



الأكاديمية العربية للعلوم والتكنولوجيا والنقل البحري
Arab Academy for Science, Technology & Maritime Transport



The International Maritime Transport and Logistics Conference "Marlog 9"
Impacts of the Fourth Industrial Revolution on Port-City Integration
"World Port Sustainability Program Aspects"



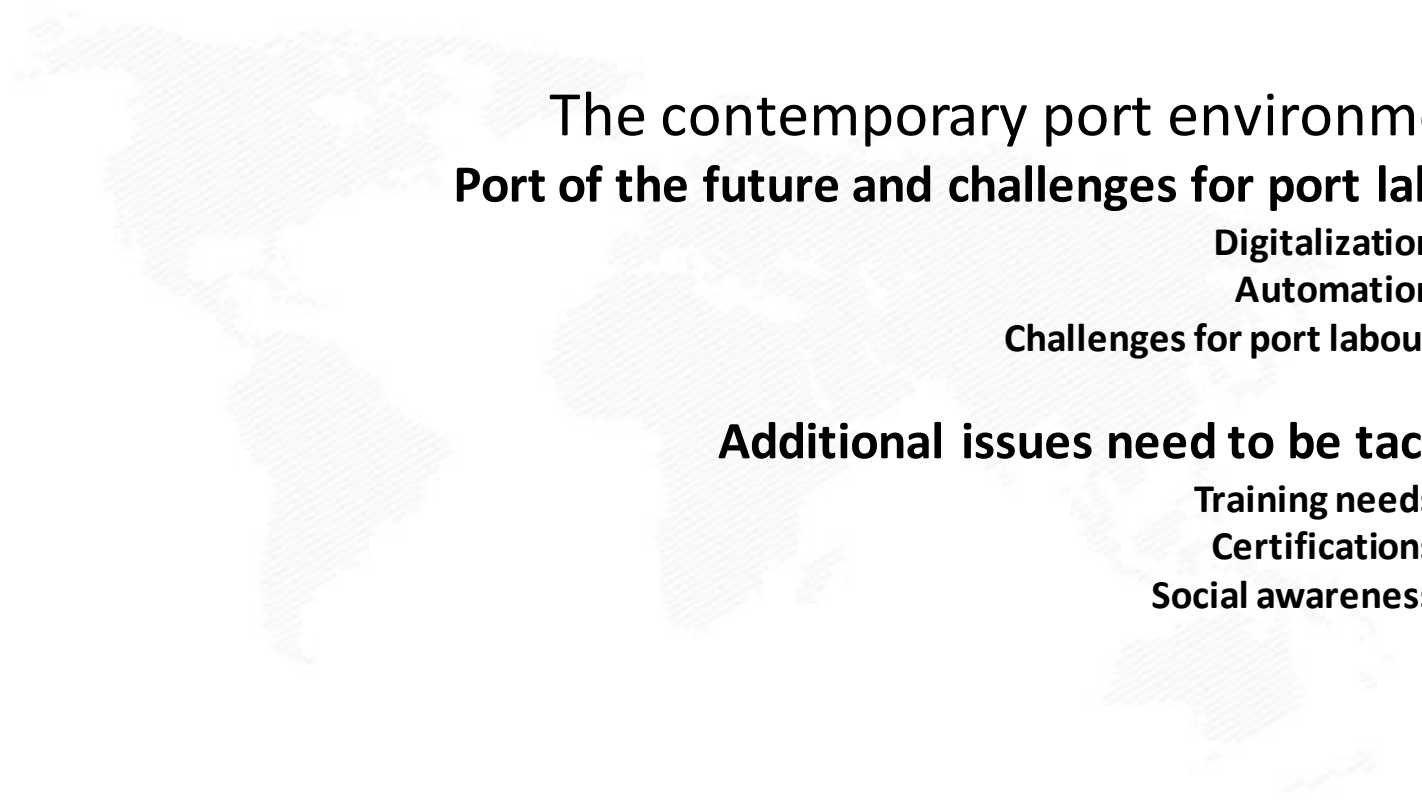
The changing port labour environment in the era of
port automation and digitalization

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10-12- October, 2020



Structure

- 
- The contemporary port environment .1
 - Port of the future and challenges for port labour .2**
 - Digitalization •
 - Automation •
 - Challenges for port labour •
 - Additional issues need to be tackled .3**
 - Training needs •
 - Certifications •
 - Social awareness •



The contemporary port environment

- Increasing competition .1
- Liner shipping strategies .2
- Technological developments .3
- Commercialization .4
- New organizational models .5
- Expanding containerization .6

Results

- In pursuit of Port Performance .1
- Port operations are becoming more capital intensive than labour intensive .2



