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Revista JRG de Estudos Acadêmicos

Página da revista:
https://revistajrg.com/index.php/jrg

ISSN: 2595-1661

Industry 5.0 narrative: utopia and reality

O discurso sobre indústria 5.0: utopia e realidade

DOI: 10.5281/zenodo.8055689
ARK: 57118/JRG.v6i13.624

Recebido: 23/03/2023 | Aceito: 19/06/2023 | Publicado: 01/07/2023

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Abstract

The paper analyses INDUSTRY 5.0 definition and its narrative on a broad and didactical discussion to explain and clarify is better thanking care of the narrative, political fashions, and gurus. We need to start with figures. A start should be a deep understanding of the information economy and a critique of the INDUSTRY 4.0 definition. The sustainable development and human wellbeing narrative is an umbrella for discussion used especially today as political goals. But when we seek global indexes, it is easy to see how is manipulated the general narrative. The result and the suggestion of the paper are to change the horizon and the goals of the new INDUSTRY 5.0 narrative into a new Social and environmental development model starting from the economics drivers and avoiding the false narrative of a technology or fake environmental ideology-driven pink future

Keywords: Industry 5.0. Industry 4.0. Utopia. New social development.

Resumo

O artigo analisa a definição da INDUSTRY 5.0 e sua narrativa em uma discussão ampla e didática para explicar e esclarecer o perigo e cuidado da narrativa, modismos políticos e gurus. Precisamos começar com números. Um começo deve ser uma compreensão profunda da economia da informação e uma crítica da definição da INDUSTRY 4.0. A narrativa do desenvolvimento sustentável e do bem-estar humano é um guarda-chuva para discussão usado especialmente hoje como objetivos políticos. Mas quando buscamos índices globais, fica fácil perceber como é manipulada a narrativa geral. O resultado e a sugestão do artigo são mudar o horizonte e os objetivos da nova narrativa da INDUSTRY 5.0 para um novo modelo de desenvolvimento socioambiental partindo dos drivers econômicos e evitando a falsa narrativa de um futuro rosa impulsionado pela tecnologia ou da ideologia eco-ambientalista de façade.

Palavras-chave: *Indústria 5.0. Indústria 4.0. Utopia. Novo desenvolvimento social.*

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1. Introduction

Greta Tunberg's[2] naive attempt to discuss environmental issues as an ideological confrontation between pro-environmental young evangelized and “bad people” shows the power of communication against more scientific management of problems and shred decisions. We all know of a general narrative that uses “influencer” methods, or press, social networks, and government-oriented talk shows, to discuss overall more and more environmental “disasters”.

On the opposite side of Tumberg's speech, the governmental paradigm of more technology equals more innovation and progress seems like a product launch and focuses only on the good and the positive of our future in advanced economies. The cause-effect narrative implied that the more technology we get happier and wealthy we are and adding we save the planet. That sound like the same utopia of a sustainable development speech ongoing without any advance for many years. Frankly, it is a result of global economic and social failure.

Moreover, most Public and private managers' attitude is to beware of the bad news and problems and hide social and general impacts (economic regressions or financial bubbles and instability). And there is also another bad general attitude to pass the buck and blame others or events to hide someone's faults. It sounds the following: people must have skills to work unless they have no rights to work when it is the opposite of the economic organization and the government cannot handle the labor market and ensure everyone has the right to have a decent job.

All this implies that someone somewhere creates a new narrative for our future: INDUSTRY 5.0. How to discuss this narrative is the problem and the paper’s objective is to explain this new paradigm and the implications and impacts on the market, products, and labor. Our goal is to prove that the reality is under our eyes and it is less positive than the claim of this new paradigm. The result of the discussion suggests we need a new society before than a new Industry

In our perspective, we will prove the INDUSTRY 5.0 narrative it’s part of a scientific model but rather an ideological and political construction that has its interest like the Tumberg movement. In this sense INDUSTRY 5.0 is not a new step of industry or a new revolution.

2. Research methodology

The paper seeks to explain clearly and simply the galaxy of definitions we are using sometimes with a less understanding of the deep meaning and connections between them.

The paper uses a dialectic approach with an bibliographic exploratory research having the objective to confirm the thesis or a confusion between the utopia narrative opposite to real findings about INDUSTRY 5.0. To show how far is the claimed INDUSTRY 5.0 to reality the bibliographic research uses secondary quantitative data from ONU and other global indexes to have an historical and general continuity of reliable information.

The paper has a sequential step-by-step approach divided into three sections:
a) definitions and explanations of INDUSTRY 5.0 and it is economy
b) the analysis of positive and negative claimed impacts based on the scholar's paper research

[2] Greta Thunberg is a well-known Swedish environmental activist who is known for challenging world leaders to take immediate action for climate change mitigation.

c) reality cases and quantitative findings. A result section and a conclusion will end the paper. We will prove that the INDUSTRY 5.0 narrative is particularly negative when following only, or mostly, political and advertising purposes.

