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Big Tech Corporations and AI: A Social License to Operate and Multi-Stakeholder Partnerships in the Digital Age

Marianna Capasso and Steven Umbrello

Abstract The pervasiveness of AI-empowered technologies across multiple sectors has led to drastic changes concerning traditional social practices and how we relate to one another. Moreover, market-driven Big Tech corporations are now entering public domains, and concerns have been raised that they may even influence public agenda and research. Therefore, this chapter focusses on assessing and evaluating what kind of business model is desirable to incentivise the AI for Social Good (AI4SG) factors. In particular, the chapter explores the implications of this discourse for SDG #17 (global partnership) and how this goal may encourage Big Tech corporations to strengthen multi-stakeholder partnerships that promote effective public-private and civil society partnerships and the meaningful co-presence of non-market and market values. In doing so, the chapter proposes an analysis of the sociological notion of 'social license to operate' (SLO) elaborated in the mining and extractive industry literature and introduces it into the discourse on sustainable digital business models and responsible management of risks in the digital age. This serves to explore how such a social license can be adopted as a practice by digital business models to foster trust, collaboration and coordination among different actors – including AI researchers and initiatives, institutions and civil society at large – for the support of SDGs interrelated targets and goals.

Keywords Big Tech corporations · AI4SDG · Social license · Public-private partnerships · Sustainability

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1 Introduction

Artificial intelligence (AI) systems have and continue to entrench themselves into the ever complex sociotechnical infrastructures that characterise our modern digital world. These systems drive many of our everyday tools like vehicles, smartphones, entertainment systems, financial instruments, education practices, retail and healthcare. However, the often opaque, complex nature of the techniques underlying these systems makes their behaviours challenging to track and trace and, thus, hard to predict. With this uncertainty comes new and challenging ethical issues that we must confront head-on, given the ubiquity, pervasiveness and impact that these systems have and will have on our lives and societies.

We already see the consequences of many of these seemingly common, albeit impactful AI-driven technologies on how we relate to each other and our traditional social practices. Much of this, aside from the difficulty of managing the challenges of the underlying AI technologies themselves, is that such AI techniques are often not constrained to a single domain of application but instead come in the form of commercially available (and thus easily accessible) household technologies. Technologies like Amazon Alexa can and are easily upskilled to include novel capabilities and services not native to the device. Consequently, the Big Tech corporations behind this AI upskilling of more basic systems become entangled with public domains such as public healthcare services and many others.

This enmeshment of private corporate bodies with traditional public domains is cause for concern, given the undue influence that these economic giants can have not only on public research and agendas but also on the everyday interactions that private citizens have concerning those public spheres. In response to this challenge, this chapter focuses on assessing and evaluating what kind of business model is desirable to incentivise the AI for Social Good (AI4SG) factors in order to better manage this merging of domains. The AI4SG factors proposed by Floridi et al. (2020) provide a robust normative basis for how designers *should* approach the design and deployment of AI systems towards supporting social good. Likewise, there is a growing body of research on how these AI4SG norms can be used to support higher-order values like the United Nations Sustainable Development Goals (UN SDGs). In particular, the chapter explores the implications of this discourse for SDG #17 (global partnership) and how this goal may encourage Big Tech corporations to strengthen multi-stakeholder partnerships that promote effective public-private and civil society partnerships and the meaningful co-presence of non-market and market values. To do this, the chapter proposes an analysis of the 'social license to operate' – a notion firstly originated from the extractive and mining industry – and introduces it into the discourse on sustainable digital business models and responsible management of risks in the digital age. Adopting these frameworks serves to explore how such a social license can be adopted as a practice by digital business models to foster trust, collaboration and coordination among different actors, including AI researchers and initiatives, institutions and civil society at large to support the SDGs interrelated targets and goals.

2 UNs SDGs Framework and Its Link with AI Challenges and Impacts

2.1 The When and Why of the UN SDGs

In 2015, the United Nations and all member states adopted the 2030 agenda for sustainable development. This 2030 agenda proposed objectives to design and implement a worldwide safe and sustainable future (United Nations 2015). At its foundation are 17 Sustainable Development Goals (SDGs). The adopted proposal recognises that the SDGs co-constitute and co-vary with one another. As a result, despite their numerical designations, they are not mutually exclusive of one another, rank-ordered or framed as trade-offs. For example, SDGs such as the ending of poverty (SDG #1) and climate change remediation (SDG #13) go hand in hand (Schwan 2019). Among ending poverty and climate change action, there are goals such as 'affordable and clean energy' (SDG #7), 'industry, innovation and infrastructure' (SDG #9) and 'sustainable cities and communities' (SDG #11) just to name a few (Fig. 1).

