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DAPhNE

Guidelines on Human Capacity Building in Ports

Work Package 4

Activity 4.3

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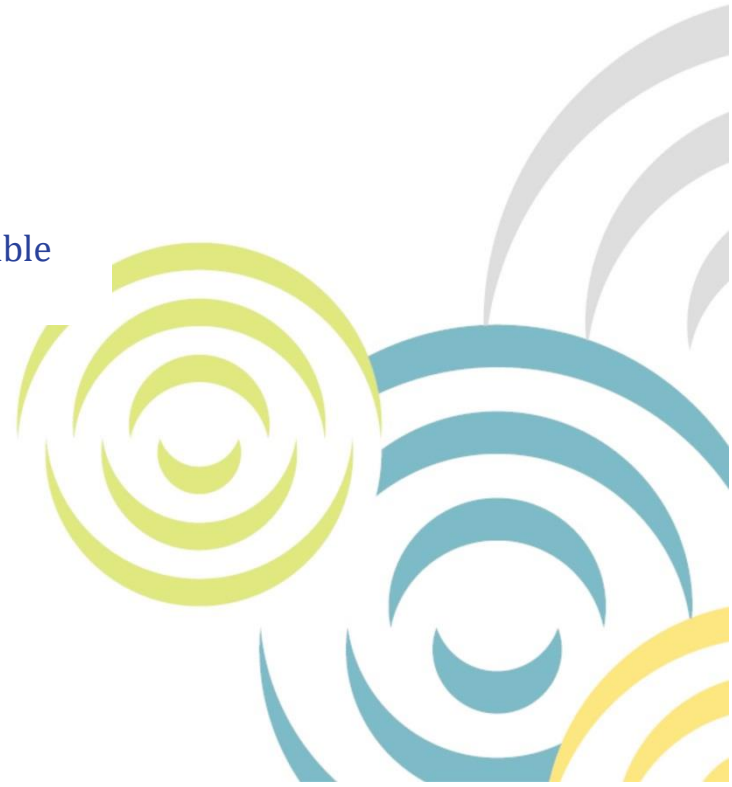

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D.4.3.1.	Status-quo report on HR in the Danube region	28.06.2018	FHOO
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D.4.3.3.	Best practices report on HR in ports	12.10.2018	FHOO
D.4.3.4.	National HR events (AT, RO, HU)	31.05.2018	FHOO

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1 Objective and description of report

For the last few decades, the focus of the port sector has been very much on technological advances that make productivity less dependent on human effort, knowledge and skills. However, recent years have witnessed a growing acknowledgement by the port industry that appropriate attention must also turn to performance improvement through skilled and motivated people. Ports should be seen as "socio-technical" systems because, in practice, operations in port terminals are carried out by a partnership between human beings and technology. This partnership, however, can only be successful if appropriate emphasis is given to human resource management and particularly the training component, an often over-looked area that can have a significant impact on port performance. For this reason activity 4.3 – "Human Resources Development" of the DAPhNE project focused on stimulating capacity building for inland ports resulting in a set of guidelines to ensure that the right people are working in the ports of the future.

This report was elaborated based on the results from the following Deliverables:

- survey conducted on the status quo on HR in the Danube region
- desktop research on funding sources for HR in the port sector
- best practice report on HR in ports
- 3 national HR events organized in Austria, Romania and Hungary

The main results of these Deliverables are summarized in this report. At the end of the document, recommendations for Human Capacity Building in Danube ports – based on the results of the mentioned Deliverables – will be presented.

2 Status Quo on HR in Danube ports

The survey on the status-quo of HR in Danube ports was conducted in inland ports situated in Austria, Hungary, Romania, Bulgaria and Croatia. Both, port authorities and companies situated in the port area of the respected ports are included in the survey to give a good overview of the status-quo of port employees in Danube ports. Project partners involved in the DAPhNE project, located in the different countries were responsible for conducting the survey in the different countries. It emerged from the survey that the results within the countries are often similar (especially with regard to the offered trainings) and that there are hardly any country-specific differences. Above all, the increasing age of the employees causes potential problems in the future in all countries and the shortage of qualified personnel. In addition, respondents mentioned that it is difficult to find qualified employees for the jobs in the different management levels. An interesting result was that respondents are hardly aware of funding sources for HR in the different countries or on European level. However, a desktop research conducted in parallel to this status-quo report showed that there are some funding sources on national and European level, which may be used by stakeholders. In the following chapters the main results are summarized on country level – detailed results are included in the status-quo report on HR in the Danube region.

2.1 Austria

In Austria three port authorities – port of Linz, Ennshafen and port of Vienna – and two companies located at the port – one at Ennshafen and one at the port of Vienna – participated in the survey.

Ports

In the following table, the topics on which training is offered at the port authorities are shown. Ennshafen port provides no specific training on the different topics due to its port management model (landlord) and the limited number of employees.

	Linz	Enns	Vienna
logistics (e.g. operation of logistical equipment)	yes	no	yes
administrative (e.g. IT training, accounting etc.)	yes	no	yes
social skills (e.g. communication skills, inter-cultural skills)	yes	no	yes
safety (e.g. safety training when using logistical equipment)	yes	no	yes
sustainability (e.g. trainings to learn about new environmental certificates or regulations)	no	no	yes
law (e.g. what are relevant topics concerning the legal situation)	no	no	yes

Table 1 - Trainings offered by Austrian port authorities

Companies

Currently the company from Ennshafen port does not offer any trainings concerning the topics related in the survey. The company from port of Vienna currently offers trainings in the area of logistics, administrative and safety. These trainings are held by colleagues and by the use of company equipment in a setting of a 6-month hands-on training for operational workers. For the management level, the company from port of Vienna organize a 3-month training.
The company also organize trainings on the topic of port operational tasks, because it is required from the company. The organization of such trainings takes one month, two trainings were organized in the past 3 years. On the topic of logistics the company from port of Vienna organize individual trainings for employees (only when they are required or when new employees are hired). However, the trainings will not be adapted or expand in the next years, because standard procedures are implemented.

	Enns	Vienna
logistics (e.g. operation of logistical equipment)	no	yes
administrative (e.g. IT training, accounting etc.)	no	yes

social skills (e.g. communication skills, inter-cultural skills)	no	no
safety (e.g. safety training when using logistical equipment)	no	yes
sustainability (e.g. trainings to learn about new environmental certificates or regulations)	no	no
law (e.g. what are relevant topics concerning the legal situation)	no	no

Table 2 - Trainings offered by Austrian companies

2.2 Hungary

In Hungary, so-called Port Authorities do not really exist, more precisely, the Ministry and the relevant legislative authorities are called Port Authorities. However, there are some port owners and public ports, which can be considered as "port authorities" which are owners or port managers of the National Public Ports or owners of other ports (with no 'National Public Port' title), three of these were involved in the survey, namely Port of Budapest, Port of Baja and Port of Adony.
Additionally five companies were involved in the survey in Hungary: Centroport Ltd. (Dunaújváros), Ferroport Ltd. (Budapest), RWA Hungary Ltd. (Baja), Áti Depo Zrt. (Baja), Concordia Közraktár Zrt. Business Unit in Fadd-Dombori (Fadd-Dombori). All of these companies are port operators or logistics service providers operating in a port.