The result of the discussion suggests we need a new society before than a new Industry

3. Discussion and results

3.1 The INDUSTRY 5.0 definition

INDUSTRY 5.0 is a term introduced by Michael Rada (2017)[3] as the next development stage after the fourth Industrial Revolution and refers to an industry where advanced technologies are designed and employed to increase human creativity and innovation. These technologies are artificial intelligence (AI), full automation, quantum computing, and the Internet of Things (IoT). This initial definition wasn't follow by an academic paper but was used by European Union in 2021[4] and many scholar's papers.

Overall it seems a definition very close to the INDUSTRY 4.0 introduced by Klaus Schwab, founder, and executive chairman of the World Economic Forum which defined its fourth era as at combine hardware, software, and biology (cyber-physical systems), and emphasizes advances in communication and connectivity, marked by breakthroughs in emerging technologies in fields such as robotics, artificial intelligence, nanotechnology, quantum computing, biotechnology, the internet of things, the industrial internet of things, decentralized consensus, fifth-generation wireless technologies, 3D printing, and fully autonomous vehicles.

Also, INDUSTRY 5.0 has a vision of our future where machines and technology will work with humans. The emphasis is that INDUSTRY 5.0 enable a new level of collaboration and innovation of new solutions that combine the best of human and machine capabilities. The "new era" will be prioritizing societal requirements of a fundamental emphasis on values such as fairness, honesty, and mutual trust, as well as living together in peace and promoting a comfortable and fulfilling life free from stress, anxiety, and violence. In other words, combining INDUSTRY 4.0 with sustainable development and human rights overall is defined by organizations like ONU.

Following this narrative, the European Commission proposed in 2021 (EU 2021a, 2021b) a definition of Industry 5.0 complementing the Industry 4.0 approach, putting research and innovation at the service of the transition to a sustainable, human-centric, and resilient industry. On September 2021, launched project INDUSTRY 5.0, the world's first waste prevention framework and legislation, was launched simultaneously in 65 countries, and further in September 2022 this Strategic Alliance began its operations.

Establishing an orientation path on new coming economic definitions, it is well-known that all production processes are changing using information technology. We also are changing firms and public administration services delivering to clients and citizens. The third sector of economic activities (services) is today changing very fast and there are changes in the industry that justify a new framework of economic thoughts.

A start to understand industry development is to understand today's economy as an information-driven economy. Many scholars from different knowledge areas including Porat's (1977) initial definition used to define information economy, such as

[3] https://michael-rada.medium.com/industry-5-0-definition-6a2f9922dc48
[4] https://research-and-innovation.ec.europa.eu/research-area/industrial-research-and-innovation/industry-50_en

sociologist M. Castells 1997,T. Boyett. (2001), Negroponte (1996), Rifkin (2000), Schwartz (1999), Shapiro, and Varian. (1999).

The information economy is the economy or part of the economy, where information is valued as a capital good and there is an increased emphasis on informational activities and information industry. The capital good could be materialized as a form of intellectual property (patent, mark certification, etc.) but also as a computer transaction record of someone or an action taken in social media.

The information Economy implies a subset of definitions of new economic activities that identify markets into the sub-general activities set. These are, for example, the Internet of Things (IoT), Artificial Intelligence (AI) based on machine learning or deep learning, Sharing Economy or Circular economy that emphasizes sustainable development vision of the whole development of humans, economics in the planet environment.

Not all these “economies” are based mainly on information and technology information systems. The circular economy according to K. Building's first discussion (1966) and following Ellen McArthur foundation (2020), for instance, has the main focus on the following paradigm: reuse, sharing, repair, refurbishment, remanufacturing, and recycling to create a closed-loop system, reducing the use of resource inputs and the creation of waste, pollution and carbon emissions. The goal of reducing impacts could be reached without massive use of information technology but by using less-impact environmental techniques and technical knowledge focused on low impacts on the environment.

Among these definitions, there is also “Sharing economy” which uses as an important criterion enabling individuals to monetize assets that are not being fully utilized. Following Marcus Felson and Joe L. Spaeth's (1978) all these underutilized assets, such as cars and houses, hardware, toys, and clothing have enabled the massive scaling of peer-to-peer-based transactions that are not dependent on information technologies to grow. However, digital technology allows us to easily match demand and offer, in a short time, and at a lower cost possible.

Then INDUSTRY 5.0 implies a great impact on the production of goods and services. It is the service production activity that is the most impacted by information technologies and is easy to point out financial services as the main impact overall. It is also important to underline the impact on the supply chain even if a distribution is a matter of transportation tools that implies heavy machines, ships, airplanes, and so on only partially automated or fully automated. It is easy to remind science fiction automated machines and think today's machines will be fully automated fast but it implies also a fully automated network of rail, motorways, and airplanes all over the world that is not easy to build and maintain.

In any case, digital information improvements in production processes are a great part of today's and future economy. The information basis that supports the process development is spread all over the world and uses new cloud technologies and quantum computers to support the increase and new demand for computing capacity. New technologies are used to support marketing as AI and machine learning and could be used today as research support as well.

