Analysis of the Integration and Contribution of the SDGs to equitable global results in the light of Service Design: A scoping review

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Abstract

The construction of the 2030 agenda aims at sustainable, inclusive and collaborative development among countries to challenge them to transpose usual definitions and ideas in favour of equitable actions. To fulfil this purpose, the UN and Member States must assess progress made, obstacles faced and integration between the Sustainable Development Goals (SDGs). Through a scoping review, this study aims to answer the question: How integrated are the SDGs for an equitable global outcome? In the context of Brazil, what is the assessment of engagement and carrying out actions for the performance of the SDGs? What are design contributions to the evolution of the SDGs? The results indicate that in the global context, there remains a reduced collaborative posture, widening the abyss between countries. In Brazil, despite the efforts of the community and public institutions, the actions, supported by design practices and social innovation, are irregular and with evolving self-organization.

Keywords: 2030 Agenda, Evaluation, Design, Sustainable Development Goals.

1. Introduction

A long journey in pursuit of sustainable development with actions coordinated by the United Nations (UN), mainly between 1990 and 2012[1], were the basis for formalising the "2030 Agenda for Sustainable Development" in January 2016. UN initiative involving 193 Member States to determine 17 Sustainable Development Goals (SDGs) and 169 targets. The SDGs should guide public policies and international

[1] All steps in this trajectory can be observed at https://periodicos.uff.br/confluencias/article/view/34665/22955.

cooperation activities under the banner of "leaving no one behind", succeeding and updating the Millennium Development Goals (MDGs). Through an economic, political, social and sustainable process, the Agenda represents the most comprehensive collective effort to increase the equitable quality of life of populations (Moreira et al., 2019; Silva et al., 2020). In Figure 1, we can see the 17 SDGs.

Figure 1. 17 SDG **Source:** United Nations.

For measuring and analyzing the progress of objectives and goals, the results are entered into a global database, enabling individual and integrated follow-ups (Pires et al., 2021), even though such integrations have not been clearly indicated in the text of the Agenda (Bennich et al., 2020). Another relevant factor related to the analysis is the need for more consensus on the definition of sustainability in the existing literature, making the evaluation of sustainability results non-trivial (Caiado, 2018).

The SDGs emerged from the need to make sustainable economic development viable, so that the poorest nations, with the support of more developed nations, would have the means to grow without condemning future generations to a more degraded environment than the current one (Caiado et al., 2018; Silva et al., 2022). It is essential to add that growing intra- and inter-country inequalities regarding disparities in opportunities, wealth, power and development may determine a scenario where some SDGs are out of reach (MDS, 2016).

The deficiencies observed in less developed countries in provoking constant socioeconomic diffusion that promote perennial positive effects on the economy are one of the factors that aggravate pre-existing inequalities, aggravating the dependence of countries on technological and knowledge frontiers (Medeiros, 2020). In this context, the State plays a crucial role in building a solid base of policies guided by the great demands of society for investments in the most dynamic sectors and

drivers of progress, such as, for example, the health area (Gadelha, 2022; Gadelha et al., 2013).

In the Brazilian scenario, such are the vulnerabilities with regard to national development, whether in the field of health, education, the productive sector and technological innovation, which can be justified by the historical industrial and technological backwardness and the low connection between the research infrastructure and the sector productive, placing Brazil among the so-called “immature innovation systems” (Medeiros, 2020; Bencke et al., 2018).

In order to reduce global gaps, the 2030 Agenda, through the SDGs, provides for partnerships in favour of international cooperation to promote development using the transfer of knowledge and technology as a tool. In this way, it expands capabilities and mitigates systemic issues in sensitive areas such as health, science, education, sustainable industrial development, technology and innovation (MDS, 2016). However, it is known that a greater effort to fulfil the SDGs falls to countries classified as 'developing' and 'poor', where, in most of them, national budgets have not been able to boost the proposed development, especially when subjected to policies spending restrictions, reducing the role of the State and restricting investments (Moreira et al., 2019).

Given the above, the objective of this research is to identify actions and analytical studies regarding the advancement of the SDGs, their possible integrations for equitable results and the contribution of design and social innovation to these results.

To this end, a literature scope review was used based on the following guiding questions: How integrated are the SDGs for an equitable global outcome? In the context of Brazil, what is the assessment of engagement and carrying out actions for the performance of the SDGs? What are design contributions to the evolution of the SDGs?

The analysis carried out considered the research gaps delimited under the aspects of the breadth of the concept of sustainability, the low number of institutions focused on the measurement and publication of performance results of the SDGs and the lack of definition in the very formulation of the 2030 Agenda about integration and metrics for measurement of SDG performance.

