Inte-Transit

Newsletter // Issue 4

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EDITORIAL

Welcome to the 4th and final issue of the INTE-TRANSIT project newsletter!

INTE-TRANSIT is a MED project of strategic value for the Mediterranean ports implemented by 8 partner organisations from 4 Mediterranean countries. The basic aim of the project is to achieve a better organization of the MED ports and their logistic activities areas and establish a cooperation framework between relevant stakeholders in the MED countries.

Inside this issue you will find more on the INTE-TRANSIT project final achievements and specifically the technologies developed and results achieved in both INTE-TRANSIT Group Pilot activities. In addition, an article about the Lessons learned & conclusions drawn from the application of ICT technologies for tracing of containers & yard equipment in the INTE-TRANSIT Pilot of PCT at the Port of Piraeus in Greece is also included.

INTE-TRANSIT results have been successfully presented, among others, during the INTE-TRANSIT final Conference and Demonstration, organised in Athens, on 24-25 June 2015. During this unique showcase participants had the chance to learn more about the latest developments in the area and discuss about future needs and trends in ports and port logistics with well-known experts from academia, industry, European and national public authorities, and port operators. More information about this major dissemination activity can be found also inside this issue.

In addition, an article about the 5th project Training activity, took place in Piraeus, on 23 June 2015 is also provided along with information on the latest project dissemination activities in related 2015 Conferences.

Taking this opportunity, we would like to thank all partners for their contribution and efforts on the realisation of the project!

Enjoy reading!

Mrs. Geli Latsa
Dissemination Manager
SEAbility Ltd.

Group A pilot activities - Results

John Kanellopoulos , PCT

Pilot Group A is focusing on the improvement of monitoring and tracing containers and yard equipment that will allow the members of the group to pursue the objectives of this program. As already described in the previous newsletter, this has been achieved by the development of a GIS based application, the INTE-TRANSIT Management Server, client applications, and by installing DGPS and RFID devices on yard equipment.

The INTE-TRANSIT Management Server and the respective clients have been deployed and tested in all three ports. In Piraeus the pilot has been deployed using straddle carries and trucks, in Valencia and Koper using reach stackers and trucks. A number of issues that surfaced regarding the place of installation of the RFID reader on reach stackers, the accuracy of the DGPS correction signal and WiFi coverage issues at pilot sites were resolved.

The pilot showed that the time required for the traceability of containers in all three ports has dropped virtually to zero since at any given point the exact location of containers participating in the pilot were available. The geographical position of containers was available in sub-meter accuracy that allowed the transformation to the Block-Bay-Row-Tier format that terminal users are familiarized with. The perception about the security level of goods in the yard by terminal managers and stakeholders has significantly improved since container movements in the yard are accurately known.

The most significant part though about this pilot was that the data collection phase proved from a very early stage on that there were patterns showing space for improvement regarding fuel consumption and CO2 emissions by yard trucks. Based on these findings, both PCT in Piraeus and NOATUM in Valencia decided to move forward and analyze possible ways to improve.

PCT has developed a Truck Monitoring System based on the experience acquired through the development and use of the INTE-TRANSIT Management Server that has allowed to analyze driving behavior data. As a result, driving seminars for internal truck drivers were organized that have led to a 7% reduction in fuel consumption and emissions.

Moreover, gathered data are undergoing an analysis for the deployment of route optimization algorithms. Initial data show the possibility for an additional 10% reduction in fuel consumption and CO2 emissions. As a result, both NOATUM and PCT are moving forward to install positioning devices on all yard equipment in order to get them ready for the deployment of route optimization modules that can be further analyzed and lead to further productivity improvement and reduction in fuel consumption and CO2 emissions.

Finally, the process of analyzing and deploying the pilot has been catalytic in establishing a base of communication between participating ports and revealing opportunities for cooperation in the future that can prove beneficial to port stakeholders.