About AI and new analytic technologies that are supposed to link human and machine creativity, it is possible to affirm these technologies are developed and supported by the increase in speed and amount of calculations performed by new hardware using sophisticated software techniques. It doesn’t mean, necessarily, innovation or creativity. If the computing capacity is used only to speed, and increase probability models it seems difficult to claim this is an innovation in the market.

R&D process that needs a creative and cultural background that could hardly be translated into a programming language or retrieved using statistic models. The creative process is a human capacity today not shared with any machine. Basic R&D, or basic research could use the speed and capacity of calculation to progress some models and to determine new fields of research but the research supervision is always a human activity and creativity level not achieved by computers. Moreover, the use of computers or basic results of nanotechnological models has many impacts: ethics, social and environmental that must be discussed.

It seems the INDUSTRY 5.0 impacts are complicated to prove. The impact of new technologies on humans must be defined as all humans and not the "humans" using digital information or involved in new economies such circular and sharing. It is easy to prove the sentience because all over the world exist social organization anachronisms and vulnerability of cultural and social variables (Acemoglu et ali. 2012, Jaffe et ali. 2003, OECD 1999, 2002).

3.2 Analysis of positive and negative claimed impacts: A Summary scholars paper researches

Madsen, D.Ø.; Berg, T (2021) Exploratory bibliometrics analysis on Industry 5.0. provided an understanding of the concept of Industry 5.0. According to the authors, the first article Scopus-indexed was in 2016, and not until 2019, the publication activity started growing. Much of this debate around INDUSTRY 5.0 is happening in the scientific literature, but the definition and discussion slip over social media platforms such as LinkedIn. This proved that new concepts are increasingly taking place on social media platforms to the extent of the diffusion of the concepts using social media influencers that are less reliable but much more known by young evangelists who are seeking celebrity more than consistency.

Research (Akundi, Euresti, Luna, Ankobiah, Lopes, Edinbarough 2022) point out major themes of Industry 5.0 as: a) supply chain evaluation and optimization, b) enterprise innovation and digitization, c) smart and sustainable manufacturing, d) transformation driven by IoT, AI, and e) Big Data, and Human-machine connectivity.

According to the authors (Madsen, D.Ø. Berg, T, 2021), the overall publication trend is positive however, it is not given that INDUSTRY 5.0 will attract more popularity than INDUSTRY 4.0 concept. Most of it will depend on actors (e.g., consulting firms) and government-promoting attitudes in the business considering the long-term objectives concerning sustainability and resilience and it is not particularly attractive for example to SMEs. Research on management concepts had shown that managers are typically attracted to substantial performance improvements, e.g., cost reductions or competitive positions. So consulting firms are not very fond of INDUSTRY 5.0 but there are yuppies evangelists who counterbalance such attitude.

Strong support for INDUSTRY 5.0 was later given by The European Commission which stressed the characteristics beyond producing goods and services for profit, reinforcing stockholders value and the role and the contribution of industry to society. The European Commission in 2021 led by a progressive coalition strongly emphasized sustainability and sustainable development in the business world considering that the concept is related to the UN's sustainable development goals (SDGs) and in some form, the concepts of INDUSTRY 5.0 are more philosophical, human-centered and supporting environment impact reduction. However, European Union has a conflicting vision of sustainable growth of the USA and China, and also other countries of the BRICS group like Brazil.

3.2.1 Expectations about INDUSTRY 5.0

Some scholars (Saniuk, S.; Grabowska, S.; Straka, M. 2022, Daniel Paschek, Anca Mocan, Anca Draghici 2019) underlined the expected impacts of INDUSTRY 5.0 or the positive potential applications such as intelligent healthcare, cloud manufacturing, supply chain management, manufacturing production. People are required to use new competency skills, such as working with advanced robots, and knowledge about smart machines and robot manufacturers. So the expectation is mostly clear to those who is requiring a high level of technical skills.

The adoption of advanced technology reduces working time at least from the perspective of the human workers. So it is expected a reduction of working load during the week at the same salary. It is also expected to use Bitcoin and another new financial forms of investment such as crowdfunding and social investments. And finally, it is expected more security not only for the usage of artificial intelligence and automation i.e. reducing work accidents but mainly threats for to the business and trusted security and privacy concerns.

All expectations could be summarised as reductions of cost of production, namely most opportunity costs of works for workers, reduction of time spent to processing outcomes. However, these expectations carry challenges and open questions. The most negative expectation, excluding an expectation of reallocation of workers for new workplaces that ideologists of INDUSTRY 5.0 will handle, is about the handling of software security, privacy, and non-ethic use of information. It is proven today that inconsistent and stolen information is creating a profitable “black market” and also a commercial use of intellectual property with big data and statistic algorithms that are basic of today's AI is questioned.

But thinking about what could go wrong, here are some negative expectations. We argue it is also doubtful to sustain some author thesis (Santhi and Muthuswamy 2023) of a great differentiation between INDUSTRY 4.0 and 5.0 expectations and hardware and information systems processes. The use of hardware because the human-robot co-working in a factory or a warehouse seems difficult to organize and relocate both humans and robots. The automation, scalability, and skilled workforce theoretically must be divided into human and machine “creativity” and “interests” which are difficult to foresee and establish without “reasonable doubt”.