Ports
The trainings offered by port authorities in Hungary are focusing on logistics, administrative issues, safety and sustainability. The ports do not provide trainings such as social skills or law.

	port 1	**port 2**	**port 3**
logistics (e.g. operation of logistical equipment)	no	yes	no
administrative (e.g. IT training, accounting etc.)	yes	no	no
social skills (e.g. communication skills, inter-cultural skills)	no	no	no
safety (e.g. safety training when using logistical equipment)	no	yes	yes
sustainability (e.g. trainings to learn about new environmental certificates or regulations)	no	yes	yes
law (e.g. what are relevant topics concerning the legal situation)	no	no	no

Table 3 - Trainings offered by Hungarian port authority

Landlord-type of port authorities usually do not organise trainings on port operational tasks, because port operators chose their employees and provide trainings for them themselves. Port of Adony offers such training because they find it necessary, as there are not enough candidates coming from the port industry. These are not formal courses, rather in-house trainings. The answering port authorities plan to expand their current training repertoire in order to increase the efficiency of work. Trainings at ports are organised annually or when employees require it or when new, employees are hired.

Companies

All companies offer trainings on safety to their employees, which is an annual training and it is not just necessary but also obligatory in the port operation.

	company 1	company 2	company 3	company 4	company 5
logistics (e.g. operation of logistical equipment)	no	yes	no	no	yes
administrative (e.g. IT training, accounting etc.)	no	yes	no	no	no
social skills (e.g. communication skills, inter-cultural skills)	no	no	no	no	no
safety (e.g. safety training when using logistical equipment)	yes	yes	yes	yes	yes
sustainability (e.g. trainings to learn about new environmental certificates or regulations)	no	yes	no	no	no
law (e.g. what are relevant topics concerning the legal situation)	no	no	no	no	no

Table 4 - Trainings offered by Hungarian companies

2.3 Romania

In Romania MPAC as port authority for the ports of Constanta, Midia, Mangalia, Basarabi and Tomis as well as the companies UMEX S.A. and COMVEX S.A. (both located at the port of Constanta) participated in the survey.

Ports

NC Maritime Ports Administration SA Constanta is a National Company to which the Ministry of Transport leased, under a concession contract, the maritime transport infrastructure belonging to the public domain of the state for administration purposes. It manages and acts as port authority in the ports of **Constanta, Midia, Mangalia, Basarabi, and Tomis**. All these ports were taken into account for the present analysis, and MPAC has the role of port authority

for all them. Constanta is both a maritime and a river port. From its position, it aims to offer a developed transport infrastructure, as well as security, safety and environmental port conditions. Only the port operators are involved in transshipment, loading/unloading and other operations related to goods. MPAC assures training services to its staff, in every domain (financial, commercial, legal, administrative, technical, human resources a.s.o.), being aware about the importance of well-trained staff which leads to higher performance level for the entire port and city. MPAC does not encounter problems in finding qualified employees. When it comes to its employees, MPAC currently organizes trainings in many areas, described below:

	port 1
logistics (e.g. operation of logistical equipment)	yes
administrative (e.g. IT training, accounting etc.)	yes
social skills (e.g. communication skills, inter-cultural skills)	yes
safety (e.g. safety training when using logistical equipment)	yes
sustainability (e.g. trainings to learn about new environmental certificates or regulations)	yes
law (e.g. what are relevant topics concerning the legal situation)	yes

Table 5 - Trainings offered by Romanian port authority

Companies

In Romania, two companies were involved in the survey: UMEX S.A. and COMVEX S.A., both companies are located at the port of Constanta.

	company 1	**company 2**
logistics (e.g. operation of logistical equipment)	yes	yes
administrative (e.g. IT training, accounting etc.)	yes	no
social skills (e.g. communication skills, inter-cultural skills)	yes	no
safety (e.g. safety training when using logistical equipment)	yes	yes
sustainability (e.g. trainings to learn about new environmental certificates or regulations)	yes	no
law (e.g. what are relevant topics concerning the legal situation)	yes	no

Table 6 - Trainings offered by Romanian companies

2.4 Bulgaria

In Bulgaria three ports participated in the survey, namely Ruse-west operated by the Bulgarian Ports Infrastructure Company (BPI Co.), Lom operated by Port Invest Ltd. and tRuse-east operated by Port Complex Ruse (JSCo.). Also questionnaires were received from one ship agent, one company forwarder, ship agent and ship owner, working in almost all river ports in Bulgaria and one forwarder, working also in the field of automobile transport.

Ports

In the following table, the trainings offered by the different port authorities in Bulgaria are summarized.

	Lom	Ruse-west	Ruse-east
logistics (e.g. operation of logistical equipment)	yes	yes	yes
administrative (e.g. IT training, accounting etc.)	no	yes	yes
social skills (e.g. communication skills, inter-cultural skills)	no	no	no
safety (e.g. safety training when using logistical equipment)	yes	yes	yes
sustainability (e.g. trainings to learn about new environmental certificates or regulations)	no	no	no
law (e.g. what are relevant topics concerning the legal situation)	no	no	yes

Table 7 - Trainings offered by Bulgarian port authorities

Companies

	Company 1	Company 2	Company 3
logistics (e.g. operation of logistical equipment)	no	no	no
administrative (e.g. IT training, accounting etc.)	no	no	no
social skills (e.g. communication skills, inter-cultural skills)	no	no	no
safety (e.g. safety training when using logistical equipment)	no	no	no
sustainability (e.g. trainings to learn about new environmental certificates or regulations)	no	yes	no
law (e.g. what are relevant topics concerning the legal situation)	no	yes	no

Table 8 - Trainings offered by Bulgarian companies

The employees of the interviewed companies **do not work with logistical (loading/unloading) equipment** and no training is foreseen in this field.

2.5 Croatia

In Croatia the Port Authority Vukovar and two port operators – Luka Vukovar d.o.o. and VUPIK d.d. – participated in the survey.

Port

Port Authority Vukovar as a public institution isn't in charge to offer trainings.

