Interreg
EUROPEAN UNION
Danube Transnational Programme
DIONYSUS

Danube Ports Day 2022

Danube Port Digitization Strategy & Action Plan

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Werner Auer / Ennshafen Port

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DIONYSUS Project & Digitalisation

- Inland ports play an important role in IWT sector … - … significant impact of ICT technologies on cargo business … - … Danube ports have to prepare themselves to integrate digitalisation in their daily business in a step-by-step approach
- Status quo of Sea ports and Inland ports, results of a survey … - … internal needs of port authorities / solutions for the needs of harbour master … - … integrated solutions supporting port operations and interactions with port actors
- EU policy and legislative framework for waterborne transport digital transformation shows up various regulations / developments of RIS COMEX project … - … NAIADES 3
- Seaports in Europe (Rotterdam, Amsterdam, Hamburg, Antwerp, Barcelona, Valencia, etc.) are frontrunners in the digitalisation transformation … - … inland ports started later and need a special tailor-made approach / bottom-up development

From SWOT to Strategy

- SWOT analysis illustrates that the strategy for digitalisation in Danube Ports is based on a **strong process orientation and process ownership**
- **Shell-like approach** is very recommended as well as **step-wise** implementation with between steps of validation and feedback loops
- starting with the **core processes** of a port business in the centre and allows – if needed - enlargement and interconnections to other processes which are not in the centre of the core business or connections to other process owners who are not necessary in the ownership of the port authority itself (but may be in the ownership)

STRENGTHS

- Only (relative) few players in the port sector; this leads to an approach of tailor-made solutions (which will really work) and not to the usage of anonymous products from the market (which have even parts which are not useful/senseless)
- Ports are not spread over great distances, multi-sites - they are in a clear and closed area
- Tasks to be depictured for inland ports are in lower range of about 1000 p.a. and not 10000/100000 p.a.
- Clear legal frameworks do exist, which give alignment for the users of the software
- People involved in software usage are relatively few (“100 and not 10000”) > trainings are much easier
- …..

WEAKNESSES

- Working in the fields of (analogous) old technologies with a high percentage of heavy-duty techniques (robust systems, not in “sophisticated business”)
- Most staff comes from the “practical side” (blue color, robust, manual business)
- Manage several different languages; here English is not the common basis for everybody
- No clear process roadmap for port business with clear structure and defined interfaces, …. – different interpretations of “real port process”
- Process at all is under strong economic pressure and cost-squeezing is central; it is not possible to raise fees, … due to the installation of new techniques in the infrastructure
- Sector is quite narrow and economy of scale is no chance to reach payback in short time

