

PoRIS

Towards Transnational River Information Systems to
Foster Commercial Logistics and Public Safety

Prof. Dr. Siegfried Voessner, Graz University of Technology

Expert Group Safety (EG SEC) Meeting, Danube Commission (DC),
Budapest, February 20th 2019



Donaukommission – Commission du Danube – Дунайская Комиссия – Danube Commission

Austria Bulgaria Croatia Germany Hungary Moldova Romania Russia Serbia Slovakia Ukraine

PoRIS – Project Facts



- Security Research funded by Austrian KIRAS Grant (FFG)
- Duration: 10/2014 – 03/2016
- Partners
 - Federal Ministry of Interior
 - Graz University of Technology
 - University of Vienna – ALES
 - via.donau, Federal Ministry of Transport, Innovation and Technology



 Bundesministerium
Inneres

 Federal Ministry
Transport, Innovation
and Technology **viadonau**



universität
wien



Agenda

- Problem and Motivation
- Course of Action
- Results
- Conclusion



Situation

- The waterways between Western and Eastern Europe represent an important transportation connection for the European inland freight transport
- Waterways are important for merchandise and passenger traffic
- Transnational traffic (10 Danube neighboring states)
- Security-relevant traffic (goods & people)

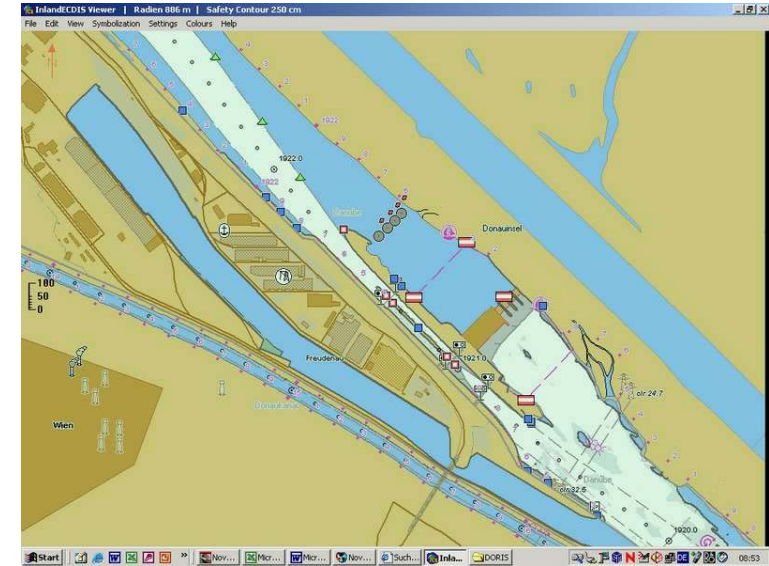


Picture Source: http://www.donauschiffahrt.info/fileadmin/group_upload/7/Daten_und_Fakten/Wasserstrassenkarten/Donaukarte_de_2010.jpg

Current Development of Inland Water Transportation

Inland water transportation gains in importance – Challenges rise

- Safety requirements rise
- Effort of handling the traffic rises
 - Traffic-management
 - Security checks
- For this reason increasing effort for
 - Shippers
 - Operators of the traffic routes
 - Authorities and Public safety organizations
- Exchange of information between organizations seems to become a more and more important factor
- Single riparian states have already established River Information Systems (RIS)
- Consequently, an essential basis for an integrated concept is already existing



Picture source: http://www.doris.bmvit.gv.at/inland_ecdis/screenshots/

Project Goals

As a part of this study the potentials of an information system network will be tested

- Analysis of the Austrian RIS (DoRIS) in the context of public safety
- Exploration of an expanded transnational coupling of DoRIS with systems of the Danube riparian states

Expected improvements:

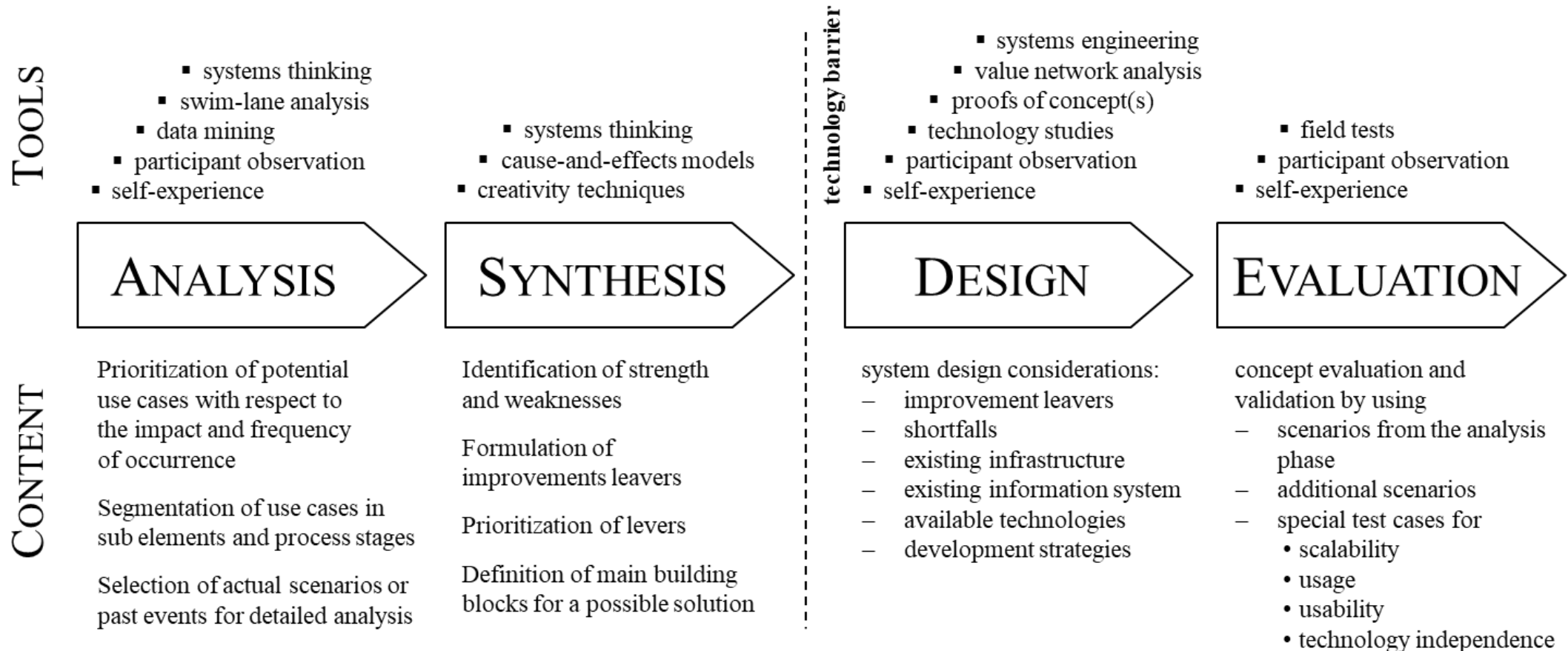
Economy

Reduction of burden of ship inspections for shippers
→ Acceleration of transaction, gain in time
→ Avoidance of unnecessary double-checking

Safety

Increase of the control efficiency for authorities
Optimization of resource use for BM.I
→ Risk-based resource planning

Socio-Technical Research Framework



Source: Vorraber et al. 2015

Workshops

Date	Topic	Place
29.10.2014	Kickoff meeting	BMI Wien
06.11.2014	Training ship logistics	viadonau Wien
17.11.2014	Ship control - inspection	FI Handelskai Wien
19.12.2014	Workshop total process analysis	ALES Wien
13.02.2015	Meeting with the club of captains	Fahrgastschiff Admiral Tegetthoff
02.03.2015	Meeting with the BMVIT	BMVIT Wien
22.05.2015	Improvement lever workhop	viadonau
17.11.2015	Proof of Concept Workshop	viadonau
25.02.2016	Proof of Concept Workshop II	ALES Wien
21.03.2016	Evaluation meeting	FI Handelskai
07.04.2016	Final meeting	BMI Wien