Lessons learned & conclusions drawn from the application of ICT technologies for tracing containers & yard equipment in the INTE-TRANSIT Pilot of PCT

Athanasia Tsertou, ICCS

Mediterranean (MED) port terminals are major logistic hubs for the circulation of goods, not only within the MED basin but also connecting European countries with key Asian ports. The efficiency of operations inside the port terminal as well as the connection of the terminal to associated warehouses and logistics areas are a constant challenge for the port operations personnel. INTE-TRANSIT has shown how ICT technologies may assist terminal operators address this challenge: they have been deployed to improve the ability of the port terminal in having an accurate and almost real-time monitoring mechanism for containers as well as yard equipment (trucks, reach stackers, straddle carriers etc.). The technologies which have been considered are the Differential GPS (DGPS) technology which achieves a close to one meter accuracy in determining the position of the containers and yard vehicles, not achievable by legacy COTS (Custom Off The Shelf) GPS receivers. Moreover, Radio Frequency Identifier (RFID) technology has been used for container identification so that manual intervention is minimised in the container transfer and storage processes.

The scenarios that have been implemented and tested in the pilot activities are the following:

- New Container insertion and registration to the INTE-TRANSIT Management System's (ITMS) database.
- Container assignment to a truck vehicle and transport to bay area.
- Container assignment to a reach stacker vehicle and storage.

The above scenarios involved extended testing of the ITMS Server and Client functionality in conjunction with the hardware equipment installed to the pilot vehicles and their corresponding assignments:

The ITMS Server software and its modules was installed and running under a windows-based computer with access to the existing network infrastructure of PCT.

The ITMS Client software was installed and running under a windows-based tablet or rugged portable PC which is placed inside the corresponding Pilot's vehicle.

The DGPS Base Station served as a reference point to a known geographical point. It is implemented through a GPS receiver connected to a windows-based computer at the Pilot site running the RTKLib software. The data collected from the RTKLib were provided to every ITMS Client through the existing network infrastructure.

The installation of client terminal hardware on the vehicles of the yard (1 truck and 1 reach stacker, RS).

Basic challenges which were faced and addressed during the pilot testing was the recalibration of the RTKLIB configuration in conditions of the terminal yard (metallic containers, heavy vehicles and machinery present), compatibility issues with legacy equipment often found in a terminal yard, weather conditions which vary at a port terminal and may influence the success of the pilot and finally, WiFi limitations in a setup where most terminal equipment uses it for transfer of monitoring data. The main purposes of a successful monitoring of the transfer and storage of a container inside the storage areas of the port and of keeping a detailed inventory of the stored containers while also providing the ability to a remote user having all this information properly displayed and visualized inside a GUI were achieved. Nevertheless, in order to move to a market product quality, a number of iterations are necessary in order to ensure the long-term stability of the system (mainly of the GPS signal) in actual yard conditions and to achieve scalability when being deployed in all vehicles of the terminal yard.

Open source software developed in the Pilot Group B of INTE-TRANSIT to facilitate decision making by port terminal managers

Gracia Buiza Camacho, IAT

In order to improve the management of port terminals on the basis of information management, the Group B Pilot in INTE-TRANSIT aims to provide an efficient and accurate monitoring of goods not only in the terminals located in the port area but also between the port and the inland terminals. This specific objective responds to the need of allowing containers/vehicles to clear procedures in the customs facilities inside a Logistic Area located at a certain distance from the port and ensuring the control of the flow of goods along the route between these two localizations.

This way, during the movement of the truck, the system developed by the Group B Pilot (called "Manipulation Detection System") controls if it:

- Goes out of the predefined route.
- Drives in a low speed.
- Stops along the route unexpectedly.
- Does not have GPS Data in one or more points along the route.

This system uses signals emitted by a GPS system located on the truck during its trip and checks if there is any strange or suspicious behavior that makes a manipulation of the transported goods possible. The final output linked to each trip is: "route with incidents" (so the user cannot trust the goods transported, they could have been manipulated) or "route without incident" (the user can trust the goods transported).