	Port of Vukovar
logistics (e.g. operation of logistical equipment)	no
administrative (e.g. IT training, accounting etc.)	no
social skills (e.g. communication skills, inter-cultural skills)	no
safety (e.g. safety training when using logistical equipment)	no
sustainability (e.g. trainings to learn about new environmental certificates or regulations)	no
law (e.g. what are relevant topics concerning the legal situation)	no

Table 9 - Trainings offered by Croatian port authority

Companies

Luka Vukovar d.o.o. and VUPIK d.d. currently don't organize any training on the topic of port operational tasks because at this moment they don't need such trainings. Both organizations Luka Vukovar d.o.o. and VUPIK d.d. preferred to organize training on the topic of logistics at the group level. About offering frequency for trainings, Luka Vukovar d.o.o. provides trainings on semi-annual basis, while VUPIK d.d. provides it when employees require and when new employees are hired. In the next year Luka Vukovar doesn't plan to expand current training on the topic of port employees, while VUPIK d.d.is planning because there are new possibilities for work.

	port of Vukovar
logistics (e.g. operation of logistical equipment)	No
administrative (e.g. IT training, accounting etc.)	No
social skills (e.g. communication skills, inter-cultural skills)	No
safety (e.g. safety training when using logistical equipment)	Yes

sustainability (e.g. trainings to learn about new environmental certificates or regulations)	No
law (e.g. what are relevant topics concerning the legal situation)	Yes

Table 10 - Trainings offered by Croatian companies

2.6 Future development of Danube ports

In addition to the evaluation of the status quo, the future development of Danube ports was also evaluated. This has been done in two ways: Within the questionnaire, respondents were asked about their opinion concerning the future role and challenges of Danube ports and its effect on training of port employees. This was done by using a Likert-Scale ranging from 1 (very high) to 5 (very low). Furthermore, workshops with stakeholders were organized in Austria, Hungary and Romania in order to generate possible profiles of port employees of the future in different hierarchical levels.
The effect of the trends on training of port employees mentioned in the following table was also evaluated in the survey. These trends are currently relevant in the field of logistics in general and thus are also relevant for training of employees in ports, since ports can be seen as important hubs of logistical networks.

	Austria	Hungary	Romania	Bulgaria	Croatia
new multimodal transport concepts (e.g. Synchromodality, Physical Internet,…)	3	4	2.5	3.2	3.7
technological developments of logistics equipment and means of transport (e.g. alternative fuels,…)	2.5	4	3	3.5	3
digitalization	3	3	3.5	2.5	2.3
internationalization of transport	3	3	3.5	3	2.3
new business models (collaboration with competitors or other companies)	3	3	3.5	2.7	2.3
sustainability	2	4	3	2.3	2.3
increasing importance of safety (for human and transport)	1.3	4	3	1.8	2.3

Table 11 - Effect of trends in field of logistics on training in ports

As can be seen from the table, the impact of emerging trends has been evaluated almost identically by the involved countries. The only significant difference is in the field of increasing importance of safety.

For the future training of port employees, it is important to include currently and future relevant topics to make sure that employees are equipped with the required knowledge for the future. Possible next steps could be to initiate one-stop-shops for logistic services. One Austrian port authority mentioned that ports have to turn to other businesses besides logistics

to finance the maintenance of the very expansive infra- and superstructure. Just in that case, ports will become even more interesting employers. A port is an institution and should be preserved in its bi- or trimodality.

The port of Vienna mentioned several challenges in the survey; a port has to cope with in future times to be a competitive logistic hub:

- Combine traditional, historically grown logistics infra- and superstructure with modern logistics trends – logistic 4.0, physical internet
- Can a port with the classic port business survive or should he turn to other industries?
- Regulations and interventions in inland navigation
- Cooperation between Seaports and Hinterland Ports
- The new Silk Road (New Businesses, New traffic routes)
- City Logistics – Ports as city logistics hubs
- Fulfillment of the EU Regulations in the future

In Romania, the development of the Danube Ports depends on ensuring constant navigability conditions of the Danube and the development of the integrated system of transport, by reducing the number of transshipment and choosing the most advantageous mode of transport, and ultimately an economic route. Increasing the efficiency of waterways can be done if they are assigned more functions. In addition to shipping requirements, waterways can also be used to meet the requirements of irrigation, water supply, drainage, power generation, flow regulation, tourism, etc.
In addition, next steps are that the navigability of the Danube on the Serbian/Romanian/Bulgarian sector must be increased, controlled and better administrated, and the investments on the lower sector of Danube must be completed.

In Hungary, companies mentioned that due the increasing importance of sustainability, inland waterway transport and thus ports as important transport hubs facilitating the use of this transport mode should be politically promoted. Investments in infrastructure (e.g. to enable data exchange between different stakeholders) are necessary to guarantee competitiveness of inland ports in the future. In addition, further companies should be attracted to ports as economic centres, which can use inland waterways for transport. Trends such as digitalization are also affecting ports and the training required for future employees. Thus, specialized training should be offered for future employees. Another important issue, which should be addresses in the future, is to guarantee full navigability of the Danube river to make sure that inland vessels can operate fully loaded. As a result, also ports can be seen as important hubs in the transport networks.
In Bulgaria comments include that ports will keep their reputation of reliable and correct employers. One of the respondents states (similar to Romanian and Hungarian partners), that a challenge for Danube ports to be competitive logistics hubs in the future is improvement of the navigation route and maintaining the needed river depths. The lack of sufficient investment in new services is also seen as a challenge.

2.7 Summary of results

A total of 11 ports participated in this survey, these 11 ports are located in five Danube riparian countries:

- Austria
  - Port of Linz
  - Ennshafen port
  - Port of Vienna
- Hungary
  - Port of Budapest
  - Port of Baja
  - Port of Adony
- Romania
  - Constanza port and satellite ports Midia, Mangalia, Tomis and Basarabi
- Bulgaria
  - Ruse-west
  - Port Lom
  - Ruse-east
- Croatia
  - Vukovar Port

The number of employees in port authorities in the mentioned ports and countries surveyed varies between 8 (Austria) – 911 (Romania) employees. This may be explained by the different port management models, which are applied to the different ports. For example a landlord port may not need as many employees as a public or private port.

The survey also indicates that there are still more male than female people employed in the area of ports. The received data also show that the age of employees working in the port area is relatively high - there are only a few people under the age of 20, but the majority of people over 50 years which are working in this business sector. This shows that the current workforce is getting older and in some years there will be problems due to retirement of employees and additional workforce will be necessary. For this reason, it is increasingly important to promote the location of a port for young people as an attractive workplace.

Another result of the survey shows that the majority of port employees have a school-leaving qualification, except in Croatia, in which case most of the staff have an academic degree. From this, it can also be deduced that the training on port issues should be more included in schools and advertising for jobs in ports should be made in schools. Furthermore, topics should also be addressed to make the job and training for women more attractive. In principle, it would also be desirable to standardize trainings for jobs in ports. Concerning the offered training, especially in Austria, Romania and Bulgaria, trainings for employees are offered in all areas or at least in almost all areas (mentioned in the survey). The port in Croatia, however, currently offers no trainings in the requested areas. Training and further education is handled very differently in all countries/companies, which took part in this survey (except for safety).