Identified Improvement Levers

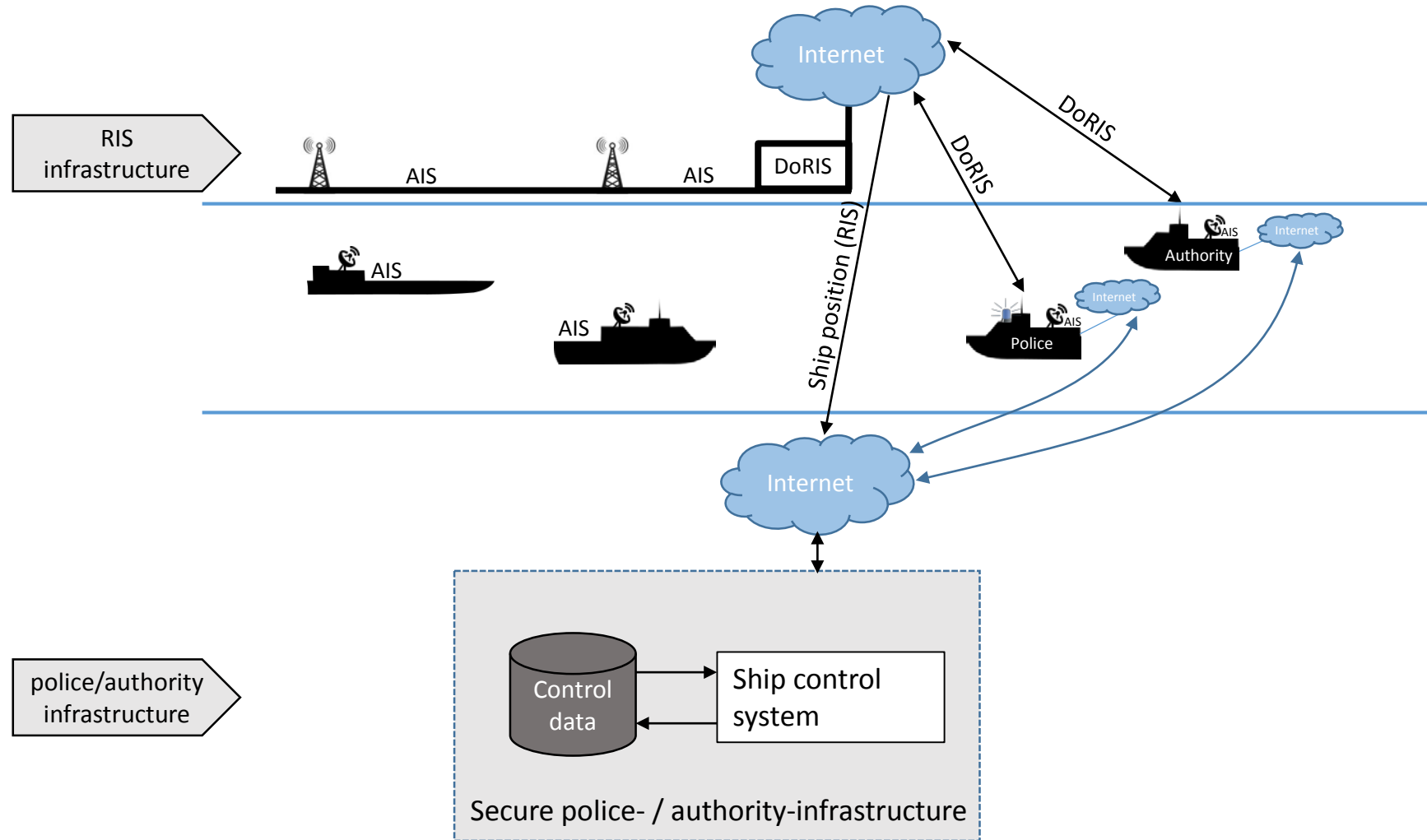
Improvement Lever	Impact		
	Police	Navigation authority	Shipper
Pre-transmission of passenger data in standardized format	Time saving		Time saving
Availability of historical and current control data from other countries	Self-protection, facilitating of the control planning, prevention of multiple controls	Self-protection, facilitating of the control planning, prevention of multiple controls	Time saving due to omitting multiple controls
Ship control of cruising ships	Time saving	Time saving	Time saving
Purposeful controls	Prevention	Purposeful technical inspection, planning of recurrent inspections	Fair rules and the observance of these
Uniform work permit for several countries along the Danube	improved check procedure		Bureaucracy depleting
More flexible service planning for control authorities			Time saving due to shorter waiting times
Unified training requirements along the Danube		improved check procedure	Bureaucracy depleting, simplification