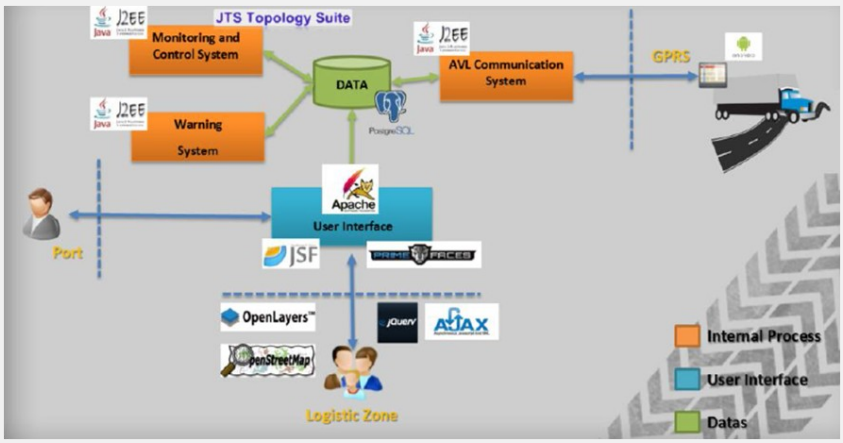

Figure 1. System components: Hardware & Software in Group B Manipulation Detection System.

This system has been integrated in a dashboard designed with a Business Intelligence platform, Pentaho (Figure 1). It gives the user the key performance indicators (KPIs) values to contribute to the decision making by managers. We used the Value Stream Mapping tool (VSM) and standards such as: ISO 9001 (about Quality Management Systems), ISO 14001 (about Environment Management Systems) and ISO 28000 (about Security Management Systems for the supply chain) to define the KPIs linked to the process of cargo transport from the port to the inland terminal.

The importance of having the appropriate data to support decision making and to optimize management in seaports is a fact accepted in an international scale. Ports play a key role connecting markets and thus need to be more efficient. Their efficiency is a key factor in the supply chain. The developments and implementations in this pilot are oriented in getting useful information for the port terminal managers to achieve this objective.

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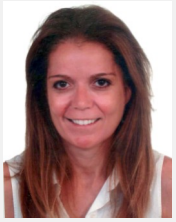
2nd International Conference

Geli Latsa, SEAbility Ltd.



The **INTE-TRANSIT: "Integrated and Interoperable Maritime Transit Management System"** MED project has achieved major accomplishments towards the goal of enabling multimodality and intermodality in large logistics hubs as are the MED port terminals.

After 3 years of leading innovation, the INTE-TRANSIT consortium successfully organised its final International Conference under the theme: "**Multimodality and intermodality as drivers of change for ports and logistics**", at Piraeus Chamber of Commerce & Industry, in **Piraeus, Greece.** During this unique event and showcase approximately 100 participants had the chance to find out more about the project's solutions, the new challenges that Ports and Logistics areas are facing and State of the Art developments. The event was co-organised by ICCS, SEAbility and PCT on **24-25 June 2015**.

The Conference was inaugurated by the INTE-TRANSIT project coordinator, Dr. **Angelos Amditis**, Research Director at ICCS/NTUA, while opening speeches have been delivered by Mr. **Miltiadis Provatas**, Director of Transport Strategic Planning and Mrs **Agkatha Skafida**, General Director of Ports, Port Policy & Maritime Investments, of the Greek Ministry of Economy, Infrastructure, Maritime & Tourism, Greece , Mr. **Zhang Anming**, Deputy General Manager Piraeus Container Terminal S.A. (PCT) , Mr. **Antonio Torregrosa Maicas**, Head of Projects at VPF, Mr. **Stefano Persi**, ALICE Technology Platform and Mr. **Ignacio Alvarez-Ossorio**, President of EUROPLATFORMS.

In addition, prominent speakers from academia, industry, European and national public authorities, and port operators as PCT/COSCO, VPF, APPA, IAT, SEAbility, CONATECO, AIA, VPF, ICCS among others, presented and discussed a variety of topics through five dedicated technical sessions and two round-table discussions. The key topics that were specifically addressed are:

- The challenges and drivers that MED ports are currently facing in order to turn into intermodal and multimodal hubs.
- The ICT and business analysis tools to assist the port operators interface more seamlessly with various stakeholders of the supply chain.
- The legislation and policy issues related to the logistics chain and how they may impact the strategic planning of ports.
- The issues of Multimodality and Intermodality for the supply chain.
- The different levels of automation which may significantly improve the internal processes in a modern ports and logistic areas.
- The new technological and organisational trends for Ports and Logistics.