Furthermore, there is currently no standardized procedure for continuing education. Although internal training program is not standardized and has not been clearly defined, it becomes clear that every authority or company has certain practice established. Training courses are usually held upon request of the employees. With regard to funding sources, few specified funding sources are available for port employees.

The survey shows that a lot of different (differ not only in their size) companies conduct their business in the surrounding of the port area. The most companies, which are located in the area of a port, are specialized in logistics, trade, construction materials or fuels.
This is because ports offer a wide range of services for example warehouse logistics, warehousing, bonded storage, multimodal cargo handling, car terminals and container terminals. In several ports, the wide array of services is complemented by the development of new commercial sites, like passenger ports or project development offers. Most ports operate as multimodal hubs. In other words, cargo can be handled in combination by road, rail and water.
The companies situated in the port believe that the economy will provide them with new opportunities. Furthermore, companies situated in the port expect these developments to become increasingly important for their own business. Regarding the responding companies, which are based at the port area or have a cooperation with one of the interviewed port, the following findings could be collected: The size of the companies, included in the survey, varies between 8-550 employees. These differences arise from the fact that not all companies located at ports are surveyed and only a limited number of companies were included.

One outcome was that the employees are mostly male, and the average age is between 36-50 or even over 50 years, for employees in port-based companies. Employees under the age of 20 or between 21 and 35 years are a rarity. Therefore, it will be increasingly important in the future to promote the port and the general logistics industry as an attractive workplace and to improve the image of the industry. The educational level of employees varies greatly among the companies, which completed the survey. Regarding further training for employees, the conclusion can be drawn that these are hardly available in the companies. In Austria, Hungary Croatia and Bulgaria for example only a few of the listed trainings are offered - logistics, administrative and safety are the most mentioned trainings. Furthermore, respondents in the survey were hardly aware of funding sources for training of port employees.

3 Funding sources for training

Port authorities and companies were also asked if they are aware of any funding sources for training measures in ports. These funding sources are important to guarantee that financial resources are available to train the people in ports as required. The results are summarized in the following table. In addition, a desktop research was carried out by project partners to identify funding sources for port employees and also educational institutions, which provide training on the topic of port management or a familiar topic (D.4.3.2 List of EU funding sources for HR). The results of the desktop research are also available on the project website.

	funding sources	**relevant topic**
Austria	the survey revealed no results	the survey revealed no results
Hungary	Currently, there are no funding sources in Hungary, which would support trainings in the port sector. More financial support would be needed for trainings in port operation, port management (incl. port strategy, lean management), as well as crane, forklift, front loader, truck driver. Also, development of IT and language skills would be relevant topics to be funded.	the survey revealed no results
Romania	Port School Foundation http://scoalaportuara.ro/	Supporting and organising professional training, to assist port workers, unemployed, trade union members and other applicants by organizing training courses in port-specific jobs, as well as in jobs not related to the port.
	Romanian Intermodal Association http://www.ria.org.ro/ria/index.php?option=com_contact&Itemid=83	Development and delivery of professional programs for personnel working in intermodal activities in order to promote new professional competencies; supporting and organising professional training, qualification and requalification directing the labour force for its members and for all categories of solicitors
	MPAC – own sources www.portofconstantza.com	Training programs, attending courses organized by the employer or by the providers of vocational training services; professional adaptation stages to job; internships and specializations;

		individualized training a.s.o. are performed with the purpose of adapting the employee to the requirements of the job, obtaining a professional qualification; updating the specific knowledge and skills of the post and the workplace and improving the vocational training for the basic occupation; acquiring advanced knowledge, modern methods and procedures necessary for carrying out professional activities etc.
Bulgaria	Operational Program "Human resources development 2014-2020"	- health and safety; improvement of working conditions
	Own funding of port authorities/port operators/companies, etc.	port logistics; training courses for port workers in order to their professional duties
Croatia	the survey revealed no results	the survey revealed no results
EU	APEC is the port training centre of Antwerp and Flanders, that offers short-term seminars to professionals from all over the world. https://apecporttraining.com/	Port logistics Port environmental policy & technology Dredging technologies Port management Port business development & marketing etc.
	European Commission http://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020/romania/2014ro16rfop001	Competitiveness Operational Programme (POC); Promoting investment in R&I, developing links and synergies between businesses, research and development centers and higher education: Action 1.1.4: Attracting staff with advanced skills from abroad to strengthen R&D capacity; Improve research and innovation (R&I) infrastructures and capacities to develop excellence in R&I and promote competence centers, especially those of European interest, by linking them to existing or emerging clustering structures that aim at innovation and economic development: Action 1.2.3: Knowledge Transfer Partnerships

	INTERREG http://www.interregrobg.eu/ro/	(Interreg V-A) Romania-Bulgaria Programme: The cooperation programme is structured across five priority axes: (1) A well-connected region; (2) A Green Region; (3) A Safe Region; (4) A region with qualified and inclusive people; (5) An efficient region. The priority "A region with qualified and inclusive people" addresses measures to encourage the integration of the cross-border area in terms of employment and labour mobility.

Table 12 - Funding sources for training in ports

In addition, respondents were asked for what type of training they would need more financial support from public funding sources. Respondents (companies and port authorities) mentioned that they would need funding for the exchange of experience in foreign institutions (e.g. to get funding for a study visit in another European country) and for specialised training on topics such as port logistics, port management, legal aspects in port operations, dredging technologies, port environment policy & technology or marketing. In addition, trainings on the topic of sustainability or other topics, which are very specific and which cannot be seen as core competences of ports, are required.

4 Best Practice Examples

The best practice examples identified from project partners from Austria, Hungary, Romania, Bulgaria and Croatia as well as the examples from other European countries evolved from desk research. Overall there are 22 best practices all over Europe ranging from universities to Associations of port authorities.

4.1 Europe

Duisport

The Port of Duisburg is the largest inland port in the world and the leading logistics hub in Central Europe (called Duisport). Within a radius of just 150 kilometres, 30 million consumers are located. More than 20,000 ships and 25,000 trains are handled each year. In total around 1150 people are employed at the Duisport and generate a turnover of around 230 Mio Euro.

INeS Danube

INeS Danube is an e-learning platform open to all interested at www.ines-danube.info. It provides a modern form of education in the field of logistics on inland waterways in the Danube region with particular reference to intermodality. The platform caters to the needs of different target groups, whether pupils or students of educational institutions focusing on logistics, practitioners like shipping companies or the manufacturing industry. Other INeS e-learning platforms focussing on other European regions can be found on http://www.ines-danube.info.