Improvement Lever – Prevention of multiple controls

Name	Prevention of multiple controls
Brief description	The opportunity to request the control status shall contribute to avoid multiple controls. Currently it is not possible to “look over” the national borders. It is not evident, if a ship has just been controlled in a neighbouring state. The colour marking of ships in a web portal shall provide information about just-performed inspections respectively shall reproduce the control history.
Protagonists	Ship, RIS, police
Organisational requirements	The query of the ship’s position from the RIS, link to the data of the police-control-database, internet connection to transfer data, access to the web portal
Legal requirements	Legal basis for the data exchange with neighbouring states, Data transmission power in national laws, Need for changes in bilateral and multilateral agreements
Activator	Preparation to upcoming controls, control planning
Process flow	<ul style="list-style-type: none"> • Consultation of the ships in the immediate vicinity • Creation of a control plan • Conducting controls based on appropriate criteria










Quelle: PoRIS internal progress report



System Design: Separation of Control and RIS-data

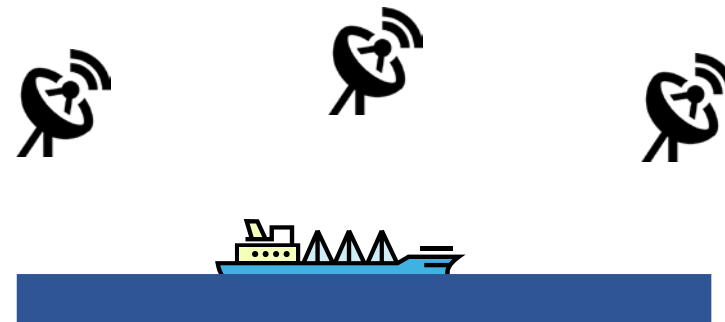


RIS Implementation and Data Exchange Along the Danube

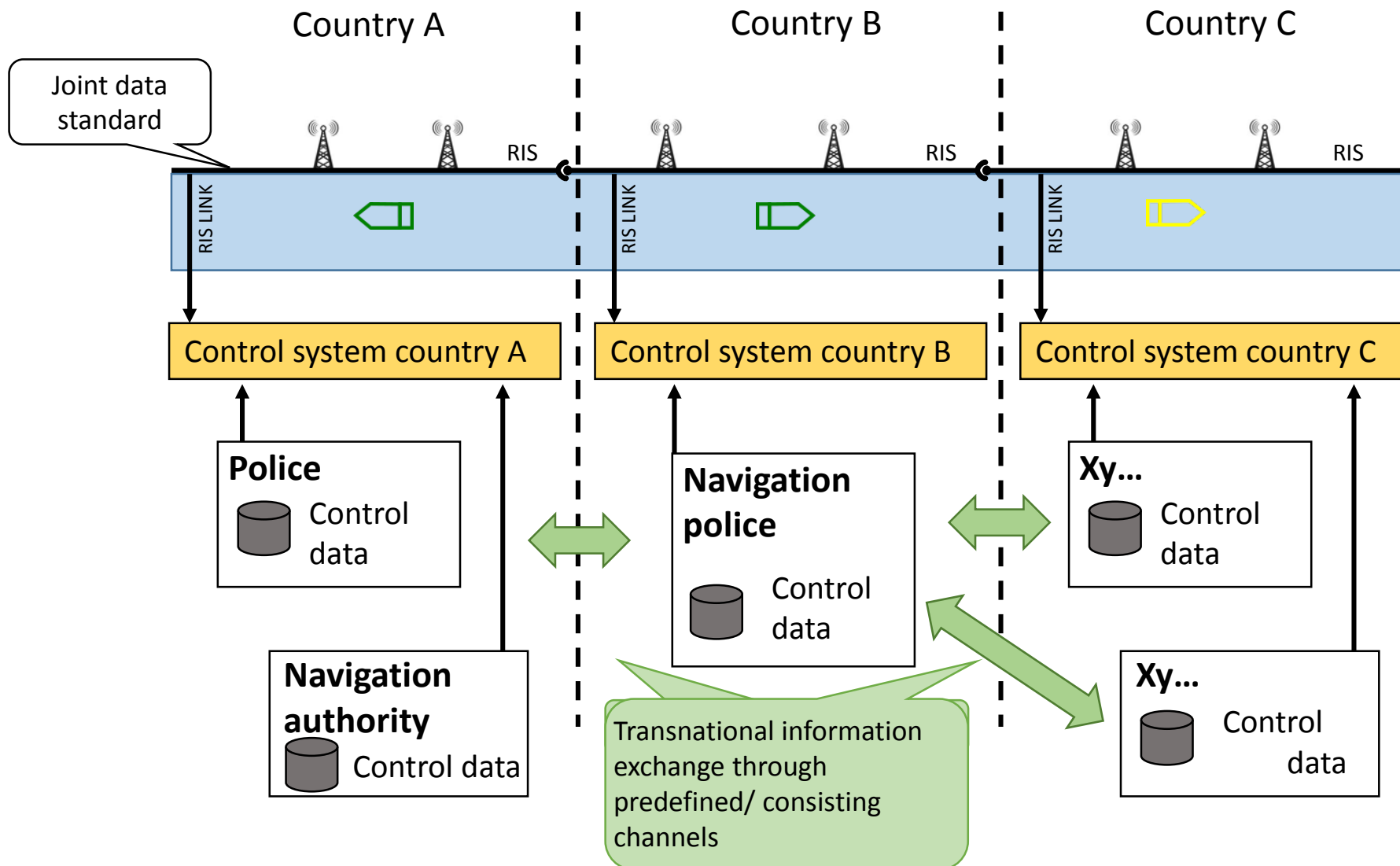
National RIS implementations

									
Technical infrastructure (e.g. AIS)	✓	✓	✓	✓	✓	✓	✓	✓	✓
RIS	✓	✓	✓	✓	✓	✓	✓	✓	✓
Data network		Position data							

- ✓ existing
-  functional
