UNITED NATIONS

Current Studies

Science Technology Innovation

Industry 4.0 for Inclusive Development



© 2022, United Nations All rights reserved worldwide

Requests to reproduce excerpts or to photocopy should be addressed to the Copyright Clearance Center at copyright.com.

All other queries on rights and licences, including subsidiary rights, should be addressed to:

United Nations Publications 405 East 42nd Street, New York, New York 10017 United States of America Email: publications@un.org

Website: https://shop.un.org/

The designations employed and the presentation of material on any map in this work do not imply the expression of any opinion whatsoever on the part of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The findings, interpretations and conclusions expressed herein are those of the author(s) and do not necessarily reflect the views of the United Nations or its officials or Member States.

Mention of any firm, product, service or licensed process does not imply endorsement or criticism by the United Nations.

This publication has not been formally edited.

United Nations publication issued by the United Nations Conference on Trade and Development.

UNCTAD/DTL/STICT/2022/4

ISBN: 978-92-1-113036-2

eISBN: 978-92-1-001444-1

Sales No. E.22.II.D.8

Acknowledgements

This UNCTAD study was prepared by Clovis Freire (team leader), Daisuke Maruichi, Eugenia Nunez and Ruslan Rakhmatullin, under the supervision of Liping Zhang, Chief, Science, Technology and Innovation Policy Section, with the guidance of Ángel González-Sanz, Head, Science, Technology and Information and Communications Technology Branch, and under the overall direction of Shamika N Sirimanne, Director, Division on Technology and Logistics, UNCTAD.

Contributions from the Governments of Belarus, Belgium, Brazil, the Dominican Republic, Egypt, the Islamic Republic of Iran, Japan, Kenya, Latvia, Peru, the Philippines, Portugal, the Russian Federation, South Africa, Switzerland, Thailand, Turkey and the United Kingdom of Great Britain and Northern Ireland, as well as the Economic and Social Commission for Western Asia, the International Telecommunication Union, the United Nations Industrial Development Organization and the World Tourism Organization, are gratefully acknowledged.

The study benefited significantly from discussions held and inputs provided during the 2021–2022 intersessional panel meeting of the Commission on Science and Technology for Development, held from 17 to 19 November 2021.

Magali Studer designed the cover. Malou Pasinos provided administrative support.

Note

UNCTAD serves as the lead entity within the United Nations Secretariat for matters related to science and technology as part of its work on the integrated treatment of trade and development, investment and finance. The current UNCTAD work programme is based on the mandates set at quadrennial conferences, as well as on the decisions of the General Assembly of the United Nations and the United Nations Economic and Social Council that draw upon the recommendations of the United Nations Commission on Science and Technology for Development, which is served by the UNCTAD secretariat. The UNCTAD work programme is built on its three pillars of research and analysis, consensus-building and technical cooperation, and is carried out through intergovernmental deliberations, research and analysis, technical assistance activities, seminars, workshops and conferences.

This series of publications seeks to contribute to exploring current issues in science, technology and innovation, with particular emphasis on their impact on developing countries.

The terms "country" and "economy", as appropriate, also refer to territories or areas. The designations of country groups are intended solely for statistical or analytical convenience and do not necessarily express a judgment about the stage of development reached by a particular country or area.

The term "dollars" (\$) refers to United States dollars unless otherwise specified.

Contents

I.	Intr	Introduction1		
II.	Trends in industrialization, inequalities and the effects of the pandemic 3			
III.	Industry 4.0: Concept and main characteristics			
	Α	A new technological paradigm?	. 9	
	В	Development and use of industry 4.0 in manufacturing	11	
	С	Benefits of industry 4.0 in manufacturing	12	
IV.	Ind	ustry 4.0 and inequalities	14	
	Α	Effects on inequalities in profits, wages and jobs	14	
	В	Effects on inequalities through technological revolutions	18	
V.	Par	ticular challenges	21	
	Α	Displacements of workers and wage inequality		
	В	Reshoring of production and restructuring of foreign direct investment and globa		
		value chains	22	
	C	Protecting workers in the industry 4.0 era	23	
	D	Gender-related implications	24	
VI.	Harnessing industry 4.0 for inclusive and sustainable development 25			
	Α	Creating preconditions for harnessing industry 4.0	25	
		Diversifying the economy and building a manufacturing sector	26	
		Developing a digital infrastructure	27	
		Building skills for industry 4.0	28	
		Developing national strategies for industry 4.0	29	
		Fostering multi-stakeholder collaboration	31	
		Building international partnerships		
	В	Fostering the adoption of industry 4.0	32	
		Raising awareness among businesses	32	
		Investment		
		Financing deployment		
	C	Protecting workers and easing workforce transitions	35	
VII.	. Int	ernational collaboration	36	
	Α	Sharing knowledge and information and conducting research	36	
	В	Helping design policies and strategies and implement initiatives	37	
	C	Helping capacity-building	38	
	D	Promoting technology transfer	38	
	Ε	Helping to set legal frameworks, guidelines, norms and standards	38	
VII	I. Co	onclusions and recommendations	40	

Annex A Experiences with industry 4.0 among member States of the Commission on Science and Technology for Development......43 Latvia 54 Peru 56 Portugal 61 Switzerland 67 Annex B Questions for discussion78 **Boxes**

Figures

Figure 1	Share of gross domestic product by broad economic sector and income grouping (Percentage)
Figure 2	Employment level, by broad economic sector and income grouping (Percentage)
Figure 3	Employment in medium-skill jobs by type of activity (Percentage of total civil employment)
Figure 4	Share of publications and patents by technology (Percentage)
Figure 5	Inequalities from the perspective of production
Figure 6	Contribution of different sources of inequality to global income inequality (Percentage)
Figure 7	Determining which economies may initially be better positioned to benefit from industry 4.0: Indicators of readiness (Percentage)
Figure 8	Technological revolutions and inequalities
Figure 9	Employment by skill level as share of total civil employment (Percentage)
Figure 10	Deepening the global value chain smile curve
Figure 11	Association between UNCTAD frontier technology readiness index and diversification of economies, 2019
Tables	
Table 1	Selected industry 4.0 technologies in manufacturing 8
Table 2	Technological-economic paradigms
Table 3	Major provider firms by technology11

预览已结束,完整报告链接和二维码如下:

https://www.yunbaogao.cn/report/index/report?reportId=5_31044

