

International Expert-Conference on Human Rights of older Persons

12-13 November 2018, Vienna

World Economic and Social Survey 2018

Frontier Technologies for Sustainable Development



Robotics, Automation and Human Rights Implications for Older Persons

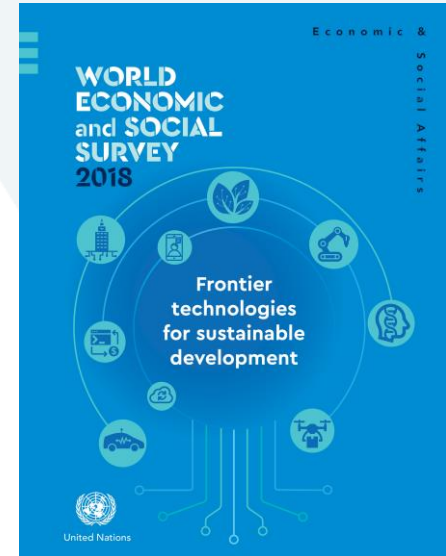


UNITED NATIONS
DEPARTMENT OF ECONOMIC
AND SOCIAL AFFAIRS

Panel 1 Presentation
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World Economic and Social Survey 2018

- **Flagship publication** on major development issues prepared by the Department of Economic and Social Affairs of the United Nations Secretariat
- **Focus:** on emerging technologies and examines how policy measures can expand their potential benefits and mitigate their potential adverse effects
- **Frontier technologies:** those that are innovative, fast-growing and have potential to exert significant impact on societies, economies and the environment
- **Examples:** automation, robotics, electric vehicles, renewable energy technologies, biotechnologies and artificial intelligence
- www.bit.ly/UNDESASurvey



Video

<https://youtu.be/NzFTbhmiMyk>

Robotics (healthcare): Opportunities for Older Persons

Autonomous surgical robots: perform certain routine but highly technical surgical procedures. Better outcome for older persons by reducing risks of human error, minimizing trauma (incision), lowering blood loss, reducing risk of infection, decreasing complications, and shortening length of hospital stay

Assistive robots, including exoskeletons: assist older persons with physical disability to reduce physical limitation. In rehabilitation, robots used for patients with spinal injuries, ankle injuries or patients who have survived a stroke

3D printing: used to manufacture prostheses and implants and to prototype robotic exoskeletons

Robot carers: enable health monitoring, provide physical assistance, execute basic daily tasks (e.g. cooking), stimulate cognition of dementia patients, provide companionship (combat loneliness) and assure security as alert to risk of falling and heart failure at home (supports ageing-in-place) as well as in institutional care settings

Robotics (healthcare): Challenges and Human Rights Implications

Autonomous surgical robots - WHO/SAFROS Project

- Funded by the European Commission, aimed to analyze safety in robotic surgery; formalize safety requirements; establish safety procedures and verification protocols
- Consider cost of surgery robots and maintenance will have a consequence on the allocation of resources in public health systems

Robot Carers - UNESCO/COMSET 2017 Report

Appropriateness of using technology in relation to care

- Can robots provide care? Are physical and emotional aspects taken care of by machines?
- Potentially reduce interaction with other people
- Loss of autonomy? Sensitive design/programme approach to take permission before touching/moving older persons
- Loss of privacy?
- Accountability? Who is responsible if robot accidentally drops an older person?
- Develop guidelines/legislation in consultation with older persons







Robotics (transportation): Opportunities and Challenges for Older Persons

Autonomous Vehicles: most visible applications of advanced algorithms, sensors and powerful computing power (become independent learners). Utilize cameras, radar, GPS and laser

Estimated that use of AV could reduce accident rates by 90% in USA, potentially saving 30,000 lives and \$190 billion in associated healthcare costs. Better efficiency (shorter travel time), better quality of life (independence) for dependent older persons

Cannot programme moral considerations.
Unpredictable consequences (liability?)

Six stages of automation

0	1	2	3	4	5
 No automation	 Driver assistance	 Partial automation	 Conditional automation	 High automation	 Full automation
Zero autonomy; the driver performs all driving tasks.	Vehicle is controlled by the driver, but some driving-assist features may be included in the vehicle design.	Vehicle has combined automated functions, like acceleration and steering, but the driver must remain engaged with the driving task and monitor the environment at all times.	Driver is a necessity, but is not required to monitor the environment. The driver must be ready to take control of the vehicle at all times with notice.	The vehicle is capable of performing all driving functions under certain conditions. The driver may have the option to control the vehicle.	The vehicle is capable of performing all driving functions under all conditions. The driver may have the option to control the vehicle.

Automation: A Double-edged Sword

Machines perform routine and repetitive tasks - efficiency, cost-reduction, reliability, improved safety, more productivity and also frees workers from harsh physical work conditions

As automation advances increased productivity, it also transforms labour markets - changing the types of demand for skills.

With automation replacing physical labour and artificial intelligence taking over many analytical functions, achieving one of the targets under SDG 8 (Promote full and productive employment and decent work for all) will become increasingly difficult.

Automation contributes to an increase in share of capital income, yet it decreases share of income flowing to labour, leading to rise in income and wealth inequality.