In addition to this introduction, which contextualizes the study, the following sections present the methodology, which explains the research analysis procedures, the exposition of the results, as well as their analysis; moving forward with completion; and, finally, the references included in the study.

2. Research method

This study refers to a scoping review by Peters et al. (2020, p. 2121) that " are more appropriate to assess and understand the extent of knowledge in an emerging field or to identify, map, report or discuss the characteristics or concepts of that field". The survey of bibliographic data took place in October 2022, according to the steps described below:

1st. Step - Research strategy: Based on the guiding questions, the following keywords were used with no time restriction. In Scopus Bases, Web of Science: "Agenda 2030" AND "assessment" OR "analysis" OR "integration" AND "sustainable development objectives", whose terms searched in the titles, summaries, *abstracts* and keywords. It is important to highlight that the words AND and OR of the expression were strategically adopted to guarantee the greatest number of productions.

2nd Step - The criteria:

- The first exclusion criterion was applied to retrieve only articles classified as Article and Review due to the relevance of the works, considering articles in English and Portuguese.
- The second exclusion criterion was characterized by reading the abstract in order to identify studies that directly contributed to the answer to the guiding question in such a way as to select the sources to be effectively used.

3rd. Step - Data synthesis: A synthesis of the main information of the selected articles was carried out using the Microsoft Excel® program for subsequent reading in full.

4th Step - Search in other complementary sources: Due to the research limitation determined by the low number of publications in the databases described above, it was essential to search in other complementary sources so that there was sufficient analysis. Therefore, the search strategy in the Google Scholar base was based on the keywords: Group 1: "Agenda 2030", "Evaluation" and "SDGs"; Group 2: "Agenda 2030", "Analysis" and "SDGs"; Group 3: "Agenda 2030", "Integration" and "SDGs"; Group 4: "Design" or "ODS" or "Social innovation". As well as consulting official websites and grey literature[2] to identify reports and specific results for the defined

[2] It is any document that is generally not formally or commercially published, which makes its retrieval, reproduction, or citation difficult. Source: VIGHNESH, D. (2021). grey literature and their sources. Cochrane Blog. Retrieved from https://s4be.cochrane.org/blog/2021/05/07/grey-literature-and-their-sources/ .

objectives. Also, due to the relevance and citations found in the articles, a book was inserted as a source of study.

In Figure 2, the aforementioned bibliographic survey is presented.

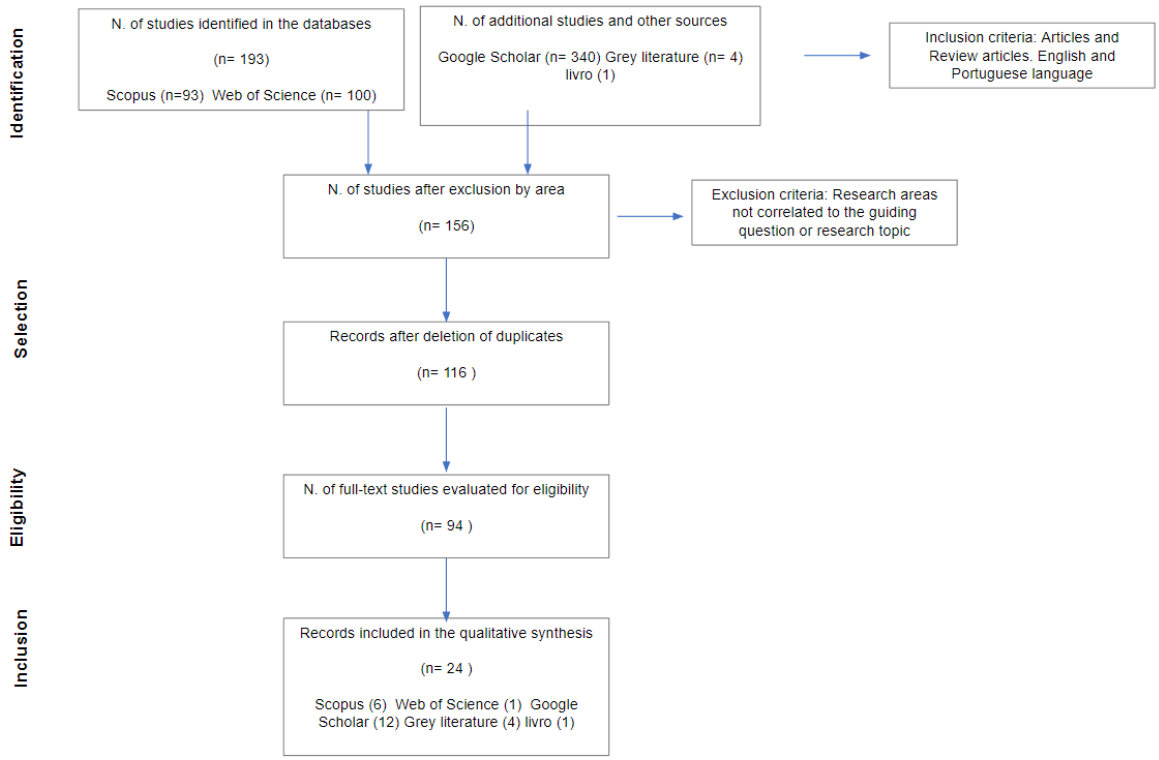

Figure 2. Flowchart, based on the model Moher et al. (2014), The PRISMA Group. **Source:** Prepared by the authors.

