Westbound Transport



Thank you!