This means that to achieve the stated goals of the 2030 proposal, an integrated and comprehensive understanding of the goals is necessary. Reading the goals, then, as being separate or as rank-ordered is not the correct approach. Instead, they are best read as being mutually co-constitutive of one another. Furthermore, a more general understanding of global system's thinking and complexity sciences is critical to understanding the various effects of different artefacts and subsystems within a more extensive interactive network, rather than the isolation of discrete entities (Ballew et al. 2019; Briscoe 2015; van de Poel 2020). The resulting complexity of

Fig. 1 United nations sustainable development goals. (Source: Schwan 2019)

the covariance and interaction of entities, whether they are humans, rainforests, institutions or technologies, means that equal if not greater interdisciplinarity from numerous fields is required to comprehend and anticipate the effects of different nodes within a more extensive sociotechnical system (Murphy et al. 2015).

These systemic effects did not go unignored by the General Assembly. As a result, the UN established the *Technology Facilitation Mechanism* (TFM) to promote innovative solutions for the SDG agenda, viz. multi-stakeholder collaboration (United Nations 2015). The TFM council meets before every high-level UN meeting on the SDGs to discuss innovative solutions to achieve those goals. Thus, the UN has an institutional orientation towards technology as both the problem and potential solution to global issues. In doing so, the UN explicitly adopted an interactive stance towards understanding the impacts of technology is significant. This means that instead of viewing technology as purely deterministic or instrumental, it affirms the interactional nature of technology and social factors at an institutional level, permitting a landscape of comprehensive expertise to address these problems en masse, rather than haphazardly.

Therefore, we can understand SDGs as partially emerging due to technological development and the potential avenues for amelioration in addressing them. This, of course, does not necessarily entail that every problem requires a high-tech solution (nor that such a solution exists) but that institutional or even conceptual solutions exist to high-tech problems. For example, algorithmic trading agents make rapid stock market trades relatively easy given the efficiency of trading speeds and data analytics to increase the probability that profitable trades are made. However, the economic impacts of such AI systems can be potentially egregious given their relative inaccessibility to all but those organisations that can afford the expensive algorithms. This can easily lead to an excessively unfair marketplace. The solution to such a problem need not be high-tech but can come about through equitable regulations in institutions limiting the times and quantities of trades to promote a fairer marketspace for smaller organisations. Analysing these complex solutions by tackling their interdependencies makes for more robust and more productive solutions.

Thus, artificial intelligence, being part of a larger milieu of ICTs and disruptive technologies, can be understood as ways of realising the goals of SDGs in a similarly holistic way, leveraging the power of big data analytics and machine learning technologies all framed within a design perspective to direct its development towards socially beneficial ends in the service of SDG attainment and human rights. A salient example would be using AI systems to develop Operator 4.0 technologies used in intelligent production manufacturing domains. Such systems support operators by extending their cognitive, sensorial, physical and interactional capacities to increase production efficiency as well as aptly diagnose and design technological development towards beneficial ends (Gazzaneo et al. 2020; Longo et al. 2017; Vernim et al. 2022). Doing so not only increases productivity and thus the potential availability/accessibility of goods such as energy production devices and medical instruments but also provides a safer working environment for operators. The more extensive network of indirect stakeholders is similarly implicated, such as the geopolitical entities that host such production firms and the general public that depend on such technologies. Multiple SDGs are thus involved in such as ‘affordable and clean energy’ (#7) and ‘industry, innovation and infrastructure’ (#9).

These goals similarly inspire the development of new technologies. For example, goal #5 of the UN's agenda aims at gender equality and reducing global physical and sexual violence against women and girls. Towards this end, the peace advocacy group Amnesty International developed and launched the 'Panic Button' app in 2014, permitting users to leverage their networks to report attacks, kidnappings or torture (Amnesty International 2014). The panic button on their phone allows individuals who may face such dangers to have a powerful way of signalling abuse, exemplifying technology's ability to be designed to 'fight' for human rights and gender equality.

Another salient example of how the issues driving the SDGs inspire novel technology is AI in agriculture. Crop disease has been a leading source of global hunger (goal #1) and poverty (goal #2) (Quinn et al. 2011). Given the continual increase in the need for sustainable food production, accessible AI solutions to aid individual farmers, particularly in developing countries, are required to assist in managing factors such as predictions for crop yield (You et al. 2017), growing conditions (Kersting et al. 2012), price forecasting (Ma et al. 2019) and crop choice recommendation (Von Lücken and Brunelli 2008) among others. To this end, the Artificial Intelligence & Data Science Lab at Makerere University in Uganda developed and released the mCrops app diagnostic tools for diagnosing viral crop diseases in cassava crops, one of the important staple food crops in the country and highly susceptible to viral disease (Quinn et al. 2011).

This section aimed to outline the UN's SDG their covariance with technologies, that is, how technologies can be understood as both the causes of the SDGs and potential solutions. Similarly, how the SDG inspires new technologies is briefly explored as well as some examples. The following section outlines the seven AI4SG factors.

2.2 AI for Social Good

In response to the continually growing number of guidelines, frameworks and lists of principles and practices towards socially beneficial AI systems, Floridi et al. developed a set of seven distilled norms to guide designers towards the best practices for designing AI for Social Good (AI4SG) [see Table 1].