Of the 94 articles identified and selected respecting the search strategy and inclusion and exclusion criteria, as explained in Chapter 2, 24 represent the articles included as a reference. Of these, 46% are English-speaking and 54% are Portuguese-speaking. According to the analyzed bases, five articles did not present any citations. The average citation among the articles used is 27, highlighting the publication " literature-based review on potentials and constraints in the implementation of the sustainable development goals "with 190 citations. The inclusion of grey literature articles was necessary, mainly given the publication of follow-up reports on the development of the SDGs. The details of the articles included are described in Table 1.

Author	Title	Year	Quote	Base	Language	Country
Silva et al.	Assessment of governance in the implementation of the SDGs: Bibliographic survey of theoretical contributions to the theme (2015-2021)	2022	2	Gray literature (RDSjournal.org)	English	Brazil
BNDES	Relatório de efetividade 2020-2021	2022	0	Google Scholar	Portuguese	Brazil
Pires et al	Strategies to reach global sustainability should take better account of ecosystem services	2021	5	Scopus	English	Brazil
Ramiro	As Agendas ODS no Plano Plurianual 2016-2019	2021	1	Google Scholar	Portuguese	Brazil
Relatório Luz	V Relatório Luz da Sociedade Civil - Agenda 2030 de desenvolvimento sustentável Brasil	2021	0	Gray literature (gtagenda2030.org)	Portuguese	Brazil
Chou	A Scoping Review of Ontologies Relevant to Design Strategies in Response to the UN Sustainable Development Goals (SDGs)	2021	5	Google Scholar	English	Switzerland
Gaertner et al.	Alinhamento de Pesquisas Científicas com os ODS da Agenda 2030: Um Recorte Territorial	2021	1	Scopus	Portuguese	Brazil
Breuner	Horizontal Accountability for SDG Implementation: A Comparative Cross-National Analysis of Emerging National Accountability Regimes.	2021	2	Scopus	English	Germany
Bennich et al.	Deciphering the scientific literature on SDG interactions: A review and reading guide	2020	40	Web of Science	English	Switzerland
Moreira et al.	Brazil in 2030? Brazilian health specialists' perceptions of the country's potential to comply with the Brazil heading to 2030	2020	1	Google Scholar	English	Brazil
Barbalho & Engler	Design de Serviços para a Inovação Social: Um estudo de caso sobre design, serviços relacionais e desenvolvimento sustentável	2020	3	Google Scholar	Portuguese	Brazil
Donaires et al.	Sustainable development goals – an analysis of outcomes	2019	14	Scopus	English	Brazil
De Assis & Nunes	Inovação Social: Estudo sobre um modelo de identificação e sua relação com os objetivos do Desenvolvimento Sustentável	2019	2	Google Scholar	Portuguese	Brazil
Caiado et al.	Literature-based review on potentials and constraints in the implementation of the sustainable development goals	2018	190	Scopus	English	United Kingdom
Costa	Como Avaliar o Alcance dos Objetivos de Desenvolvimento Sustentável? Desafios e Possibilidades para a Agenda Global de Avaliação	2018	7	Google Scholar	Portuguese	Brazil
Calabrese et al.	Fostering sustainability-oriented service innovation (SOSI) through business model renewal: The SOSI tool.	2018	45	Google Scholar	English	United Kingdom
Cumming et al.	Critical discourse analysis of perspectives on knowledge and the knowledge society within the Sustainable Development Goals	2017	28	Scopus	English	Reino Unido
Bezzon	Objetivos de desenvolvimento sustentável: uma avaliação dos indicadores do Brasil.	2017	0	Google Scholar	Portuguese	Brazil
Gomes	Indústria, Inovação e Infraestrutura: Ações para o desenvolvimento sustentável no core de produção	2017	0	Google Scholar	Portuguese	Brazil
Manzini	Quando todos fazem design: uma introdução do design para a inovação social	2017	105	Livro	Portuguese	Brazil
Ministério da Cidadania	Transformando nosso mundo: A Agenda 2030 para o desenvolvimento sustentável	2016	77	Gray literature (mds.gov.br)	Portuguese	Brazil
Cipolla et al.	Service design for social innovation: the promotion of active aging in Rio De Janeiro	2016	3	Google Scholar	English	Denmark
Pietricovsky	Caminhos percorridos da Rio 92 à Pós-2015	2014	0	gray literature (INESC.orga)	Portuguese	Brazil
Chiarini e Vieira	Universidades como Produtoras de Conhecimento para o Desenvolvimento Econômico: Sistema Superior de Ensino e as Políticas de CT&I	2012	112	Google Scholar	Portuguese	Brazil

Table 1. Articles included in the scope review **Source:** Prepared by the authors.