- ✓  In planning



System Design: Transnational Control System



Ship symbols v2

- Cargo ship



- Dangerous goods ship



- Passenger ship



Country-specific meanings and presentation possible



Ship is
anchored



Ship is in
motion

Ship symbols v2

- Meaning of the ship presentation

- „New“ - Ship unknown



- Was controlled in their own country without objection



- Was controlled in their own country with slight complaint



- Was controlled in their own country with serious complaint



Ship symbols v2

- Meaning of the ship presentation

- Ship marked for inspection



- Information about the last control in the foreign country (worst result is displayed):

- Everything OK



- Slight complaint (e.g. administrative offense)



- Serious complaint (e.g. criminal delict)



Proof of Concept - Map

The screenshot displays the PoRIS Kontrollinformationssystem web application. The browser address bar shows 'localhost/porisweb/poris.php'. The page title is 'PoRIS Kontrollinformationssystem' and the user is identified as 'FI Handelskai | Florian Schögl'. The date and time are '24.02.2016 17:22:45'. The interface is divided into several sections:

- Karte:** A map showing the Danube river area in Vienna, with various districts and ship positions marked.
- Nächste Schiffe (zeitlich):** A list of ships with their names and SoG/CoG values.
- Nächste Schiffe (örtlich):** A list of ships with their names and SoG/CoG values.
- Kontrollplanung:** A section for scheduling inspections, divided into 'Vormittag' and 'Nachmittag'.