It seems more logical to another point according to Ghobakhloo et al. (2022) that develop a study through expert panel meetings resulting in an expectation of INDUSTRY 5.0 sustainable development values through variables processes manipulated by functions and models. These functions are highly interrelated and their development should be managed to maximize their synergies and contribution to the intended sustainability values.

Yet another study (Pizon´, J., Gola, A, 2023) developed a technical analysis using the data processing methodology of the VOSViewer software which used a method of counting the type of term weights using full counting, which counts the occurrences of a given term in all processed documents. To understand the analysis must be clear that the result of the research was a co-occurrence map of the terms of the Mining analysis indicating the weight of the given words related to the topics to demonstrate the topics. Four main clusters were distinguished holding the promise of social needs and responsibility for the goods provided are the ultimate goals of manufacturing.

Thus the analysis expectations release more philosophical and intangible expectations than practices and future applications to reach values and quantitative outcomes in the short term.

3.2.2 INDUSTRY 5.0 personalization explication

The analysis of many papers has shown that the most cited articles, most of them from developing countries (Kadir Alpaslan Demira, Gözde Dövena*, Bülent Sezen 2019, Özdemir, V.; Hekim 2018, Haleem, A.; Javaid, M. 2019, Doyle-Kent, M.; Kopacek, P. 2019, Durakbasa, N., Gençyılmaz, M., Eds.; 2020. Nahavandi, S. 2019, Demir, K.A.; Döven, G.; Sezen, B. 2019, Aslam, F.; Aimin, W.; Li, M.; Ur Rehman, K. 2020, Longo, F.; Padovano, A.; Umbrello, S. 2020, ElFar, O.A.; Chang, C.K.; Leong, H.Y.; Peter, A.P.; Chew, K.W.; Show, P.L. 2021, Potocˇan, V.; Mulej, M.; Nedelko, Z. 2020) one of the best positive feature of Industry 5.0 is “personalization”.

In terms of marketing it means something (product or service) that exactly fits the client this implies the design and production of various sensor data directly linked to providing such goods in real-time. But the difference between actual, or INDUSTRY 4.0, and the new paradigm is a high degree of automation increased through human–machine collaboration.

Negative issues of this claimed human-robot co-working and “collaboration” are legal, regulatory, psychological, social, and ethical. It is because the turning point of INDUSTRY 5.0 is changing the role of human resources and information technology departments, what are different personal preferences toward working with robots, how to learn to work with robots, and competing or cooperating with partially or fully automated processes. It is possible to assume the shift towards “personalization” of products and services for many people. That implies cultural and social costs. Cultural because people must educate themselves (it is time and financially costly), but social cost or unemployment is a burden to the public because at least activated funds expenditure to reallocate workers and support unemployment. It seems difficult to relocate all workers excluded in new production processes into new creative activities.

We can't find pieces of evidence of human-machine collaboration for “personalization”. Then there are big questions about personalization. First: “personalization” of what? Is this so important and necessary? Why not have a scale economy and social democratization using standardized goods? That does not imply we must have a planned economy and a communist society, but if we want to reduce the environment's impacts it is better to have more plants and differentiated goods or concentrate on one plant production and reduce processes and raw materials, and the environmental impacts?

3.2.3 INDUSTRY 5.0 Government narrative

A positive impulse for the new form of Industry development could be government policy sustaining. The positive news for the INDUSTRY 5.0 thesis is the Europe Union endorsement claiming a new industrial' development era that fit into sustainable concept and UN development goals (SDGs)[5]. How is doing this is a bit unclear, but there are a shared framework in progress that started in 2021 and a contest with a prize in 2023. The key process to develop in Europe is a transition to a sustainable, human-centric, and resilient European Industry.

According to European Union, the Industry is a key driver in the economic and societal transitions and must lead the digital and green transitions. The EU approach “provides a vision of an industry that aims beyond efficiency and productivity as the sole goals, and reinforces the role and the contribution of industry to society”[6]. INDUSTRY 5.0 places the well-being of the worker at the center of the production process

[5] https://sdgs.un.org/goals
[6] https://research-and-innovation.ec.europa.eu/research-area/industrial-research-and-innovation/industry-50_en

and uses new technologies to provide prosperity beyond jobs and growth while respecting the production limits of the planet.

This is a slight difference vision from the mainstream in which INDUSTRY 5.0 will develop only human-machine industrial development given to collaboration, which also implies that human well-being is a priority as well as the environment for it, but the industry progress, social progress, and environment are sometimes in conflict and the current practice is not going green but to mitigate impacts. This is not a little different and it is different to develop a circular economy or an INDUSTRY 5.0 with only environmental mitigation efforts. This last vision is the technological or ecological more light movement that believes that technology will succeed to substitute high-impact processes and use of natural resources with other inputs (OECD 1999,2002, Jaffe et ali. I 2003, Acemoglu et ali. 2012.).