In order to reach the objective of the research, the analysis sought to identify the convergences and divergences on this theme, as well as answer the objective of the research.

3. Results

The exposition of the research results is described below to answer the guiding questions of this research. In such a way, subchapters 3.1, 3.2, 3.2.1 and 3.2.2 describe elements capable of promoting discussion in compliance with the objective delimited in the study.

3.1. Integration between the SDGs

The concentration of power and wealth between countries, which consequently increases inequalities, needs to be sufficiently attacked in the 2030 Agenda; there are no explicit targets for reversing the situation (Pietricovsky, 2014) or measuring equity. The use of technology is still focused on a commercial perspective, specifically in the private sector. And research budgets are not strategically fixed to support sustainable development goals (Moreira et al., 2019).

Moreira et al. (2019). Such obstacles guided the SDGs in the 2030 Agenda and are still unsurpassed challenges (Moreira et al., 2019), being points with direct influence on the Interaction studies of the SDGs.

Although there is no general agreement on what defines an integrated approach, the perspective is defended that integrated and coherent policies can optimize the use of resources and generate more sustainable results avoiding contrary objectives and incentives. Consequently, such integration would spill over into political, economic and social innovation, supported by an effective design to overcome emerging political paradigms and to provide services with greater efficiency, reduced costs and return to society. (Bennich et al., 2020).

3.1.1. Global Integration Scenario

As a source of analysis about global integration, Pires et al. (2021) analyzed the Sustainable Database Development Solutions Network from 2017 to 2019, focusing on investigating caveats and opportunities for cooperation. As a general assessment, the authors conclude that despite significant progress in recent years, the 2030 Agenda is still based on individual and not global performance since current efforts are leading to competition and lack of support between countries, widening the gap between them. They also highlight that most sustainability studies focus on the

interaction between goals but do not explain the mechanisms that sustain potential antagonisms and how this compromises global sustainability.

In the conceptual model established in their analysis, Pires et al. (2021), determine five different stages for sustainability classification: I) Stable (countries that reached optimal values of sustainability indicators and continue to improve them); II) Emerging (countries improve their values of sustainability indicators, but still need efforts to achieve sustainability); III) Unstable (countries have achieved optimal values for sustainability indicators, but are showing declining performance); IV) Submerged (countries present minimum sustainability conditions and have decreasing performance) and; V) Collapse (countries that already present very critical conditions and have worse performance).

In this study, it is noted that despite the wide variation in the performance of the countries, there was a significant global reduction in the targets related to Poverty (SDG 1), Health (SDG 3), Water and Sanitation (SDG 6), Inequality (SDG 10) and Sustainable Cities (SDG 11). And, is a significant improvement in the global performance of the Social Agendas (ODS 2, 4, 5, 7 and 16), Economic (8, 9 and 12) and Environmental (13, 14 and 15), these being the locus goals of the main global agreements. Therefore, the increases in human demand for certain ecosystem services and urbanization were assumed as contributory factors for these results.

As for integration, the research lists SDGs 8, 11, 12 and 13 as responsible for a negative integration, while SDGs 1, 3, 6, 16 and 17 have a predominantly synergistic effect with other sustainability agendas. Important components of sustainable development such as gender balance (SDG 5), reducing inequality (10) and conserving biodiversity (14, 15) remain uncoupled with no precise interactions with other SDGs.

The identification of a negative correlation in the behaviour of the SDGs reflects the persistence of a traditionalist economic and business development model contrary to sustainability goals. Pires et al. (2021) add that the behaviour of emerging and developing countries, most of them centred on the collapsing sustainability region and classified in the research as submerged, will be crucial to guarantee well-being on a global scale and that the direct transfer of assets transformers, such as technology.

3.1.2. Brazil Scenario

In the Brazil scenario, Donaires et al. (2019) point to integration based on data entered in the World Bank's Word Development Indicators over the past 25 years. In this research, an analytical perspective focused on national efforts regarding self-

assessment for sustainability was used. As a general result, the authors point out that Brazil, until the moment of the research, cannot be seen as a self-organized system in the evolution towards sustainability, with its irregular efforts.

