TRANSPORT 2040: AUTOMATION, TECHNOLOGY, EMPLOYMENT
THE FUTURE OF WORK

Dr. Cleopatra Doumbia-Henry
President of the World Maritime University

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Our Mission

To be the world centre of excellence in postgraduate maritime and oceans education, professional training and research, while building global capacity and promoting sustainable development.

A postgraduate level university established by and within the framework of the IMO
Centre of Excellence recognized by the UN General Assembly

Academic Excellence
The UN General Assembly on 11 December 2018 adopted the Resolution_73-124_on_Oceans_and_the_Law_of_the_Sea. The Resolution continues to recognize the importance of WMU, which celebrated its thirty-fifth anniversary in 2018, as a centre of excellence for maritime education and research, confirms its effective capacity-building role in the field of maritime transportation, policy, administration, management, safety, security and environmental protection, as well as its role in the international exchange and transfer of knowledge, welcomes the inauguration in 2018 of the World Maritime University-Sasakawa Global Ocean Institute, and urges States, intergovernmental organizations and other bodies to make voluntary financial contributions to the University’s Endowment Fund.

How we contribute globally

- Master Programmes
- PhD Programme
- Postgraduate Diplomas offered via distance learning
- English and Study Skills Programme
- Customized Professional Education
- Solution focused and policy relevant Maritime and Ocean Research
- Technical Cooperation Support at request by IMO
Our Master Programmes

Malmö based MSc in Maritime Affairs
- Port Management
- Maritime Education and Training
- Shipping Management and Logistics
- Maritime Energy Management
- Maritime Law and Policy
- Maritime Safety and Environmental Administration
- Ocean Sustainability, Governance and Management

Dalian based MSc programme
- Maritime Safety and Environmental Management

Shanghai based MSc programme
- International Transport and Logistics

Mphil WMU/IMLI International Maritime Law and Ocean Policy

International Maritime Law (LLM)
Our Results

4,919 Graduates
90% Developing Countries
1,029 Female Graduates
168 Nationals

35 Years of Excellence in Developing Global Capacity and A Global Network of Maritime and Ocean Leaders
Our Global Impact

A dedicated global educator to promote gender equality and empowerment of women
- First female Director General, National Fisheries & Aquaculture Authority Liberia
- First Argentinian woman who command a patrol boat

Leaders in Maritime and Ocean Sectors (selected)
- IMO Secretary-General, 2 ASGs, Director of TCD, Head of Division, Experts etc.
- IMO Council Chair and Delegates
- Ministers, Vice Ministers and Directors-General in Member States Administrations (Ministries, Port Authorities, Maritime Administrations, Marine Department, Cost Guard) Antigua and Barbuda, Argentine, Bahrain, Bangladesh, Cambodia, Cape Verde, Chile, China, Ghana, Grenada, Guyana, Indonesia, Iran, Iraq, Jordan, Liberia, Lithuania, Malawi, Mauritius, Nigeria, Oman, Philippines, Republic of Korea, Senegal, Sierra Leone, Tanzania, Trinidad & Tobago, Turkey, Vietnam
- Director General, International Mobile Satellite Organization
- Secretary General, International Commission of the Congo Obangui-Sangha Basin
- Professors and Researchers
Report Launch

15 Jan 2019
International Maritime Organization
High Impact

Downloads: 4,000+

Highly covered by the reputable media sources

Extensive sharing in social media
Related UN SDGs to this research

4 Quality Education
5 Gender Equality
8 Decent Work and Economic Growth
9 Industry, Innovation and Infrastructure
13 Climate Action
14 Life Below Water
Technology Trends: Maritime
Fully automated port terminals are already a reality, but are newly built. “Traditional” ports will become more digital, improving the safety and efficiency of use of the available port infrastructure.
Current automated terminals

- Not Automated: 97%
- Semi Automated: 2%
- Fully Automated: 1%

~1,300 container facilities worldwide

Source: Drewry Maritime Research
Automated terminals: examples

NETHERLANDS:
Rotterdam
Maasvlakte II
(opened: 2015)

Source: APM Terminals
Automated terminals: examples

CHINA:
Qingdao
Qianwan
(opened: 2017)
Automated terminals: examples

**AMERICA**

**UNITED STATES:**
Long Beach - LA
(opened: 2017)

Source: ABB Marine
Automated terminals: examples

AFRICA

MOROCCO:
Tanger-Med
(expected: 2019)

Source: Seatrade Maritime News
THE SIX MAIN FACTORS THAT DETERMINE TECHNOLOGY ADOPTION

1. **Technology Feasibility**: Is the technology ready for its large-scale application?
2. **Economic Benefits**: Has a sound business model been drawn up?
3. **Labour Market Dynamics**: Is labour expensive? Is there a labour shortage?
4. **Regulation and Governance**: Are regulations ready? Are the authorities supportive?
5. **Knowledge and Skills**: Are users able to master the technology?
6. **Social Acceptance**: Does society accept the technology?
Seaborne trade will continue to grow

Seaborne trade will continue to increase, putting pressure on ports to handle more cargo in the future.
Overview of the Labour Force

168 Million Transport Workers

3.3 Million Sea Transport

12% High-Skill
- Ship Engineer
- Ship Officer
- Aircraft Pilot
- Air Traffic Controller
- ...

72% Medium-Skill
- Crane Operator
- Forklift Operator
- Heavy Truck Driver
- Ship Rating
- ...

16% Low-Skill
- Dock Worker
- Warehouse Porter
- Freight Handler
- Baggage Handler
- ...

2,000+ detailed work activities (all occupations)

70+ countries analysed
Overview of the Labour Force

Most port-related workers are in this group

TRANSPORT MODES
- ROAD 92%
- RAIL 8%
- SEA 2%
- AIR 2%
- SUPPORT 14%

GENDER SPLIT ALL MODES
- MALE 80%
- FEMALE 20%

Sources: Bureau of Labour Statistics (BLS), Eurostat, ILO, WMU Analysis
Overview of the Labour Force

High-risk task automation

Potential for Automation (Probability)

Current Automation (%)
Country Profiles as a tool for assessing technology

Key factors influencing the introduction of new and emerging technologies in a country

Innovation and Technology

Human Capital and Skills

Regulation and Governance

Infrastructure Quality

Business and Investment

Five factors influencing readiness to introduce new technologies and automation in a country
Country Profiles as a tool for assessing technology

Source: WMU Country Profiles – Technology Readiness: Maritime
Main Conclusions and Findings

Main conclusion:
Qualified human resources with right skills will still be needed in transport

Findings:
1. Gradual pace of introduction of automation and technology influenced by economics benefits, demographic trends and safety factors
2. Higher demands for transport resulting from continuous growth in trade
3. Effects of automation and technology are predictable and impact low and medium skill jobs most
4. Automation and technology is influenced by the local context
Automation is here to stay. Nations need to anticipate for shifts to come as the nature of work will change. Education and re-training systems are essential for the adaptation of workers to the new skills needed. ITF-WMU study provides the facts for developing a voice that can effectively ameliorate the effects of technology in the world of labour.
THANK YOU FOR YOUR ATTENTION

FREE TO DOWNLOAD AT:
HTTPS://COMMONS.WMU.SE/LIB_REPORTS/58/