In parallel, posters and demonstrations of the latest technological developments in the area of ports and port logistics have been also exhibited to the attendees.

Download the Conference programme here.

Presentations will be available at the INTE-TRANSIT website .

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News and events

INTE-TRANSIT 5th Training activity

June 23, 2015, Piraeus, Greece

The INTE-TRANSIT project organised its 5th Training activity under the theme: ***"Innovation in ports: towards a smarter and more sustainable net of ports in the Mediterranean Sea"*** in Piraeus, Greece, on 23 June 2015. This event was the last of a series of training activities organised during INTE-TRANSIT runtime so as to achieve the partners' goal towards the establishment of a cooperation framework between relevant stakeholders, to facilitate best-practice exchange, cooperation and training of personnel.

The basic objectives of this event were:

- To understand the innovation process in ports, from the detection of the opportunity to the new product, services or process, including the design process of the innovation strategy in ports aligned to the general port strategy.
- To understand the importance of the innovation process in ports as well as the role of ICT: key factors, business models and relationships, drivers, obstacles and solutions.
- To find out about real cases in ports concerning adoption of innovation: best practices learnt from the INTE-TRANSIT project and pilots: INTE-TRANSIT port container terminal management system & INTE-TRANSIT port – hinterland logistics management system.

The trainers were experts coming from well known companies and organisations as ICCS, IAT, APPA and SEAbility. The thematic areas that were addressed and thoroughly discussed during this training event were the following:

- Innovation Process and cycle – aligned with port strategy.
- ICT related innovations.
- Container Terminal Innovations with an energy & environmental impact.

Training presentations will be available at the INTE-TRANSIT website.

INTE-TRANSIT 2015 Dissemination activities

During the last months of the project duration partners made major efforts to disseminate project findings through related scientific publications and paper presentations in well known events. Specifically the following technical papers have been presented in 2015 conferences:

- *"Low cost – high accuracy yard equipment tracking for improved container monitoring and assignment"*, during the 21st International Conference on Urban Transport and the Environment, on 2-4 June 2015, in Valencia, Spain. Paper produced by ICCS, SEAbility and PCT partners.
- "*Monitoring and Tracing Systems in a Real Operative Environment of a Port Container Terminal",* at the International Maritime Transport & Logistics Conference (Marlog 4), 15-17 March 2015, Alexandria, Egypt . Paper produced by VPF, NOATUM and ICCS partners.
- "*The INTE-TRANSIT Management system: Utilising DGPS and RFID technologies for optimizing container tracking in port terminals*" during the 4th International Conference on Traffic and Transportation Engineering (ICTTE 2015), May 24-25, 2015, Madrid, Spain . Paper produced by VPF and ICCS partners.

A paper entitled: "*Open-source dashboards for optimizing MED port terminal logistics processes*" has been also accepted for presentation during the 19th International Congress on project Management and Engineering, on 15-17 July 2015 in Granada, Spain. The paper has been produced by IAT, ICCS and SEAbility partners.

In addition, an INTE-TRANSIT paper entitled "*Logistic Management Optimization in the Ports*" produced by IAT partner, will be published in the next issue of Business and Economics journal (USA Academic Star Publishing Company).

CONSORTIUM

FACTS

Identification number: 2C-MED12-05, ERDF

MED Programme

Axe 3: Improvement of mobility and of territorial accessibility

Objective 3.1: Improvement of maritime accessibility and of transit capacities through multimodality and intermodality

Duration: 1 January 2013 – 30 June 2015

Total cost: 1.834.201,98 Euros

Coordinator: Institute of Communication and Computer Systems

Website: www.inte-transit.eu

CONTACT US

Coordinator
Dr. Angelos Amditis
Institute of Communication and Computer Systems (ICCS),
E-mail: a.amditis@iccs.gr

Dissemination Manager
Mrs. Geli Latsa
SEAbility Ltd.
E-mail: adm@seability.eu

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