The matrix presented as an analysis method determined a robust and relevant integration between SDGs 1-10, mainly in the dimensions "No poverty", "Zero Hunger", "Good health and well-being", "Quality education", "Gender equality", and "Clean water and sanitation". The data also pointed to a tendency towards self-organization to achieve goals, and systemic results with other objectives (9, 11, 14 and 15), just as they are associated with the construction of public policies. (Donaires et al., 2019).

However, the study also presents results with negative or weak integration regarding: SDG 17 - with almost all other variables making clear the difficulty of integrating efforts towards sustainability as a viable system; SDG 12 - meaning that efforts made at lower levels of recursion may not be linked to overall results and; SDG 9 - leading to the understanding that increasing technology and markets are not necessarily adding to systemic progress.

3.2. Implementation of the 2030 Agenda in Brazil

To promote and implement the 2030 Agenda, even with disjointed and belated implementation, the National Commission for Sustainable Development Goals (CNODS) was instituted by means of Decree No. of Applied Economic Research (IPEA) and the Brazilian Institute of Geography and Statistics (IBGE).

However, due to political instability, since 2016, this commission was extinguished in 2019 by Decree No. 10,179 of December 18, 2019, marking the withdrawal of the federal government from the 2030 Agenda. In this way, without a proposal for an alternative strategy and long-term planning vision, they directly influenced the Pluriannual Plan (PPA) for the period between 2016-2019 (Ramiro, 2021).

Added to this is Constitutional Amendment 95, which clearly worsened the health scenario with the allocation of ever-decreasing government funding. And, Ordinance No. 2.97918 of the Ministry of Health, which instituted the Previne Brasil Program, breaking the principles of universality, equity and integrality of the Unified Health System (SUS), added to the difficulty of access to the vaccine against Covid-19 in the period recent pandemic (Report Luz, 2022).

Despite the potential, Moreira et al. (2019) identify Brazil's disbelief in meeting the SDGs mainly due to the factors of 'poor quality in health management' and 'corruption in the health system' and its interconnection with "Education" focused on

training of health system professionals. However, there needs to be a clear indication of the direct integration between these objectives.

It is known that Higher Education Institutions (HEIs) play a vital role in training human resources, generating transdisciplinary technical-scientific knowledge and implementing policies for socioeconomic development in the context of Innovation Systems. In this system, the university-company relationship fosters knowledge spillovers from research, creating muscle for the development of new products, services and processes, even though in Brazil, there are gaps between scientific production and effective technological innovation (Caiado et al., 2018; Cummings et al., 2017; Chiarini & Vieira, 2012).

Nevertheless, obstacles are revealed in terms of how science is conceived and relates to education, hindering the interdisciplinarity needed to promote more integrated ways of thinking about coping with complex issues in society, as well as the symbiotic relationship between the effects of education in political and social processes (Caiado, 2018; Gaertner, 2021).

Sustainable development is associated with the promotion of infrastructure development, industrialization and innovation (SDG 9) at affordable and egalitarian prices to promote inclusive and sustainable industrialization. No country that has reached a high stage of economic and social development has done so without having developed an advanced industrial sector. However, inclusive and sustainable industrialization requires the industry to develop a strategy that accepts and understands its responsibility towards society and the environment (Bezzon, 2017).

Just as infrastructure provides basic and essential physical facilities to companies and society, according to Gomes (2017), industrialization drives economic growth and job creation, and innovation expands technological capabilities. In this way, investment in technology and sustainable solutions is among the main solutions to combat the impacts of the industry and its impact on health care (SDG 3) and access to education (SDG 4). It starts, therefore, from the principle that in the recognition of technology, through the partnership (SDG 17) of the more developed countries with the less developed ones, national and global economic growth is achieved.

The performance of these critical SDGs (3, 4, 7, 9 and 17) and drivers of development are explained in the following subchapter.

3.2.1. Performance Reports: SDG drivers for development

Discussions related to monitoring the SDGs address the importance of governance and the relationship and coherence between the commitment to the SDGs and public

policies in the short, medium and long term. However, the 2030 Agenda itself does not provide guidance on how the SDGs interact or how to assess these interactions. However, it is possible to understand a holistic relationship between the social, economic, environmental and institutional spheres in favour of balancing the relationship between man and the environment (Bennich et al., 2020; Silva et al., 2022).

Assessing the SDGs is an essential task for the UN and Member States, as is the production and use of quality data essential for assessment and monitoring. However, there is a lack of studies on political innovation, monitoring and systemic thinking, which also take into account the limits and overflows of territories, which may lead to inefficient implementation of the SDGs and delay the achievement of goals (Bennich et al., 2020; Caiado et al., 2018).

