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ON SCIENCE AND TECHNOLOGY FOR DEVELOPMENT (CSTD)**

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Contribution by Brazil

to the CSTD 2021-2022 priority theme on “Industry 4.0 for inclusive development”

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## **PRIORITY THEME 1: INDUSTRY 4.0 FOR INCLUSIVE DEVELOPMENT**

1. What are the national strategies, policies, laws, programmes and initiatives concerning Industry 4.0 in your country?

The Brazilian Chamber of Industry 4.0 brings together government, academia and the business sector to drive digital transformation in the country, in a coordinated way. The Action Plan 2019-2022 of the Brazilian Chamber of Industry 4.0 established initiatives by its 4 working groups: (i) Technological Development and Innovation; (ii) Human Capital; (iii) Productive Chains and Development of Suppliers; and (iv) Regulation, Technical Standardization and Infrastructure.

The implementation of the Action Plan 2019-2022 achieved already important results for the productive sector in Brazil, such as:

- Modernization of the labor regulation, related to safety at work in production equipment, facilitating the interaction human-machine for the Industry 4.0;
- Monitoring of the General Law of Personal Data Protection, with legal provisions on data protection and granting of telecommunication services, and elaboration of a handbook to advise enterprises on how to apply the law;
- Establishment of the Center for the 4th Industrial Revolution, affiliated to the World Economy Forum;
- Constitution of "Basket4.0" ("Cesta4.0"), which indicates industrial and technological segments of Industry 4.0 that can serve as reference for investments and promotion of this industry of Brazil;
- Creation of the digital platform Mapping 4.0 (Mapeamento 4.0), in which public and private institutions register their initiatives of Industry 4.0; Identification of soft skills capacities to instructors, teachers, professors and students that work with technologies and process of Industry 4.0;
- Offer of courses of Industry 4.0 on digital platforms with Distance Learning methods;
- Support to the initiative "Future Factories" ("Fábricas do Futuro"), which fosters test beds for Brazilian companies and institutions create real environments to test innovative solutions of Industry 4.0;
- Creation of the Program NAGI Digital, which constitutes a support network to the innovation management, in order to improve methodologies with focus on digital transformation;
- Creation of the Program Brazil Plus Economy 4.0, which support the development and accelerate the implementation in small and medium-sized companies of 4.0 technologies such as Internet of Things (IoT), blockchain, artificial intelligence, machine learning (machine learning) and 5G internet applications;
- Funding to companies that are entering in the Industry 4.0 ecosystem, through tools such as FINEP Inovacred 4.0, BNDES Finame Máquinas 4.0, Rota 2030, FINEP IoT, and public calls like MCTI/FINEP Tecnologias 4.0;
- Release of the Standardization 4.0 Roadmap Proposal; Release of studies related to the

identification of segments or niches with greater potential for national technological development.

2. What are the key industries that are pioneer Industry 4.0 innovation in the country? List the key actors in the national ecosystem of innovation related to Industry 4.0 in your country (firms, universities, financial institutions, regulators)? What are the key networks of the ecosystem in your country (including online networks, innovation hubs, forums, etc.)?

The key industries in Brazil with high potential to increase competitiveness with 4.0 technology are: automotive, oil and gas, pharmaceutical, textile, chemical, food and beverage, agroindustry and aerospace and defense, according to a recent study released in 2020.

Brazilian ecosystem of innovation is very robust, evolving many S&T institutions, science parks, universities, firms and innovation agencies. The Brazilian Chamber of Industry 4.0 seeks to involve most of the actors.

3. What are the challenges that your government have faced or may face for promoting Industry 4.0 in your country to contribute to national development priorities and accelerate the progress towards the SDGs?

The deeply understanding of the challenges and impacts raised from the emergence of Industry 4.0 in distinct productive sectors has been critical for the design of new industrial and technological policy strategies. It introduced complex environments, characterized by different demographic, economic, regulatory and social changes. Industry 4.0 also created new threatens and opportunities to public and private institutions, in the government, business and research fields.

The Industry 4.0 ecosystem demands national policy efforts related to converging and enabling technologies, capacity building, new business models of the productive chains, and adjustment in the support infrastructure, which includes technical standardization and regulation.

The insertion of productive sectors in this ecosystem depends on internal and external factors to the companies. The major challenges are presented to micro, small and medium enterprises (MSME), which, in Brazil, accounts for more than 90% of the enterprises, and, most of them, are still surrounded by 2nd Industrial Revolution technologies.

4. What should governments, the private sector, labour unions and other stakeholders do so that developing countries can benefit from these technologies?

They should invest in initiatives to qualify and retrain the workforce and promote the Industry 4.0 technologies in production chains. In the Brazilian Chamber of Industry 4.0, there are two working groups focused on these challenges.

5. What actions can the international community, including the CSTD, take to help your country take advantage of Industry 4.0 for inclusive and sustainable development?

International political dialogue and technical cooperation initiatives are essential for the dissemination of good practices and knowledge sharing for the increase of competitiveness of national industry and insertion in global value chains.

6. Could you suggest some contact persons of the nodal agency responsible for projects/policies and international collaboration in this context as well as any experts (from academia, private sector, civil society or government) dealing with projects in this area? We might contact them directly for further inputs or invite some of them as speakers for the CSTD inter-sessional panel and annual session.

Mr. José Gontijo, Director of Science, Technology and Digital Innovation at the Secretariat of Entrepreneurship and Innovation of the Ministry of Science, Technology and Innovation:

[decti@mctic.gov.br](mailto:decti@mctic.gov.br)

+55 (61) 2033-7992

Mr. Newton Hamatsu, Innovation Superintendent at Finep Innovation Agency:

[hamatsu@finep.gov.br](mailto:hamatsu@finep.gov.br) +55 (21)

2555-3997

Mr. Roberto Soboll, Coordinator of MCTI/Embrapii

Network of Digital Transformation and Managing

Director at ELDORADO Institute:

[roberto.soboll@eldorado.org.br](mailto:roberto.soboll@eldorado.org.br) +55 (19) 3757-3000

7. Do you have any documentation, references, technological assessments, future studies or reports on the priority theme in your country or region?

Documentation in Portuguese is available at:

[https://www.gov.br/mcti/pt-br/acompanhe-o-mcti/transfo  
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