European Union says that

> "INDUSTRY 4.0 lacks key design and performance dimensions that will be indispensable to make systemic transformation possible and to ensure the necessary decoupling of resource and material use from negative environmental, climate and societal impacts" (EU 2021a pg.5)

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And INDUSTRY 5.0 is related to a new society. So the European narrative new element of the discussion encompasses INDUSTRY 5.0 and sustainable development and socially sustainable development.

According to EUC (2021b pag.9) Society 5.0 and Industry 5.0 are related concepts because both refer to a fundamental shift of our society and economy towards a new paradigm. The Society 5.0 concept was presented by Keidanren, Japan's most important business federation, in 2016. "Society 5.0 attempts to balance economic development with societal resolution and environmental problems. It is not restricted to the manufacturing sector but addresses larger social challenges based on the integration of physical and virtual spaces" (EUC 2021b pag.9). In this Society 5.0, advanced industry tools like IT technologies, the Internet of Things, robots, artificial intelligence, and augmented reality are used for the benefit and convenience of each citizen.

Following the EU there are many elements to be connected in INDUSTRY 5.0 to reach the goals of a new developing economy, such as: a) enabling technologies such as Individualised Human-machine-interaction, Bio-inspired technologies and smart materials, Digital twins and simulation, Data transmission, storage, and analysis technologies, Artificial Intelligence, Technologies for energy efficiency, renewables, storage and autonomy and b) find solutions to challenges like Social dimension of INDUSTRY 5.0, Governmental and political dimension, interdisciplinarity, Economic dimension, scalability.

The political and missionary goal defined is no net emissions of greenhouse gases by 2050, economic growth decoupled from resource use, and no person and no place left behind. So is this the main contribution to INDUSTRY 5.0 discussion from the European Union Associated Government, or to increase the magnitude of the concept to encompass and link the sustainable development speech that generates in Europe with the 1987 Brundtland Report? We must remember that Our Common Future, Chairman's Foreword for "A global agenda for change" was what the World Commission on Environment and Development asked to formulate and discusses in the General Assembly of the United Nations.

Unfortunately, some negative aspects carry by this definition too. First, there is a gap between European Commission and European citizens apart from European bureaucrat's attitudes. Some European decisions, being the Commission itself and the

European Council represent more National government than citizens, overrun national feelings and local reality of most populated countries with a progressive and green evangelism of less populated and richest countries in the North of Europe. In other words, an INDUSTRY 5.0 and a new society are not a priority in some regions of Europe and could be in conflict.

As an example, Greta Tunberg's radical speeches and the new ecologist terrorism in Italy are damaging historical monuments and paintings, raising a strong radical reaction. The reaction increased because many locals are damaged by heavy bureaucracy and green constraints. This is, in our view, part of BREXIT's reaction. The green solution stressed by the sustainable development narrative of the European Council and the support of green terrorism raised a big reaction, including Germany.

In the second and more deep negative aspect, the European Union hasn't the power to make this transition happens without voluntary firms and citizens' attitudes. Moreover, the services provided by European Union and the European National Governments, show weak examples of efficiency, efficacy, and social and green transition. The European Union provides funds (with heavy regulation of use) but also controls European cohesion and final policies that reduce the flexibility of expenditure maneuvers. Every year many countries are appointed for infractions of the fundamentals of the European agreements toward financial stability. The resilience of National Plans is seriously affected by the bureaucratic control system of accounting, not only by the skills to project and plan at a regional level.

According to Aveni (2022, 2023) skills, planning education, and technical tools knowledge lack in many public administration countries and also in European Union when great plans are decided and started. A gap between what "we want to do" and what "we can do" seems not to be perceived or there is overall blinded confidence about directives, plans, and financial markets to fuel the European Economy.

In sum, the European Union's vision of INDUSTRY 5.0 is more theoretical and philosophical than the scholarly concept of personalization and are not aligned with the expectations of all European Citizens (and even some national Government if we see tension with Greece, Poland, and Hungry and even Italy). This is due. of course, because is a politicization of an economic and management narrative restricted to an elite of business, market, and public managers.

By the way, an increasing Keynesian and Welfare State ideology combined with the necessity of broad consensus among the main political leaders results in a combination of conflicting goals, like sustainable development and UN SDGs, difficult to deliver. The justification, in the end, is the "today's advertising struggled anxiety" of the leaders' information broadcasting system to be overtime on top of advertising indexes.

3.3 INDUSTRY 5.0 research of quantitative findings worldwide

Recent reports from UN[7] are thereby used to resume the state of the world from an economic and social point of view. These findings are the best world situation summary and must clarify the impact of INDUSTRY 5.0 in the world giving the light of economic and social increase.

We resume some Key points (UN 2023) :a) The world economy has weak economic growth, stubborn inflation, and rising interest rates in the major developed economies, but. the slowdown in global growth in 2023 is likely to be less severe than previously expected. b) prospects for many developing countries are worst than was projected in January 2022, c) there are underscoring challenges for meeting the SDGs.