There is a clear challenge in monitoring the implementation of the SDGs regarding the availability of raw global databases comparable in a detailed and credible way with regular time intervals. This fact leads to a scarce analytical production of indicator-indicator interactions (Bennich et al., 2020; Caiado et al., 2018). This scenario can be attributed to the neglect of accountability where in many places, civil society organizations filled this gap (Breuner & Leininger, 2021).

As an example, the V Luz da Sociedade Civil Agenda 2030 Report (GTSC A2030), in 2021, was composed of a coalition of non-governmental organizations, social movements, forums, networks, universities, foundations and Brazilian federations. The study was based on target indicators appropriate to the Brazilian reality, considering available official data, civil society studies or research on academic bases. Although Brazil fails to provide information on the progress of some sectors, not being possible to obtain data on 4.76% of the targets; more than 80% of the targets are in the process of non-compliance (Relatório Luz, 2021).

According to this same report, it is important to highlight that in the goals related to health and education, Covid-19 has aggravated the challenge of vaccination, made the anti-vaccination groups advance and potentializes a setback in meeting the goal (in 2019, the vaccination coverage rate of the Brazilian population was 45.65% against 71% in 2018). According to data from the Department of Informatics of the Unified Health System (DATASUS)[3], the vaccination coverage of the population is in decline, reaching 67.80% in 2022. The level recommended by the Ministry of Health is 95% established by the National Immunization Program (PNI) under the auspices of Law No.

[3] Source: http://tabnet.datasus.gov.br/cgi/webtabx.exe?bd_pni/cpnibr.def.

In education, around 4.3 and 4.4 million students were affected by the low or lack of infrastructure for distance education during the pandemic period. The Federal Government fully vetoed this result in the bill approved by the National Congress (PL 3,477/2020) to ensure the allocation of resources for free internet access for teachers and students (Relatório Luz, 2021; BNDES 2022).

As for industry and innovation, there was a migration from the status of “stagnant” in 2020 to “regression” in 2021. This change, according to the evaluators, is due to substantial cuts in the budgets for scientific, technological and engineering development. Therefore, the poor performance of the country in the global innovation index is established, occupying the 62nd position among 131 economies. In this analysis, the low sophistication of business and the lack of qualified human capital are presented as the biggest obstacle, revealing the unfolding of problems related to educational infrastructure (Relatório Luz, 2021).

The evaluation of partnerships is seen as something still incipient, but with potential for growth, even though Law no. 13,019 establishes the legal framework for partnerships between the public administration and civil society organizations on a mutual cooperation basis, substantially amended in 2015, allowing for a significant reduction in resources for the area (Relatório Luz, 2021).

These results are not only avoidable consequences of the economic crisis and the pandemic but are also the result of political choices and coordination and monitoring mechanisms that make it difficult to measure results and propose corrective actions (Costa, 2018).

In the search for the integration of the SDGs, service design acts as a promoter of systemic solutions for all the actors involved, people, organizations, territories, the economy and the environment (Cipolla et al., 2016), in compliance with the geographic borders and their respective externalities in different contexts, reinforcing the idea of co-benefits in a socioecological dynamic (Bennich et al., 2020). Next, possible contributions of service design and its approach to social innovation applied to sustainable development are highlighted.

3.2.2. Brazil: Actions of the 2030 Agenda in the light of Design (products and Services) and Social Innovation

Social changes are the result of initiatives to promote development. One way of observing the evolution of such initiatives is the Human Development Index (HDI), which measures the quality of life and economic development of a location based on criteria such as health, education and income. In the Brazilian scenario, in 2014, Brazil occupied the 75th position in the global ranking of HDI; in 2020, it occupied the

73rd position, and in the last report generated in 2021/2022, it occupied the 87th position in the ranking among 191 countries.

This oscillation reinforces the importance of connecting initiatives, as declared by the SDGs. However, the way in which these initiatives will be implemented will depend on the ability to carry them out, highlighting the role of service design in offering solutions by proposing viable and sustainable low-cost and high-impact scenarios (De Assis & Nunes, 2019). Service design, together with social innovation, promotes changes towards sustainability (Manzini, 2017), resulting in social dialogue and systemic and transformative changes (Barbalho & Engler, 2020).

Practices applied in Brazil and around the world contribute to effecting changes in society, especially in emerging and low-income contexts, for the disruption of traditional economic models (De Assis & Nunes, 2019). However, both in developing and developed countries, there is still a lack of tools to highlight the innovation potential of the SDGs for companies and to explore their opportunities for value creation (Calabrese et al., 2018).

Even so, it is possible to highlight the crucial role of design in services, especially in emerging countries, as a means of correcting economic reductionism and promoting social innovation. Here are examples of actions conducted by the citizen community, Água Camelo[4], Aqualuz[5] and Cocozap[6], and actions by institutions gathered in the National Award for the Sustainable Development Goals (ODS Brazil Award) such as the Rede Cegonha [7]and Água para Todos programs: cisterns[8].