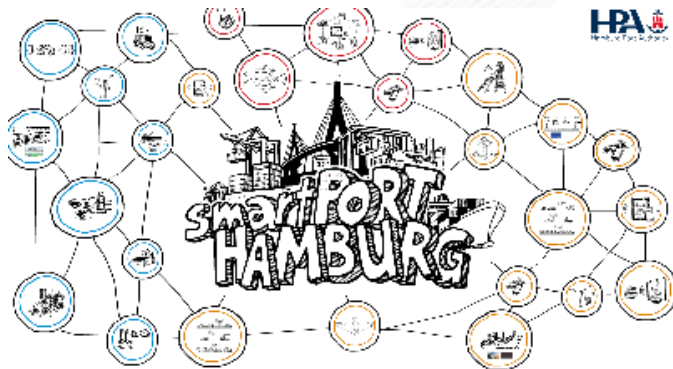
Port of the future – Drivers of change

Digitalization •

- Formation of digital supply chains (optimization of port logistics chain)
- Big Data (reducing energy consumption)
- Internet of Things (i.e. helping in developing an efficient way for managing port traffic, cloud-analytics)
- Blockchain (i.e. secure system for collecting containers in the port)

Allows for

- Increased efficiency
- Better planning ahead
- Increased responsiveness



Port of the future – Drivers of change

Automation •

- Automation of port processes ➤
- About 1% of major ports are fully automated and 2% are semi-automated ➤
- By 2021 about 100 ports are expected to be fully automated ➤
- Introducing robots in port operations (sea-to-shore, dock-to-yard) ➤

SingularityHub

TOPICS IN FOCUS

Topics

Chinese Port Goes Full Robot With Autonomous Trucks and Cranes

By Marc Prosser - May 17, 2018 👁 7,993



Port of the future – Challenges for port labour



Port automation: A benefit or a curse for port labour?

- Jobs security - Loss of jobs
- Changes in jobs description
- Jobs are becoming more mentally demanding
- Flexible working conditions

- + Increasing demand for new jobs and roles (automation engineers, programmers etc)
- +increasing labour productivity
- + **Strategic jobs**: Direct impacts on work flow (e.g., data processing)

But at the end...



Costs found to outweigh port automation benefits

Greg Knowler, Senior Europe Editor | Dec 13, 2018 1:11PM EST

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Port of the future – Challenges for port labour



- There is a need for:
- Highly skilled personnel –
 - New capabilities for port labour –
 - Exploiting the human-machine interface –
 - Reviewing the role and the skills of port labour –

Transition from...



Strength



Skill



...more challenges

Training needs •

Redefinition of the critical skills required –

Continuous advances of technology –

Self-development –

Multi-task workers and multiskilled operations are becoming more –
common in ports

New career opportunities for the future –



...and more

Certified port labour jobs

- Absence of a common approach at EU level as regards:
- Job description –
 - Skills requirements –
 - Training characteristics –
- Port jobs need to be certified aiming at:
- ensuring a minimum level of quality
 - creating a level playing field
 - allowing mobility of port labour in the EU port industry
- Once again job and skills descriptions are required

Social awareness

with an eye on:

The societal status of the profession •

The profession pride •

Change in the overall gender composition •

The goal is to attract and maintain workforce in port operations



The changing world of port work



From	Towards
Single skilled labour	Multiskilled/specialist workers
Labour intensive operations	Capital-Technology intensive operations
Port/terminal based certification schemes	Harmonized certification schemes
Casual hiring	Permanent employment
Informal on-the-job training	Formalized training
Male workforce	Gender equality



What will be the future working environment?

The workplace •

An IT centre instead of the dock? –

Patterns of employment •

Formal or informal change & introduction of flexible forms of employment –

Location of work ? •

The physical reorientation of port related activity –

**Attract the best-Realize the type of jobs available to –
existing and new workers**

Operating mechanical and transport equipment jobs: can not be entirely eliminated –

but the worker needs to operate & understand technologies.

Pros and Cons of technological development for port labour

Advantage	Disadvantage
+ increasing demand for new highly-skilled workforce	- jobs security – loss of low skilled jobs
+ increasing health and safety conditions	- changes in jobs description
+ increasing labour productivity	- jobs are becoming more mentally demanding
+ strategic jobs: direct impacts on work flow, interdependent, non-substitutability	- flexible working conditions

Conclusions

- The paper contributes on the ongoing debate on the challenges and the opportunities that technological development creates for port labour.
- Provides a first conceptual framework for addressing the impact on digitalisation and automation on port labour.
- It is not yet possible to provide a complete overview of all the variables expected to be affected by automation and digitalization.
- New requested skills related to each port task, innovative training courses to be set and developed, have to be further investigated



Thank you!

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