[7]https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/WESP_2023_MYU_KeyMessages.pdf and https://www.un.org/development/desa/dpad/publication/world-economic-situation-and-prospects-2023/

Anemic growth in investment, high external debt burdens and rising debt vulnerabilities, growing financing gaps, and simmering geo-political and climate risks portend a prolonged period of subpar growth in the world. d) Labour markets in many developed economies remain tight, marked by low unemployment rates and recurrent worker shortages. e) Inflation will, however, remain well above central banks' targets in many countries, exacerbating in particular the economic well-being of those living in poverty. f) Rising borrowing costs, tighter global financial conditions, and high debt burdens are constraining possible economic fiscal policies of many developing countries. Globally, public debt as a share of GDP continues to be notably higher than before the pandemic, although the gap has narrowed in the last two years due to a withdrawal of fiscal support and some growth recovery g) Policymakers around the world are facing increasing difficult trade-offs between fighting inflation, preserving financial stability and supporting inclusive and sustainable economic recoveries, against the backdrop of lingering uncertainties. h) low economic growth and increasing financing constraints will further limit the ability of governments to invest in education, health, sustainable infrastructure, and energy transition to accelerate progress toward sustainable development.

We stress this last consideration because it seems that the cause of low investment in education, health, sustainable infrastructure, and energy transition to accelerate progress towards sustainable development are low economic growth and financial constraints. We argue that we know these are residual (low rate) investments and expenses in every country that spend on politics, bureaucratic staff and public administration workers, maintenance, energy, and also for defence much more. The decision of the priority of the mix of expenses is the real cause that lower some investment and this priority is not due to economic growth or financial problems. It is a false interpretation of cause-effects to protect the shareholders of the staff responsible for the UN report.

Most incredible is the justification for why the SDGs goals were not reached as planned. According to the UN (2023b), a series of severe and mutually reinforcing shocks struck the world economy in 2022. First, the impacts of the COVID-19 pandemic, second, the war in Ukraine ignited a new crisis, third high inflation unleashed an erosion of real incomes and a global cost-of-living crisis that has pushed millions into poverty and economic hardship.

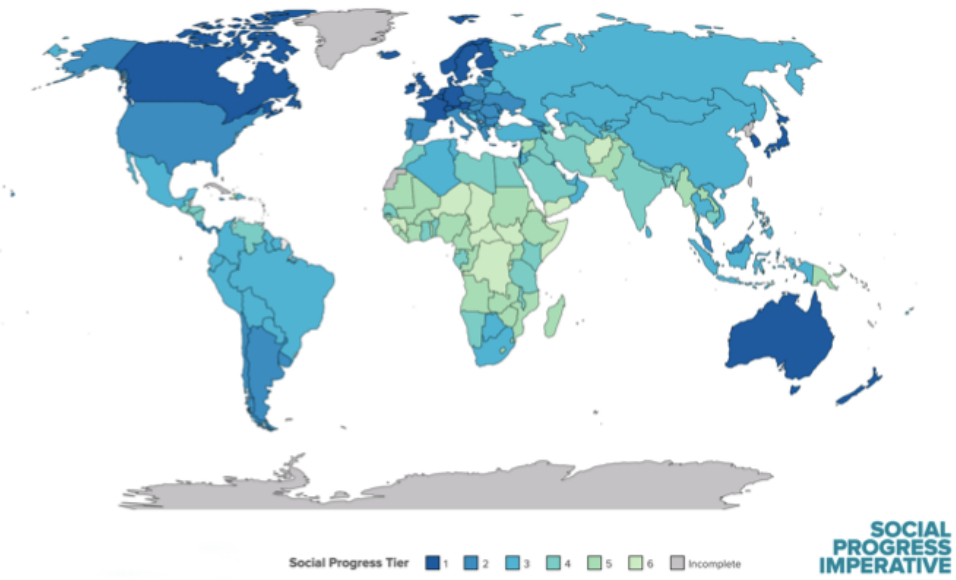
Regarding the environmental situation, there is no explanation but the economic and social pressure why the climate crisis continued to impose a heavy toll, with heat waves, hurricanes with massive economic damages, and generating humanitarian crises in many countries. There is nothing to justify that only economic problems increase environmental problems. An increase in human factors (population increase and appropriation of land as in the Amazon basin in Brazil) or simple climate change, or both could be possible causes of environmental crisis. So it is a social and cultural problem that cannot be changed by technology itself.

But seeking around the world the report segments different situations. First, the Growth in China is forecast to accelerate to 4.8 percent in 2023, but the economy in East Asia remains fragile, although average growth is stronger than in other regions. In 2023, GDP growth in East Asia is forecast to reach 4.4 percent. In South Asia, the economic outlook has significantly deteriorated Average GDP growth is projected to moderate 4.8 per cent in 2023. Growth in India is expected to remain strong at 5.8 percent, The prospects are more challenging for other economies in the region. Bangladesh, Pakistan, and Sri Lanka sought financial assistance from the International Monetary Fund (IMF) in 2022.

In Western Asia, the average growth is projected to be 3.5 percent in 2023. Then it seems there is a growth and this where more than half of the world's population live. In Africa, economic growth is projected to remain subdued with a volatile and uncertain global environment compounding domestic challenges. growth is projected to be 3.8 percent in 2023. Latin America and the Caribbean growth is projected to be only 1.4 percent in 2023 (UN 2023).