From a design perspective, Chou (2021, p.1) mentions that “academy and industry have taken steps to seek how to address the Sustainable Development Goals (SDGs) through research, practice and community involvement”, going through the four domains presented in the study, namely: human, economic, social and environmental. In this study, in the 110 evaluated product and service design strategies, possible correlations with the goals and indicators of the SDGs were observed, where most of the corresponding strategies are viable for objectives 3, 4, 6 and 7, to a certain extent, and, in a broad sense, they are contextually aligned with objectives 1, 2, 5, 10, 13 and 14, as shown in table 2.

[4] Startup com in promoting access to a safe source of treated water for people in socially vulnerable situations.
[5]Device for disinfecting water from rainwater harvesting cisterns in rural areas using solar radiation.
[6]data.labe ' project for mapping, advocacy and citizen participation on basic sanitation in favelas.
[7]Package of actions to ensure quality, safe and humane care for all women.
[8]The National Support Program for Rainwater Harvesting and Other Social Technologies.

Domains	Strategy	Goal
Human	Human Factors and Ergonomics (HFE)/Human-Centered Design (HCD)/User-Centered Design (UCD)/ Quality Function Deployment (QFD)/Kansei Engineering (KE)/Axiomatic Design (AxD)/Design Structure Matrix (DSM)/Adaptable Design (AD)/Empathic Design (ED)/Disability-Specific Design (DSD)/Barrier-Free Design (BFD)/Accessible Design (AcD)/Universal Design (UD)/Design for All (DFA)/Inclusive Design (ID)/User-Sensitive Inclusive Design (USID)/Design for User Empowerment (DUE)/Ability-Based Design (ABD)/Human–Computer Interaction (HCI)/Interaction Design (IxD)/Usability Engineering (UE)/Contextual Design (CD')/Participatory Design (PD)/User Experience Design (UXD)	Goal 3; Goal 5; Goal 10
Economy	Taguchi Method (TM)/Failure Mode and Effect Analysis (FMEA)/Concurrent Engineering (CE)/Collaborative Engineering (CE II)/Modular Product Design (MPD)/Reverse Engineering (RE)/Computer-Aided Design (CAD)/Computer-Aided Manufacturing (CAM)/Computer-Aided Engineering (CAE)/Computer-Aided Process Planning (CAPP)/Computer-Integrated Manufacturing (CIM)/ Design for Manufacturing (DfM)/Design for Assembly (DfA)/Design for Modularity (DfMo)/Design for Availability (DfAv)/Design for Cost (DfC)/Design for Reliability (DfR)/Design for Adaptability (DfAd)/Design for Quality (DfQ)/Design for Variety (DfV)/Design for Variation (DfVa)/TRIZ (Theory of Inventive Problem Solving)	Goal 11
Social	Social Design (SD')/Socially Responsive Design (SRD II)/Socially Responsible Design (SRD)/Ethical Design (ED')/Design Anthropology (DA)/Design Activism (DAc)/Design for Well-Being (DFW)j/Social Product Development (SPD)/Design for Social Inclusion (DfSIn)/Design for Social Change (DfSC)/Design for Social Impact (DfSIm)/Social Impact Assessments (SIA)/Social Life Cycle Assessments (SLCA)/Design for Social Innovation (DfSI)/ISO 26000	Goal 1; Goal 2; Goal3; Goal 4; Goal 5; Goal 10;Goal 3; Goal 11
Envirommental	End-of-Pipe (EoP)/Product Stewardship (PS)/Regenerative Design (RD)/Green Design (GD)/Eco-Design (EcD)/Cradle-to-Cradle Design (C2C)/Sustainable Design (SD)/Emotionally Durable Design (EDD)/Design for Sustainable Behavior (DfSB)/Biomimetic Design (BD)/Ecological Product Design (EPD)/Industrial Ecology (IE)/Product Ecology (PE)/Environmentally Conscious Design (ECD)/Life Cycle Design (LCD)/ Design for Disassembly (DfD)/Design for Reuse (DfRu)/Design for Recycling (DfR)/Design for Maintenance/Design for Maintainability (DfMa)/Design for Supportability (DfSu)/Design for Recovery (DfRc)/Design for Service/Design for Serviceability (DfS)/Design for Life Cycle (DfLC)/Design for Environment (DfE)/Design for Sustainability (D4S)/Product-Service Systems (PSS)/Circular Design (CD)/Circular Product Design (CPD)/Life Cycle Management (LCM)/Life Cycle/ Assessment/Analysis (LCA)/Life Cycle Costing (LCC)/Life Cycle Sustainability Analysis (LCSA)/Life Cycle Inventory Analysis (LCI)/ Life Cycle Impact Assessment (LCIA)/Life Cycle Engineering (LCE)/Screening Life Cycle Modelling (SLCM)/BS 8887-3 (2018)/UNE 150,008 (2008)/IEC 62,430 (2019)/ISO 14,006 (2020)/ISO 14,040 series/ISO 14,091 (2021)/Environmentally Responsible Product Assessment Matrix (ERPA)/MECO Method/ Life Cycle Design Strategy (LiDS)/EcoCompass(EcC)/EcoDesign Checklist (EcDC)/MET-Matrix/ Product Ideas Tree (PIT) Diagram/STRETCH/Eco-Indicators (Eci)/Ecodesign Pilot (EcDP)	Goal 9; Goal 11; Goal 12;Goal 13