EFIP

EFIP is acting as the unique voice of inland ports in Europe. It highlights and promotes the role of inland ports as nodal points for intermodal transport, combining road, rail, maritime and inland waterway transport.

EFIP actively follows all developments in the field of EU transport and environmental policy of importance to inland ports and their environment, and represents the inland ports to the European institutions. EFIP also represents the inland ports to other national and international organisations that are dealing with transport, such as the Economic Commission of the United Nations for Europe, and the Central Commission for the Navigation on the Rhine and the Danube Commission. In this regard, EFIP presents common positions on European policy issues of importance for inland ports and their economic and business environment.

SPC

As a neutral, non-profit consultant, the SPC develops detailed, multi-modal logistics concepts on the traffic systems rail, waterway and short sea shipping. Our concepts can be implemented immediately. As a neutral supplier, we are happy to share our knowledge about multi-modal logistics concepts. The SPC supports you with expert information and education opportunities. The SPC welcomes every ally and actively supports you. We send our own speakers to your event or establish contact to other speakers, provide impulses and support you with expert information. Furthermore, we participate in trade fairs and exhibitions with our partners.

ISL

The ISL - Institute of Shipping Economics and Logistics founded in Bremen in 1954 combines tradition with modern science; we have since positioned ourselves as one of Europe's leading institutes in the area of maritime logistics research, consulting and knowledge transfer. On behalf of our project partners from the public and private sector, both on national and international level, we ensure that innovative ideas become solutions with practical applicability. At our offices in Bremen and Bremerhaven, we handle projects from all over the world in interdisciplinary teams.

Port of Rotterdam

The port of Rotterdam is Europe's largest seaport. The port owes its leading position to its outstanding accessibility for sea-going vessels. In addition, to its intermodal connections and the 180,000 people working in and for Rotterdam's port and industrial area. A place where unlimited ambitions can become reality.

Quinwalo

Quinwalo is a series of courses organised by the Schifferbörse Duisburg-Ruhrort e. V. The objective is to raise the awareness for the advantages and chances of the inland vessel. It focuses on the transfer of competences and skills reagarding inland navigation and waterways in the training of merchants for forwarding and logistics services.

STC Rotterdam

The STC is an educational and reserach institute for the shipping, logistics, transport and port industries and operates worldwide. The STC offers business courses and training for professionals. STC Group participates in international activities and has offices in the Netherlands and abroad. The headqaurter of STC is located in mainport Rotterdam.

4.2 Austria

REWWay

The competence center on inland navigation REWWay (Research and Education in Inland Waterway Logistics) is part of the Logistikum. The Logistikum in Steyr, Austria, is the research- and education institute of the Upper Austrian University of Applied Sciences in the field of logistics. Goal of REWWay is to integrate inland navigation (with a focus on Danube navigation) into logistics education and training to raise acceptance of the Danube as environmentally friendly way of transport. Interactive workshops are organized on national and international level including game elements (e.g. games on tablets) to teach participants about inland waterway transport and the important role of ports as facilitators for a modal shift towards this transport mode. In addition, on the REWWay website learning materials and exercises are available free of charge. The goal is to make the different stakeholders (e.g. students or stakeholders from industry) aware of the sustainable transport mode inland waterway in order to achieve a modal shift.

4.3 Hungary

Port Management Training

Main goal: Training for professionals to have a common level knowledge and skills to operate and manage ports. Before launching the training at the university, there had been no such studies at all in Hungary. The training program consisted of theory, polymedia and practice. Theoretical sessions were taken place at the University of Dunaújváros and the practical courses were at ports of Budapest, Dunaújváros and Baja.

4.4 Romania

'Mircea cel Batran' Naval Academy

- Higher education institution having engineering & polytechnic profiles, who prepares officers - Engineers for the Naval Forces, Border Police and Commercial Navy, through bachelor and master studies
- Research, Development and Innovation in Naval Engineering through Inter-institutional collaboration of teachers and students

Constanza Maritime University

Navigation and Maritime and River Transport Faculty's objective is to ensure an educational and scientific environment which stimulates intellectual development and gaining certain professional competencies at international standards.

Maritime Ports Administration Constanta

Port authority interested in adapting its employees to the requirements of each job carried out for the Port Administration, obtaining a professional qualification; updating the specific knowledge and skills of the post and the workplace and improving the vocational training for the basic occupation; acquiring advanced knowledge, modern methods and procedures necessary for carrying out professional activities etc.

The Merchant Marine Training Centre

The CCEMMP is established as a public institution offering vocational education and training requirements of merchant marine personnel, those certifying the highest level of trainings provided by CERONAV. The high training standards are supported by CERONAV's affiliation to following international professional organisations and associations: International Association for Safety and Survival Training; International Association of Ports and Harbours; International Maritime Lecturers' Association BIMCO; Intelligent Transport Systems; Romanian Intermodal Association; Nautical Institute; EDINNA – Education in Inland Navigation – Association of IWT Education and Training Institutions

PSF

The non-profit institution 'Port School Foundation' which is supporting and organising professional training, to assist port workers, unemployed, trade union members and other applicants by organizing training courses in port-specific jobs, as well as in jobs not related to the port.

R.I.A

Supporting the development of its members activity by representing, promoting, supporting and protecting the association members interests in relationships with the public authorities, the unions, physical and legal persons, and the relations between them; promotion centre within the European centres net of intermodal transport promotion, acting as a logistic centre between naval, highway and railway transports; proposing to competent authorities and sustaining laws, reglementations, technical and administrative measures in order to develop the intermodal transport; Encouraging and promoting the best standards of professional qualification, competence and knowledge for the personnel involved in the specific activities; etc.

Ovidius University from Constanta Mechanical, Industrial and Marine Engineering Faculty

The bachelor (Naval Architecture-Ship systems and equipment, Port and Marine Installations and Equipment, Economic engineering in the mechanical domain) and master (Engineering of Advanced Naval Systems and Equipment, Optimization of Port Technology and Machine Operator, Engineering and management of production systems) programs offered are, each on a clearly defined specific basis, starting points for good professional training of the graduates, so that, through their knowledge, skills and abilities, they are able to respond

successfully the severe conditions of preparation and performance required in the area of major economic agents, such any Shipyard in the world.

4.5 Bulgaria

SAP ERP 6.0 Elaboration and implementation of an integrated information system within BPI Co.

Bulgarian Ports Infrastructure Company (BPI Co.) manages the port infrastructure of the public transport ports of national importance and provides traffic management and shipping information services. Object of activity and status of BPI Co. are regulated by the Maritime Spaces, Inland Waterways and Ports of the Republic of Bulgaria Act. Furthermore the Company assures adequate courses and constant training for its personnel including within cooperation on international level.