To verify a claimed industry good background for INDUSTRY 5.0 we can seek some indexes. The Social Progress Index (SPI) measures the extent to which countries provide for the social and environmental needs of their citizens. Fifty-four indicators in the areas of basic human needs, foundations of well-being, and opportunity to progress show the relative performance of nations. The index is published by the nonprofit Social Progress Imperative and is based on the writings of Amartya Sen, Douglass North, and Joseph Stiglitz.

Figure 1 - Social Progress Index (SPI)



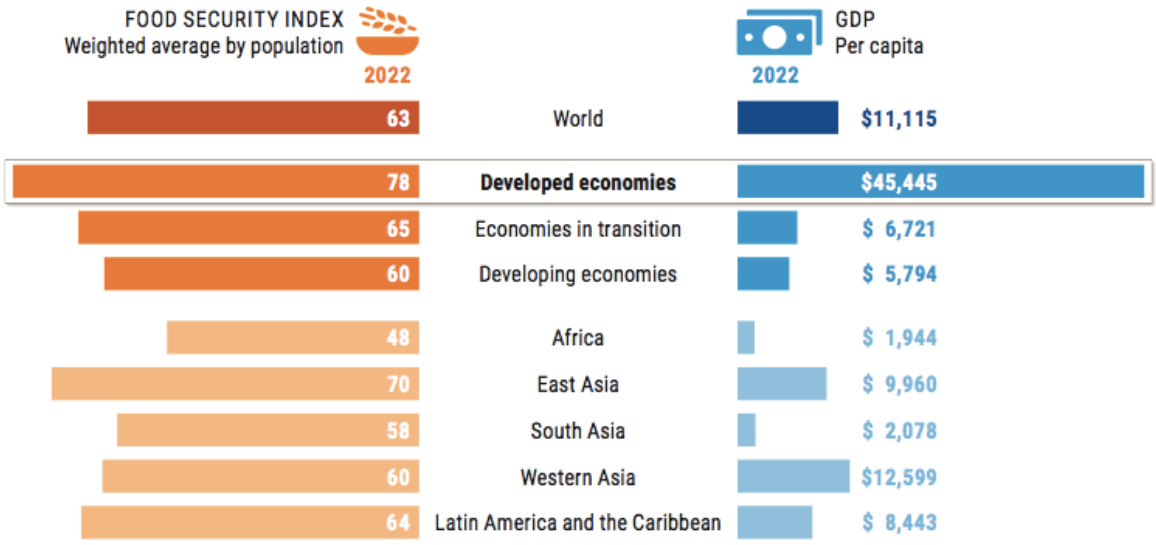
Font: https://assets.website-files.com/5f3eab3adf0948c7d3319877/616fe92837446d5e8ef197d6_TPR-Report-September-2021-v4.pdf

Seeking the social index's best areas and the worst we clearly understand that the majority of the world's population is in a rank from not very good to bad.[8]
Also the Food security index (FSI) [9] shows a situation that scores from bad (Africa) to good (Developed Economies). This index started scoring from the 1996 World Food Summit, and it considers the core issues of affordability, availability, and quality across a set of 113 countries constructed from 28 unique indicators. The overall goal of the index is to assess which countries are most and least vulnerable to food insecurity.

[8] https://assets.website-files.com/5f3eab3adf0948c7d3319877/616fe92837446d5e8ef197d6_TPR-Report-September-2021-v4.pdf and https://drive.google.com/file/d/1Hklyj7PqhN9wYMyBBdi8revt7V2gpM54/view
[9] https://www.unccd.int/resources/knowledge-sharing-system/global-food-security-index

The situation of food security in 2022[10] is claimed to be bad for Africa and generally not good for all parts of the world except for East Asia (basically China, Japan, and Korea in which Japan and South Korea we are confident of the data otherwise for China and North Korea data are doubtful and CHINA is very vulnerable on sustainability and adaptation, quality and safety indexes

Figure 2 - Food security index



font: https://impact.economist.com/sustainability/project/food-security-index/

At last, looking for a connection between the economy and SDGs as claimed by European Council, according to Catalyst Organization 2030 is the date by which the SDGs were to be achieved, but the Social Progress Imperative (SPI) calculates that, even according to the most optimistic assumptions, the SDGs will not be delivered until 2082. Even if we disagree with global organizations' methodology or research it is clear that the paradisiac INDUSTRY 5.0 and the reality are very far away at least it is in part of the world.

It seems the gap between some population clusters - we understand that also in developed countries are vulnerabilities - and the whole world population will increase and we are not converging to a fair average well-being. It seems too that to stress the myth of the technological and industrial main drive to human development is a lie because from the beginning of the INDUSTRY 4.0 “revolution” concept in Hannover in 2011, we are aware of social and environmental problems. Also in 2011, the social and environmental indicators were bad findings of economic stagnation, financial briberies, emigration, refugee increase, etc.

But to link to the information economy and new ways to perceive new trends of activities in the Economy could be useful to research. Also, it was interesting to understand talking about INDUSTRY 4.0 the international sharing of labor and industry.