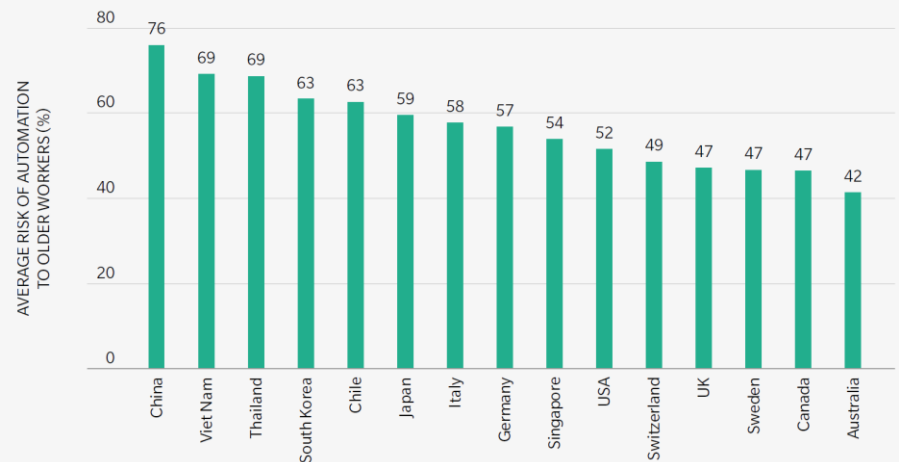
Unless policies are in place to redistribute some of the gains from automation, the process of skills polarization will further exacerbate income inequality and make it more difficult to achieve SDG10 (Reduce inequality)

Automation: Future of Work for Older Persons

A debate persists on the extent to which jobs could be automated and replaced by machines. Many technological, economic and social factors determine the extent and pace of automation (education levels, size of manufacturing sector, level of government spending, and strength of financial laws).

Mercer 2017 Study: examined the risk automation poses to older workers around the world and measured extent to which older workers are employed in low-skill work.

- **China**, average risk of automation to older workers is 76%. **Germany**, average risk of automation to older workers is 57% (despite high concentrations of advanced-skill work, older workers surprisingly susceptible to automation)
- Automation can affect countries that employ a significant number of economically active people in agricultural sector. Share of jobs at risk of being lost to is above 50% for Angola, Bangladesh, Cambodia, Ethiopia, India, Nigeria, the Philippines and Viet Nam



Automation: Policy and Human Rights Implications for Older Persons

Policymakers need to minimize the adverse impact of automation:

(Human Rights: legal guarantees, availability, accessibility, adequacy, non-discrimination)

- Build forward looking and inclusive education systems. The education system should be more inclusive, particularly for disadvantaged groups
- Governments could implement policies that encourage private sector to invest in continuous learning and development of skills in areas where demand remains unmet
- Expand social security and social protection schemes which guarantee older persons access to adequate and affordable health and care and support services

Federal Ministry
Labour, Social Affairs, Health
and Consumer Protection

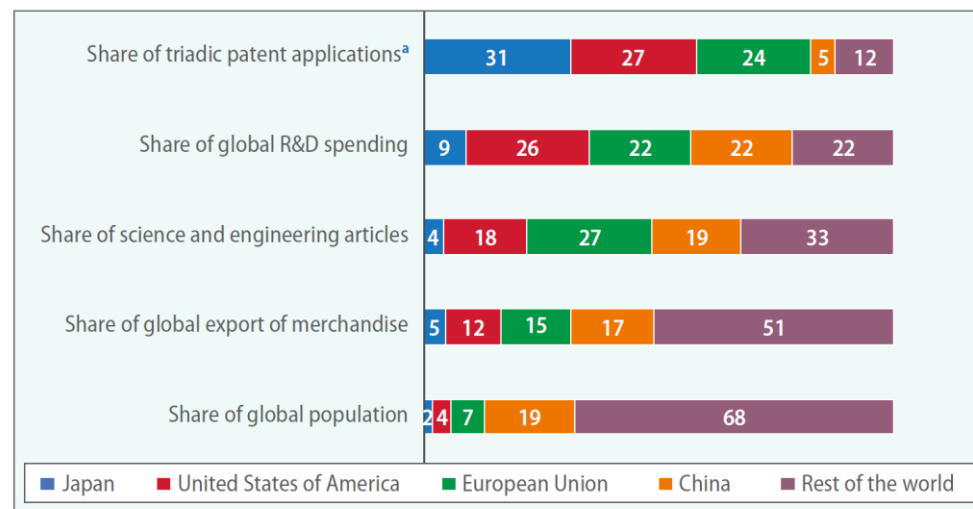
Key Takeaways: Frontier Technologies – a Bridge Too Far?

Manifestations of a great technological and developmental divide persist between developed and low-income developing countries

Closing development gaps is not only an imperative under Agenda 2030, but also a prerequisite for many developing countries to exploit the promises of many frontier technologies and bridge the technological divide that limits their growth potentials.

Lack of access to electricity, inadequate health and sanitation facilities, under-developed physical and digital infrastructures prevent the possibility of leapfrogging and taking full advantage of frontier technologies.

Share of global for various activities, selected countries and the European Union, 2015



Key Takeaways: **Frontier Technologies for a Sustainable Future**

Frontier technologies hold immense potential to improve people's lives, to foster growth, prosperity and environmental sustainability and to significantly accelerate efforts to achieve the 2030 Agenda and its Sustainable Development Goals

Frontier technologies are interdependent as advances in one are likely to impact others, and interconnected through their generation of, and need for, large data sets

Advances in frontier technologies also present new and unique challenges. Without appropriate policies they can: present risks of growing unemployment, drive greater inequality, and raise new ethical and human rights challenges

It is important that the debate focused on ethical norms and regulatory architecture be shaped not only by leading technology companies but by public debate and Governments as well. Policymakers have a significant and proactive role to play in developing the legal and ethical frameworks needed to govern the evolution and use of digital technologies