Port Comples Ruse JSCo.

Port Complex Ruse is the operator of the biggest river cargo port in BG - Ruse-east. The company assures constant training of its own personnel and collaborates with the educational institutions by providing internships and study visits for students.

Training Center to the NSBS

NSBS provides educational courses to all interested parties. Their objective is to implement national and international standards and good practices for all modes of transport.

4.6 Croatia

Faculty of Transport Sciences, Institute for Waterway Transport

Department for technics and technology of water transport

Inland Port Authorities Association

Association of inland ports authorities in Croatia

Combined ports (sea & inland shipping) have better training offered than pure inland ports. This may be because of the higher volume handled in seaports and the higher amount of employees needed at port authorities (Ennshafen: 8 employees; MPAC: 911 employees)

5 National HR Workshops

Three workshops have been organized in Austria, Romania and Hungary in May 2018 with experts in inland shipping respectively inland ports. The aim was to better assess the needs and expectations of potential employees by generating a picture of the port of the future and its employees. The workshops were organized in different sessions with various topics in order to gain insights in the perceived evolution of ports and port employees. Following, the workshop outputs are summarized per country and the results of the survey regarding the port employee of the future are shown in Table 14.

5.1 Austria

After key notes, held by FH-Prof. Mag. Dr. Oliver Schauer, MBA (University of Applied Sciences Upper Austria) and Alexander Till, MBA (Port of Hamburg), participants were divided in three equal groups to allow discussions in small groups. A Future Transport Lab – consisting of three stations – was organized. Each group had 20 minutes at each station to discuss the following topics:

- **Ports as the engine of economy** – participants elaborated a business model for the inland port of the future (year 2040) using the Business Model Canvas approach. The main markets, target customers and main services of ports in the future were discussed.
  Results show that ports will still have their "basic" function as logistics service provider but in the future **further services will be provided by ports** to be competitive. New businesses will use ports for transhipment or as a location for a subsidiary (ports will become important economic sites).
- **Multimodal transhipment hubs of the future: ports in the eye of the Physical Internet** – participants discussed the level of digitalization of inland ports and inland waterway in general. In addition, reasons for sharing/not sharing information in the sector were discussed. In the course of a discussion, the participants of the session were asked to assess how the collaboration of the actors in the logistics sector will change in the future. In summary, it can be said that all participants agreed that in the future of transport actors will (have to) **become digital and collaborative**. However, the participants also see the existing media such as mail or telephone in the future still in use, especially when it comes to non-standardized processes such as communication with customers (after sales, etc.), in order to maintain direct customer contact. Future media, which are supposed to automate the communication, are seen above all for recurring, standardized processes. The extent to which these media will open up has not been determined in part because "we still cannot imagine what technologies will be available in 22 years". In addition, participants were asked: "Are you willing to share relevant data or make it available to ensure a collaborative environment?" This question was asked to all participants regardless of their professional background that the exchange of relevant data from all participants of the system is inevitable for the emergence of a common, efficient transport system. The participants had the task to make a "yes or no statement" and justify it. Participants were dissatisfied in answering this question and it boiled down to everyone agreeing on the importance of data sharing, but the distrust of the other participants in a data network and distrust of the technology prevailed. A strongly discussed argument was, for example, that culture in

companies speaks against collaborative data exchange, as corporate data is currently a big secret of individual companies. The majority of the evaluations were not clearly in the "yes" or "no" area, as the view was expressed that the actors must be shown in advance (possibly through pilot projects) the benefits of collaborative interaction between the actors, otherwise the mistrust just described, hardly anyone will get involved. It emerged that the task is to make the benefits tangible and to provide results from pilots. This would give the actors security about the functioning of the technologies and reduce distrust in the technologies and the actors (through demonstrated data security associated with functioning technology) and encourage logisticians to participate in such a collaborative system.

- **Ports as diversity hubs** – the topic of diversity (age, gender…) were discussed in the context of ports. Who will work in ports in the future? The results of this station can be summarized as follows: New trends and developments not only influence the technology concepts, but also the human factor behind them. The station "Harbours as diversity hubs" showed that social diversity in the working environment of people in the workplace is currently playing an important role and will continue to play a major role in the future.

The following statements summarize the main results of the Austrian HR workshop:

- education and training is an essential element in all areas; education level must be adapted; special skills will become more important in the future
- the existing occupational profile must be adapted and the occupational field itself must be made more attractive
- social skills will be increasingly important in the future
- lifelong learning is in the foreground → competence development and lifelong learning are of increasing importance
- knowledge is an important source of competence and sharing knowledge across generations
- achieving stable employee development will be more difficult; this is where companies and the economy are in demand
- a degree of personal responsibility is expected
- working conditions change: more flexibility and work-life balance more important!

To be able to meet these demands a number of measures for different target groups were defined by participants, to make sure that the inland ports of the future can be “realized” and that the people required in the future are trained accordingly:

Target Group	Measures
Education	• job profiles in the port should be more attractive (also by politics and economics) • requirements for jobs should be adjusted accordingly • adapt education to the new / changed jobs in the port • also adapt training of adults and lateral entrants

	• integrate technology into training • integrate topic of ports into geography / business education • adapting logistics training (offer specialization - extra focus / training would be too much, target group must be estimated)
Economy	• realize changes through subsidies (for training, new infrastructure) • willingness to cooperate (create win-win situations) □□new business models • legal security necessary in the future • promote cluster formation in ports (use synergies) □□could be also important in terms of training, to provide standardized training
Politics	• communicate changes in already existing and new job profiles • create a framework for education (for young and old) • transport policy measures to effect a modal shift (promote rail and waterway) – ports as important transhipment sites • infrastructure measures are necessary • subsidies (infrastructure) by federal government (transfer by financial incentives) • spatial planning policy / business settlements (ecoplus) →clusters should be promoted to benefit from economies of scale
Research	• analyse new business models / cooperation models → to encourage transhipment to rail / waterway in inland ports • develop logistics index - which criteria are important to look at in the future, how to measure and compare them, define measures based on results • provide results to all (publically available results) • practice-oriented projects (less theoretical) - integrate ports / business in project

Table 13 - Measures on Target Group level

5.2 Romania

The workshop in Romania also started with two keynotes held by Professor Diane Paula Corina Vancea, PhD. (Faculty of Economic Sciences) and Associate Professor Mirela Cotrumba, PhD. (Faculty of Mechanical, Industrial and Maritime Engineering).
The two key notes speakers presented the present status of the workforce in ports and the challenges faced by the Romanian ports as starting point of the workshops during the day. After the keynotes the participants where organised to three Round Table Sessions.