The ship list includes the following entries:

Ship Name	SoG	CoG
VIKING PRESTIGE	0.19 km/h	163.5°
VIKING SKIRNIR	0 km/h	137.2°
ADMIRAL TEGETHOFF	0.19 km/h	164.9°
WIEN	0 km/h	345.8°
POLIZEI WIEN	0 km/h	152.7°
SCENIC CRYSTAL	0 km/h	0°
BEETHOVEN	0.19 km/h	159.7°
WIENTANK 1	0 km/h	0°
RIVER BEATRICE	0.19 km/h	180.9°
RIVER1	0.19 km/h	182°
WIENTANK 2	0 km/h	288.8°
FEUERWEHR WIEN 1		

At the bottom of the page, there are logos for BM.I, TU Graz, viadonau, universität wien, AL ES, bm vti, FFG, and KIRAS.

Proof of Concept – „Subway Schedule“

The screenshot displays the PoRIS Kontrollinformationssystem web interface. The browser address bar shows 'localhost/porisweb/poris.php'. The page title is 'PoRIS Kontrollinformationssystem' and the user is logged in as 'FI Handelskai | Florian Schöggel'. The date and time are '24.02.2016 17:21:50'. The interface is divided into several sections:

- Karte:** A map view showing the location of ships relative to the FI Handelskai.
- Nächste Schiffe (zeitlich):** A list of ships with their arrival times, such as 'VIKING PRESTIGE' at 17:21:50.
- Nächste Schiffe (örtlich):** A list of ships with their current location, such as 'RUBISHIPS IV' at the FI Handelskai.
- Kontrollplanung:** A control plan showing the schedule for the morning and afternoon.

The map shows a central vertical line representing the FI Handelskai. Ships are represented by icons and labels, including 'RUBISHIPS IV', 'TWINCITYLINER2', 'SVETIN/TWINCITY LINER', 'AMÉLIA', 'SAVOR', 'INN-31-P-2', and 'SWISS INDUSTRIA'. The map is divided into 3-hour intervals (3h, 2h, 1h) on both sides of the FI Handelskai.

The 'Nächste Schiffe' list includes the following entries:

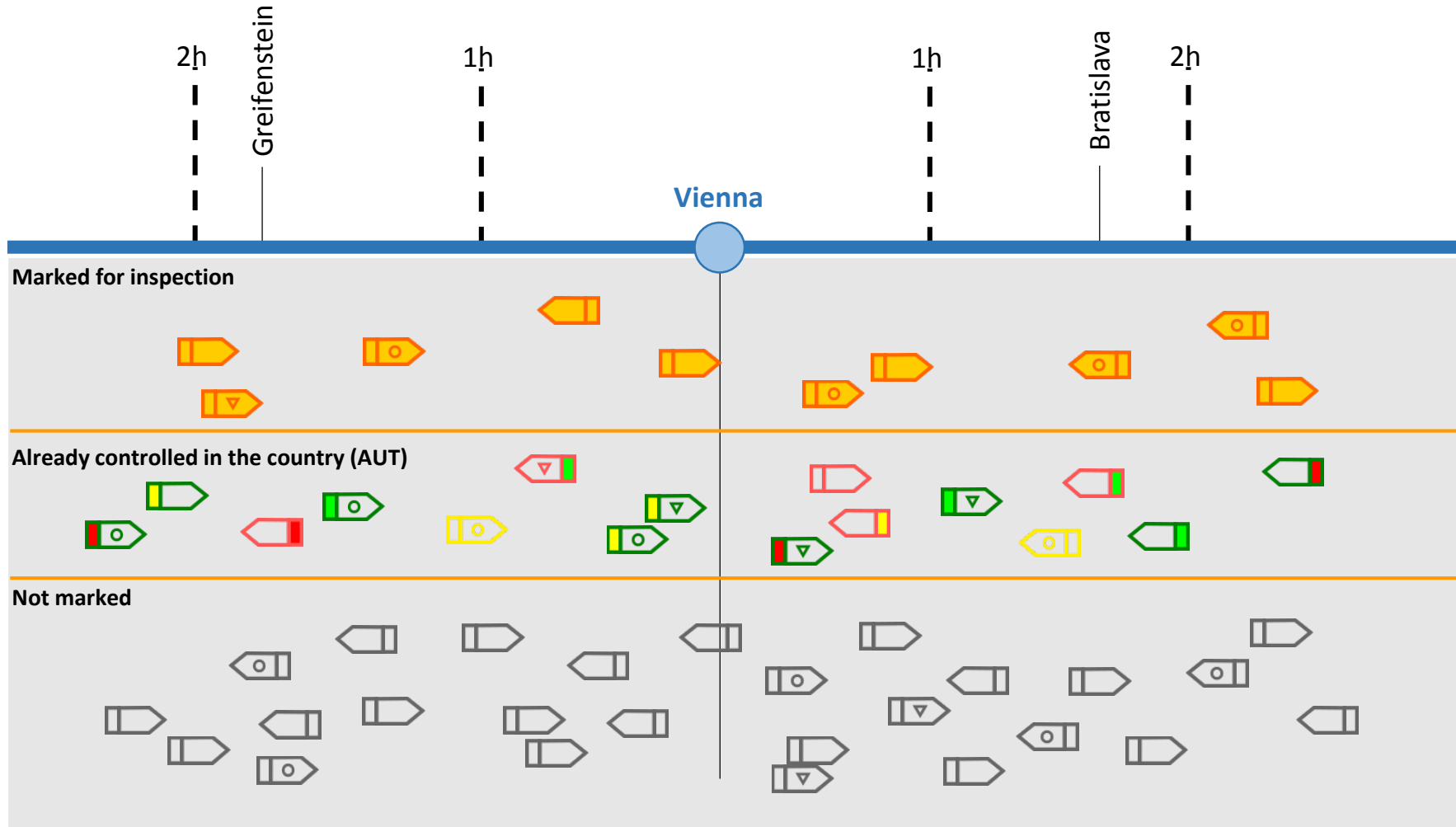
- VIKING PRESTIGE (SoG: 0.19km/h CoG: 164.9°)
- VIKING SKIRNIR (SoG: 0km/h CoG: 137.2°)
- ADMIRAL TEGETTHOFF (SoG: 0.19km/h CoG: 189°)
- WIEN (SoG: 0km/h CoG: 312.3°)
- POLIZEI WIEN (SoG: 0km/h CoG: 60.1°)
- SCENIC CRYSTAL (SoG: 0km/h CoG: 0°)
- BEETHOVEN (SoG: 0.19km/h CoG: 160.9°)
- WIENTANK 1 (SoG: 0km/h CoG: 280.1°)
- RIVER BEATRICE (SoG: 0.19km/h CoG: 179.2°)
- RIVER1 (SoG: 0.19km/h CoG: 164.7°)
- WIENTANK 2 (SoG: 0km/h CoG: 288.8°)
- FEUERWEHR WIEN 1

The 'Kontrollplanung' section shows a grid for 'Vormittag' and 'Nachmittag' with empty slots for scheduling.


Logos at the bottom of the interface include: BM.I (Bundesministerium für Inneres), TU Graz, viadonau, universität wien, AL ES, bm vti, FFG, and KIRAS (Sicherheitsforschung).

Proof of Concept: Control overview

Ships in the surrounding area





Proof of Concept: Control logic

 **DONAUPLUS**
SoG: 0.2 km/h CoG: 172°

ENI: 302 11455
Shiptype: Frachtschiff
Draught: 2 m
Length: 30 m
Beam: 10 m

Letzte Kontrolle(n):

 FI Handelskai 30.03.2016 11:11
Geschaeftszahl: A_356/16
Keine Anmerkungen.



Kontrollzeit:

Kontrollstatus:

Geschaeftszahl:

Anmerkung:

Proof of Concept: Evaluation



Evaluation workshop FI Handelskai
21.03.2016

Summary

- ✓ Workshops with stakeholders realised
- ✓ Improvement levers identified and prioritised
- ✓ Proof of Concept implemented
- ✓ Evaluation of Proof of Concept (User-acceptance) completed

Future Prospects

- International follow-up project



Köszönöm a figyelmet!



Backup

Outtakes