[10] The Global Food Security Index consists of a set of 18 indices from 113 countries. It measures food security across most of the countries of the world. It was first published in 2012, and is managed and updated annually by The Economist's intelligence unit. https://impact.economist.com/sustainability/project/food-security-index/

China is providing more industrial goods than knowledge financial and immaterial capital than other developed countries. The struggle between USA, Europe, and China is not only strategic but caused by the different labor and production systems of these blocks.

This research is worth the effort when focused on real terms. We argue INDUSTRY 5.0 is not the case. We argue to the INDUSTRY 5.0 narrative with little foundation than a media or political campaign to have election support. That is a warning for all who are willing to solve the problems and not to waste time discussing, as we say in Italy “angel sex” or nuts, and do nothing.

So, then a research is worth the effort when focused to real terms. We argue INDUSTRY 5.0 is not that case. We argue the INDUSTRY 5.0 narrative with a little foundation than a media or political campaign to have election support. This is a warning for all who are willing to solve the problems and not to waste time to discuss, as we say in Italy “angel sex” or nuts, and do nothing.

3.4 Results

As a discussion result, we discussed three main characterizations of the INDUSTRY 5.0 narrative:

- Human-machine integration expectation
- Personalization or the future market and economy are driven by human-machine collaboration
- Government speech and INDUSTRY 5.0 look at sustainable development

We didn’t work on details and specific INDUSTRY 5.0 fields like AI, IoT, etc. because these are implied in the general characterization. It is undoubtedly right we face a lot of tools and progress in information technology but we argue that is early to say there is a “revolution” or even an overall connection and a plan that will deliver for sure a sustainable development and even a shared development with it.

The finding results using global organizations figures like ONU are telling another story. And for people of developed countries that research and travel all over the world it is easy to see and recognize that less or more the majority of world population couldn’t afford new technologies and have skills to use it to change their life. This apart from food and education basic needs as well as the civil and human rights achievement in their counties.

So, the result of the paper is not a negative position about INDUSTRY 5.0 as a concept and utopia but about the manipulation of this utopia narrative and the wrong use of it. First the only reason to lie is to raise political consensus. Second because the research focused information technology use like AI, when for us, the human culture and education increase, is the right path to follow.

In other words, to discuss for instance AI vs Humans it is necessary to understand whether is ethical and useful to apply these new algorithms and techniques to business and social relations. We need semantic and semiotics knowledge or the study of our knowledge and the better way to share it. It looks several thousand years to do it.The AI could be a support but not the solution because it is easy and fast.

4. Concluding remarks

The objective of the paper was to discuss INDUSTRY 5.0 and clarify why is it necessary to research seeking information economy as general theme of the research. Special attention was settled to selecting semantic and concept definitions to be aware of the complexity of the actual economy. The paper explained the connection between definitions and the bulk of INDUSTRY 5.0 characteristics for citizens, market and business, and government.

We find out a wrong narrative of the future and promising goals without strong reality and connections that support and justify the claim of a real trend of human-machine or citizen-sustainable development. Moreover, there are doubts about the goals of INDUSTRY 5.0. The advance of some parts of the economy, mainly information technologies, could not prove there is ongoing an overall plan at least the ones claimed by European Union. An advance of a human-machine-centered economy in today's real world is very far for most countries and citizens. In other words, is an utopia. If so, must be discuss it as a theoretical model not as a reality as was in some academic paper and in European Union.

The results of the initial discussion start from the observation that INDUSTRY 5.0 it's today a virtual discussion of what could be a future than a real "revolution". One must be aware of the danger of free and easy use of complex definitions that enable one to expect from the economy that something could not be delivered, at least the expectation. The same is, as we argue, following the green protest developed early by Greta Tunberg and its freaky movement. They delivered the naive expectation that the protest itself will be able to change today's world system of negotiations and market economy. this results in the dangerous approach of radical eco-protests and conflicts just to be advertised in tabloids.

The limitation of the actual paper research is that it doesn't bring answers to the challenges and issues discussed about developing industry. The result of the work is to alert to semantic and narrative, concepts that are used without necessary care. But it is a necessary alert not to expand the span of new definitions of Industry like four, five, six, seven, and more without justification. The actual information economy is a complex process that needs to be explored and researched before starting new virtual and academic journeys to infinite. We don't need a "star trek voyage" but pragmatic decisions on Earth.

As final suggestion we argue there is the emergence of the increasing priority of a new society definition, before to discuss economic paths. We need to pass the democratic-no-democratic ideology conflict and develop more world integration and plans. INDUSTRY 5.0 is not imperative. It is imperative to dismantle a wrong narrative. What humans themselves must do to live in peace is a priority more than welfare or personal wealth or thinking about what machines and new digitalization forms of work could do.

At last, in our opinion, is the use of technology for all and not the technology itself to be improved. We must develop more ethics and human education than technology which is, unfortunately, opposite to the goals of the INDUSTRY 5.0 proposal from the business and left-wing elite of the European Union and other Nation's faking narratives of progress including Brazil's.

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