Table 2. Design strategies aligned with the SDGs. **Source:** Adapted from Chou (2021).

In the following discussion, reflections are presented on the results presented regarding the integration between the SDGs, limits and opportunities from innovation and service design, especially in the Brazilian scenario.

4. Discussion

Although there is a limitation of definition and metrics regarding the integration of the SDGs in the 2030 Agenda, recent productions were identified, with a significant number of citations, which could bring basic elements to this discussion.

The SDGs and their associated targets constitute a complicated web of interconnections that are not constant and immutable but can be defined by causality or by other types of relationships/situations. That said, the 2030 Agenda proposal indicates the urgent transformation of traditional models and the implementation of effective systemic and innovative actions to overcome global challenges.

In a general view, a low integration in the behaviour of the SDGs given the maintenance of the current economic and business development model structured in such a way as to generate conditions of inequality. The influence of the geopolitical

landscape, political disconnection and lack of implementation capacity, particularly in low-income countries, which require better support and leadership from larger states, call for a new narrative to communicate and a globally coordinated and more participatory scientific implementation effort to pursue the SDGs.

In Brazil, with late implementation of the 2030 Agenda, irregular efforts and no systemic organization of results are observed. With the recent political and legislative facts and the impacts of the pandemic scenario as an aggravating factor, efforts seem to be more focused on the social dimensions of sustainability, given the practical uses of social innovation and service design highlighted in society's actions and ODS Brazil Award, such as education, health and poverty eradication. While economic (industry, innovation and investments) and ecological dimensions do not seem to show promising results, crystallizing the national historical scenario.

The studies analyzed in this research trigger slow progress of the SDGs and divergent evolutionary differences in the global and national comparison given the economic, political and social aspects. It is vital to strengthen integration with effective actions in the light of design and social innovation, supported by an essential monitoring and evaluation structure to measure interventions and their impact on equity at the global and national levels.

In this context, service design, as a locus of social innovation actions in response to the SDGs, becomes an important key to globally integrated and co-creation solutions adapted to local contexts in favour of equitable and sustainable development. Design strategies, especially service ones, directly address SDG social development issues, capable of articulating dynamics that deal with the complexity, diversity and variability of social characteristics with different impacts.

This understanding highlights the importance of services for more effective transitions in the 2030 Agenda since services are the main form of value creation by public authorities and articulation with society. Integrated and user-centered public sectors, with participatory projects and a systemic and inclusive design perspective, outline ways to local and globally equitable solutions, considering territorial differences and the enormous challenges of emerging countries.

5. Conclusion

The integration of the SDGs for an equitable global result is linked to the fact that the SDGs transcend the conception of ambitious goals, becoming critical for our survival, with the need for rapid implementation falling to governments. However, the actions

arising from this Agenda privilege individual efforts, expanding the vision of competition and the abyss between countries, as well as antagonisms that compromise global sustainability.

The path towards a sustainable development model lies, in greater weight, in cooperation between countries and greater synergy between the SDGs, supported by governance guidelines and integrated and coherent public policies, in order to generate equitable and lasting results. In the Brazilian scenario, the assessment of engagement and actions for the SDGs' performance is permeated by the reflection of the lack or discontinuity of these guidelines, added by the late implementation of the 2030 Agenda, constituting determinants for an irregular self-organized system in evolution towards sustainability.

Therefore, accelerating the implementation of the SDGs requires a systemic, collaborative and inclusive approach. These approaches are identified in the contributions of design and social innovation, led by the community and public institutions, to the evolution of the SDGs and promoters of sustainable political and social change. However, it is observed that in the countries, there is still little use and application in the broadest sense of these practices.

As a contribution to future research, we highlight the gaps in the proposal of mechanisms for measuring and analyzing the integration of the SDGs in the dimensions of governance, systemic thinking and sustainability and design actions and social innovation, aiming at a deeper investigation of the dynamics of cause and effect to obtain equitable overall results.

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