1. **Digitalization in ports** - Lecturer Alexandru Bobe, PhD. (Faculty of Mathematics and Informatics), and Associate professor Lucia Melnic, PhD. (Faculty of Mechanical, Industrial and Maritime Engineering)

2. **Diversity in Logistics**- Lecturer Alexandru Bobe, PhD.(Faculty of Mathematics and Informatics) and Associate professor Lucia Melnic, PhD. (Faculty of Mechanical, Industrial and Maritime Engineering)

Both moderators organized two debates showing a strong interconnectivity between the digitalization process and the diversity in logistics as important factors influencing the functioning of the ports and the development of the human resources. Concepts as industry 4.0 and logistics 4.0 cannot be ignored when we set up strategies for the development of the human resources in ports, in the future. The discussions were concentrated on the impact of the changes (due to the

digitalization) on the professional profiles of different types of jobs in the ports, the radical shift to automatization in the logistics and the impact on the future of human resources in the ports.

3. **Port of the Future** – moderator Lecturer Constantin Ilie, PhD. (Faculty of Mechanical, Industrial and Maritime Engineering)

The moderator presented and invited to a debate on the characteristics of the port of the future without long and heavy processes and how some solutions for the present issues of ports will impact the development of the human resources (fully automated container handling point-to-point, automated lorries picking up and dropping off containers, virtual port gates allow automated entry and exit, paperless freight and customs documentation, electronic security seals, verification and tracking for containers, automated submersible and surface craft (digital dolphins) for harbour and quay inspections, automated flying vehicles for crane and terrestrial port inspection, dynamic, real-time scheduling for ports and motor freight operators). One of the conclusions of the round table was that, in order to be able to offer qualitative professional training for those who will work in ports in the next 20-30 years, the educational institutions need to permanently adjust their curricula to new realities.

5.3 Hungary

In Hungary, the workshop started with three keynotes, held by Capt. Béla Szalma (President of Hungarian Federation of Danube Ports), Roland Kolluti (CEO of Áti Depo Zrt. (Baja) and member of the Control Committee of Hungarian Federation of Danube Ports) and Gergely Mező (Emergency and Disaster Information service (EDIS-RSOE) project-manager). After the keynotes, the participants were divided into groups for interactive sections on the following topics:

Ports as engines of the economy – The main purpose of this section was to define business opportunities for ports as engines of the economy. Thanks to a well-prepared canvas model, stakeholders, port services, customer relations, technical, human and financial resources were mapped to structure costs and benefits of establishing and operating a Danube port.

What are the most important information needed for working in the port? – In the frame of this section, all the major information was collected that are necessary for port employees. Workshop attendees mentioned general data on handled goods, responsibilities when designing and completing services.

How do you imagine a modern, future port operation? How can innovative technologies and systems help the daily work of ports? (International and domestic level) - The main purpose of this section was to discover the opportunities and challenges of developing an innovative technology-oriented port information system. During the 4 times 15 minutes workshops, 6 categories of technologies and solutions were defined which are of interest for inland ports.

Technologies related to the port infrastructure	• Automatization; robot technology • Self-guided technologies • Drones • Central control or remote-control technology • Background management e.g. by tablets; the aim is the full replacement of papers • Self-repair system • GPS and mobile application-based leadership (everything in the "cloud")
Technologies related to the vessels	• Electric and air-cushion boats • Moving in the vacuum space • Underwater loading • Floating cranes • Ship sinking measurement by laser • Covered water transfer dock
Data management solutions	• Common database • RFID product identification and integrated systems for continuous transport and no stopping (in connection with traffic management systems) • AIS and KIR (integrated port information system) standardized systems
Measures to support the workforce (will we have workplaces in the future?)	• Employment support system • Vocational training (human part, which should be port specific and technological part such as about maintenance services) • Internship programs (cooperation between schools and companies)
Background measures	• More effective security and control systems • Reliable forecasting system for water information (real-time) • Cooperation between ports e.g. by incoming vessel management (but it is price dependent)
Topic related to environmental effects of the ports	• Innovative, environmentally conscious and nature friendly developments • Self-service port in combination with power plants • Closed-circuit operation and no noise and air pollution

	• Complex production method and not just freight transport e.g. making woodchips for logs, waste recycling, container loading

How does a port entry and port information system in 2040 look like? - The main objective of this section was to map those functions and services the future Danube port will offer and define solutions for handling sensitive data and permissions when accessing these pieces of information and statistics. Key findings were to reach a critical mass of companies in the port that jointly can develop and operate the port entry and information system; IT security (GDPR) is a crucial issue to manage; in case of a well-developed modular system, stock exchange can be maintained as well along the river. Future practices in the field of port information will be:

- cloud-based services where actors can share information on their turnover, services, development and relevant news
- data provision shall be managed via one single channel and not to different statistical offices and ministries for different purposes; one interface, a modular system shall be developed decreasing ports' administrative tasks
  - it is crucial to define what sort of data shall be collected in which form
- permissions and licenses for accessing sensitive data provided by clients, freight forwarders, port operator and port management/administration companies shall be ruled in 2030/2040 as follows
  - clients can follow the route of their own products: where are they in the supply chain, whether their cargo arrived a port/final destination
  - port administration/management company can have access to its own turnover statistics, seeing any type of cargo handled in the port
  - national authority can have access to all data provided by ports
- GDPR and cyber security are crucial in case of such sensitive data on micro and macroeconomics (company level and national level)
- adapting such a complex regime needs a critical mass of companies settled in a certain port and, also
- it requires enormous investments;
  - therefore, a well-designed and intelligent, modular system is required that can ever be further developed
- stock exchange can be developed on products transported on inland waterways

5.4 Port employees of the future

During each national workshop, personas were developed for the top management, the middle management and lower management/operational level. The lower management and operational level have been summarized during the expert rounds since stakeholders argued that they are not sure whether the operational level will be obsolete due to technological advances. The results for each management level are summarized in the following table. The first line shows the main biographical background, the second line contains the main working conditions of the job and in the third line; the required competences and skills are

summarized. The last line includes the main chances and challenges for the personas for the three management levels. Expert rounds participants mentioned that the top management positions can also be occupied by women. In fact, expert rounds participants stated that they believe a woman or man can occupy a position in the top and middle management in the future and that these management levels will not be dominated by men in the future. Concerning the operational level, expert rounds participants mentioned that the operational level would remain a male domain in the future. An interesting result is that in all three transnational expert rounds participants mentioned that each of the three personas need to have IT know-how (e.g. general computer skills).