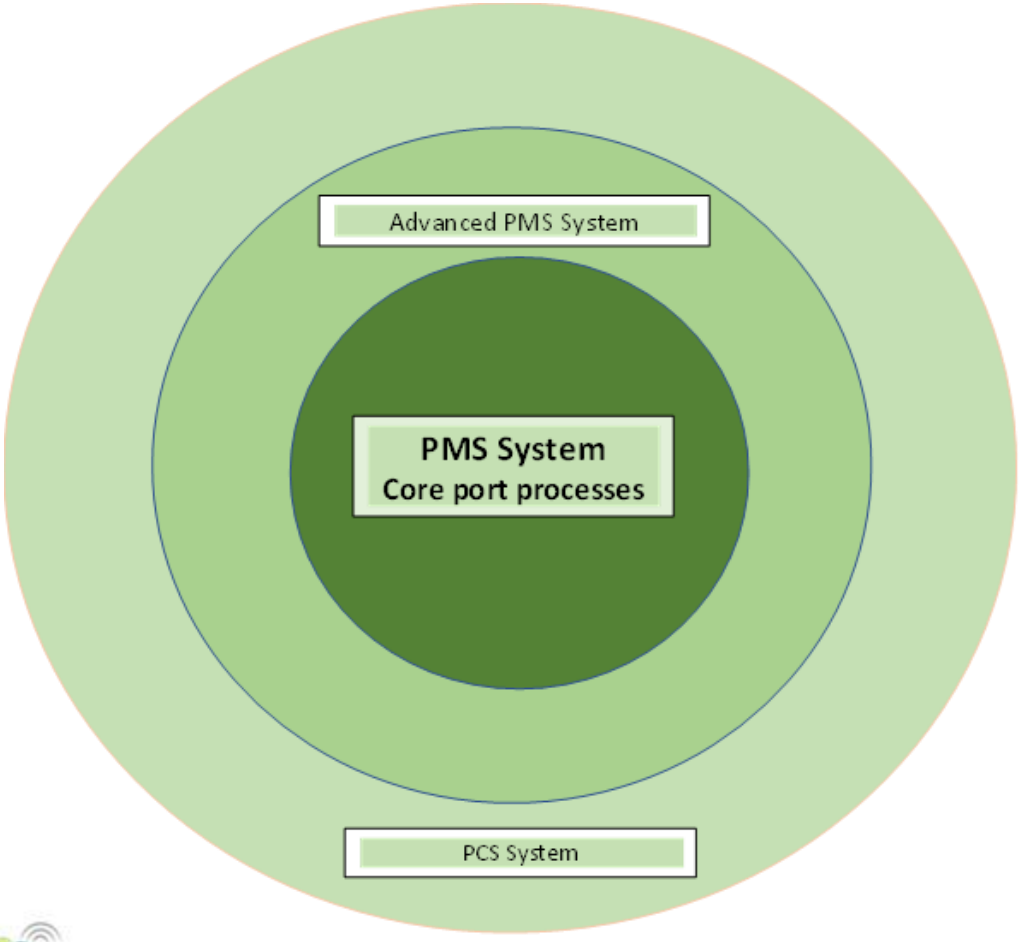
OPTIONS

- No frontrunner position in digitalisation market, so we don´t have to use digitalisation technologies, which are far developed (“standards”) and state of the art
- Clients are familiar with digitalisation products in other parts of their life, so there should be no great (mental) barriers to switch to new technologies (“advantage of the follower”)
- General software-developments on the market are really mature and support a step-by-step-approach and “puzzle-systems” for the ports; in/out interfaces are far developed and part of everyday life (mobile phone, apps, tablets, …), this allows a productive environment for the creation of new software solutions
- Other solutions do exist (other branches) which serve as good benchmarks, sources of knowledge for our approach

TREATHS

- Strong orientation on the solutions of seaports – there is a different business (and processes) in inland ports – instruments of seaports are not the right ones for inland ports
- Most of market solutions are focusing on container business, but we need the software solutions for other processes (container software still exists and is highly developed – but this is not the core port business, even if the terminals are situated within the port area)
- IT provider (of standard software products) may force us into the existing framework of their products, which are too huge/comprehensive/fixed on other processes / … and do not focus on our core processes
- Port business is very narrow, so in the market of external experts it is the same (or even worse) > no support of experts which really know the port business (like it is in other sectors with a broad field of knowledge outside the companies – e.g., rail, …) or they come with solutions which are not customer oriented (e.g. solutions for storage, billing, …) - but these are not port-specific > first serve core processes
- IWW-business is no big growing business on the Danube, this does not allow big investments

Strategy - „The Shell-Approach“



PMS – Port Management System

Core port processes:

- vessel management - waterside transhipment & berthing
- RIS-connections
- (drinking) water, electricity supply
- video survaillance system, other tracking systems (“digital twin”)
- fueling, customs of shiploads
- weather, temperature of water, noise measurements, other (water) parameters which have to be monitored (e.g., due to authority permission papers).

Advanced PMS System

- billing, statistics, financial & environmental balancing, …

PCS - Port Community System

Integration of Core port processes and other port processes

- cranes, trucks, logistic systems of rail, …
- storage and wider transhipment system within the port
- client systems (ERPs), production systems (jit), containers, …

Action Plan

Short-term

- **Each port** in the Danube region shall look for the best way – under the national framework – to realise the **first two shells** of the strategic approach in a **tailor-made form** due to national specifics. After this process every port shall have a planning concept / a stepwise realized solution for his own PMS - this has to be a tailor-made solution and shall deliver a **“digitalised harbour master book”** of common standard.

Recommendation: an international project can accompany this short-term step, in which the ports can exchange information and ideas or software solutions (in the sense of benchmarking or best practice), learn from each other and look for national software specialists which can be integrated into this approach, a common discussion about the “minimum international standard” of a state-of-the-art harbour book may support a quick realisation.

Action Plan

Mid-term and long-term

- Within the next steps of action, **the way from PMS to PCS** shall be done by items like the following (not only / must be checked in a tailor-made process by each port due to its special organisation and environment): digital transformation analysis, analysis of Danube ports digital capabilities, collection of best practices, analysis of other applicable ICT solutions and new technologies, Danube port's needs & technical requirements, port process management analysis, cost benefit analysis, technical specifications , legal aspects – governance, data processing & sharing, ownership, hosting, cybersecurity, national RIS-implementation progress
- By these steps the PMS will get more and more **connections with other platforms** and systems (if there is really demand for it and will bring added value).
- Furthermore – in the further long-term dimension - the development will **go into other shells of processes** which may comprise (depending on the detailed situation of a port): connection with other modes of transport (railway, road,…), connection with storage data or just-in-time cargo-flow data, connection with drones (under water drones …), connection with predictive maintenance, energy systems …

Action Plan

The red line for the whole process …

- Action plan on a bottom-up approach under the alignment of international information exchange and learn from each other
- Recommendation: **act local but think global** now and install a strong information exchange platform between ports (either by means of a special project or information days, best practice workshops or something else)
- The local approach may be organised on a national level or a group of ports within a country or stand-alone for a port – depends on regional specifics in countries (ownership, organisational factors, …)

First we need a digital PMS before going outside the core processes.

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DIONYSUS – Integrating Danube Region into Smart & Sustainable Intermodal Transport Chains