	'CEO/Port Manager' (top management)	**'Operations Manager' (middle management)**	**'Port Worker' (lower management/operational)**
biography	• male/female • 40 years or older • work experience in port business/general business: +15 years • lives close to port (short distance commuter) • work-life balance is important • married/divorced with children	• male/female • 35 years old • lives close to port (short distance commuter) • work-life balance is important • technical/commercial education with engineering background • long work experience (~5-10 years) • married/divorced with children	• male • 25-30 years old • migration background (Austria) • not married, no children • lives close to port (short distance commuter) • secondary education/school-leaving qualification
working conditions	• income: ~ 3,000 € (50% fixed and 50 % variable part) • high responsibility • working more than 8 h/day, weekends if necessary, overtime is own responsibility (~10 h overtime per week) • from CIO (Chief Information Officer) to CEO (Chief Executive Officer)	• income: ~1,800 € (70% fixed and 30% variable part) • flexible working hours (home office) • responsible for operational (e.g. logistical) activities in port • high availability necessary (24/7) in case of emergencies	• income: ~ 1,000€ • diverse responsibilities which include maintenance, facility management and other operational tasks (e.g. forklift driver) • shift work with fixed hours

competences/ skills	• financial skills and competences • multiple languages: local language, English, second foreign language • IT know-how (ECDL exam, general computer skills) • leadership skills • social and networking skills • logistical knowledge • sensitivity for innovation (knows which trend is relevant to the port and which is not) • life long learning and further training to stay up to date (e.g. attending expert rounds, online trainings,…)	• technical, commercial and engineering know-how • multiple languages: local language, English, second foreign language • IT know-how (ECDL exam, general computer skills) • stress resistant • social competence • networking/communication skills	• language skills: local language and English • IT know-how (general computer skills) • willing to learn new things (further training) • networking/communication skills • skilled craftsmanship

Table 14 - Summary of Personas developed in the three transnational expert rounds

6 Guidelines for HR-Development

Considering the results from the Deliverables described above – and especially based on the results from the survey conducted at the beginning of the Activity 4.3. the following next steps and recommendation can be derived in general for training of port employees:

- make all arrangements to be prepared for future retirement of a high number of employees in the port sector and in general
- attractiveness of jobs in the port and port areas for young people and for lateral entrants should be guaranteed (dissemination)
- make the port an attractive location for the establishment of new businesses which could increase overall economic output
- dissemination measures in schools about job opportunities in ports (especially schools with logistics focus) to increase attractiveness of workplace
- standards in education and training in ports on European level
- offer dual training – theoretical courses with practical relevance

- organize transnational workshops/trainings with port employees to stimulate transnational training and exchange best practices on an transnational level
- take measures to make working in a port/port area attractive to women and young people or students
- make port authorities/companies located at ports aware of funding sources and help them to use them
- Include ports in future projects on the topic of training in ports (e.g. get funding to elaborate learning materials, transnational training courses etc.)
- evaluate the impact of trends such as digitalization on Danube ports and its effect on training required

Inland navigation in common is a very traditional economic sector. The freight transport sector including inland ports is associated with low salaries and long working hours. According to the survey, conducted older male employees in general dominate the sector of inland ports. About 77 % of people employed by port authorities included in the survey conducted in this Activity were male. Particularly in operative positions, the share of female employees is very low (this may be due to the heavy physical labour). Although the sector is rather traditional, there are trends such as sustainability, digitalization and innovation, which are changing the market of transport and therefore are affecting inland navigation and inland ports. To keep ahead with the changing environment and break-up the conservative port procedures there are four guidelines defined in order to create diversity in ports as preparation for the future of ports to become important economic centers in supply chains. These four guidelines are on the topics of 'general awareness and attractiveness', 'attractiveness particular for young people and women' and 'life-long learning' and are also summarized in Figure 1 at the end of the document.

- **Create general awareness on ports as workplace**

In order to create general awareness on ports as workplace ports could cooperate with education and training facilities like universities in forms of offered internships for post-graduates. Also real life cases and port related topics can be integrated in education and training, e.g. in form of case studies. This could be adapted to different types of schools and/or different ages and types of graduates.
Additionally to the presence in education and training, ports can force their visibility at job centres (e.g. AMS in Austria) and their re-education/re-training programs or programs for career-break-returners.

- **Promote inland ports as attractive work place for young people**

Measures could be the dissemination of career opportunities for young people in inland ports or field trips for schools. By promoting inland ports as attractive work places among young people such as logistics students by promoting inland ports as work places during lectures (e.g. guest lecture from port authority in school), new qualified employees may be recruited for inland ports. Port authorities, as internal stakeholders, as well as external stakeholders

such as educational institutions should be involved to implement this recommendation successfully.

- **Promote inland ports as attractive work place for women**

The majority of port employees are male; especially top management and operational level are male dominated. This may be because generally men occupy the majority of jobs with a risk of accidents and injuries. Further, the majority of port employees are working on operational level (e.g. forklift driver, berth operator) and thus are confronted with a higher risk of accident and injuries than employees in office jobs. This may be an explanation for the male dominance in the inland port sector. As standardized rules for health and safety regarding professional training of port employees on a European level, dissemination and promotion of health and safety issues may increase interest of women to work in ports at operational level. Top-level management also is male dominated in ports. Therefore the dissemination of career opportunities for women in inland ports or field trips for women (women's' day) could be adequate measures. Again, internal and external stakeholders should be involved to increase the probability of success.

- **Life-long learning for port employees**

In order to provide up-to-date training to current employees in the transport sector life-long learning measures are crucial. To keep ahead with trends in the transport sector ports have to improve education and training and ensure equal learning and labour opportunities for their employees. This could be realized on a transnational basis along the Danube corridor.

One major point mentioned by several port authorities and logistics companies situated at port areas is not just to raise awareness and promote the sector, but also be more attractive by balancing the relation between work and wages and also offer social benefits such as a restaurant, cafeteria or recreation areas like parks.

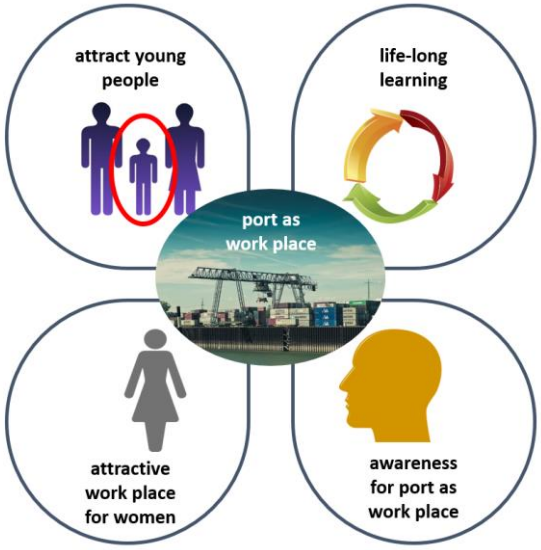

Figure 1 - Capacity Building Guidelines