Similarly, given the number of definitions of AI, many of which often describe systems that are not strictly AI, we adopt the definition of AI adopted by the latest *Artificial Intelligence Act*, since it suggests a single-future proof definition of AI:

> 'Artificial intelligence system' (AI system) means software that is developed with one or more of the techniques and approaches listed in Annex I and can, for a given set of human-defined objectives, generate outputs such as content, predictions, recommendations, or decisions influencing the environments they interact with (European Commission 2021).[1]

[1] AIA 2021, 39; cf. Annexe 1 on Artificial Intelligence Techniques and Approaches: (a) Machine learning approaches, including supervised, unsupervised and reinforcement learning, using a wide variety of methods including deep learning; (b) logic- and knowledge-based approaches, including knowledge representation, inductive (logic) programming, knowledge bases, inference and deductive engines, (symbolic) reasoning and expert systems; (c) statistical approaches, Bayesian estimation, search and optimisation methods; see European Commission 2021.

Table 1 AI for social good factors and norms

AI4SG factor	AI4SG factor norm
1. *Falsifiability and incremental deployment*	AI4SG designers should identify falsifiable requirements and test them in incremental steps from the lab to the 'outside world' (Floridi et al. 2020, p. 7)
2. *Safeguards against the manipulation of predictors*	AI4SG designers should adopt safeguards that (i) ensure that non-causal indicators do not inappropriately skew interventions and (ii) limit, when appropriate, knowledge of how inputs affect outputs from AI4SG systems to prevent manipulation (Floridi et al. 2020, p. 8)
3. *Receiver-contextualised intervention*	AI4SG designers should build decision-making systems in consultation with users interacting with and impacted by these systems; with understanding of users' characteristics, of the methods of coordination and of the purposes and effects of an intervention and with respect for users' right to ignore or modify interventions (Floridi et al. 2020, p. 9)
4. *Receiver-contextualised explanation and transparent purposes*	AI4SG designers should choose a level of abstraction for AI explanation that fulfils the desired explanatory purpose and is appropriate to the system and the receivers and then deploy arguments that are rationally and suitably persuasive for the receivers to deliver the explanation and ensure that the goal (the system's purpose) for which an AI4SG system is developed and deployed is knowable to receivers of its outputs by default (Floridi et al. 2020, p. 14)
5. *Privacy protection and data subject consent*	AI4SG designers should respect the threshold of consent established for the processing of datasets of personal data (Floridi et al. 2020, p. 16)
6. *Situational fairness*	AI4SG designers should remove from relevant datasets variables and proxies that are irrelevant to an outcome, except when their inclusion supports inclusivity, safety or other ethical imperatives (Floridi et al. 2020, p. 18)
7. *Human-friendly semanticisation*	AI4SG designers should not hinder the ability for people to semanticise (i.e. to give meaning to and make sense of) something (Floridi et al. 2020, p. 19)

Reproduced from Capasso and Umbrello (2021)

Recently, some scholars have used the term AI4SG to describe work on AI aimed at the SDGs and to evaluate AI impacts in terms of direct and direct implications on the seventeen SDGs (Tomašev et al., 2020; Vinuesa et al., 2020; Sætra, 2021a, b; Umbrello and van de Poel, 2021). However, given the global impacts that AI systems can have across multiple domains, their ubiquity as well as their pervasiveness in our sociotechnical infrastructures, it makes sense to ask how AI can be designed to support higher-order values like the SDGs and not only the values often implicated by AI like explicability, privacy and human autonomy (Fig. 2).

The AI for Good Foundation is an excellent example of a non-profit entity coming together in collaboration with academic, institutional and governmental bodies to promote AI not only as the subject of being designed *for* the social good but also as a tool that can be used to *support* the social good in the form of the SDGs. This is also echoed in the work of Umbrello and van de Poel (2021). They argue that a value sensitive design approach towards technology design can be modified sufficiently to address the unique challenges posed by AI systems. As a result, salient

design can draw on the UN's SDGs as a guide for determining values to design *for* (i.e. doing good/beneficial outcomes) as well as avoiding harm using the norms described by the AI4SG norms. An example of how to visualise this can be seen in Table 1.

Naturally, however, the motivations for design differ across different projects. As a result, there is no normative starting point that designers must begin with. The UN's interactional stance maps neatly onto existing design methodologies like value sensitive design, given that VSD is also an approach predicated in the interactional stance. From this point then, technology design can begin with the discrete technology itself as a starting point, the context of use or a specific value. For the sake of explaining how the approach functions, we begin from the left side of the figure – i.e. 'Doing Good' – to illustrate. Engineers can start by determining and explicitly stating which of the SDGs they aim to contribute to, given the type of AI system they are currently engaged to design. In doing so, different SDG resolutions or ameliorations might call for different AI solutions that may be more aptly suited rather than others. Identifying which might be most efficacious towards addressing SDGs can then be used to determine a standard core set of values such as transparency, explicability or data privacy (i.e. the centre of the figure).

Various contextual variables come into play that impact the way values are understood, both in conceptual terms and in practice, on account of different sociocultural and political norms. Eliciting stakeholders in sociocultural contexts becomes imperative within the approach (i.e. working within the bounds to support

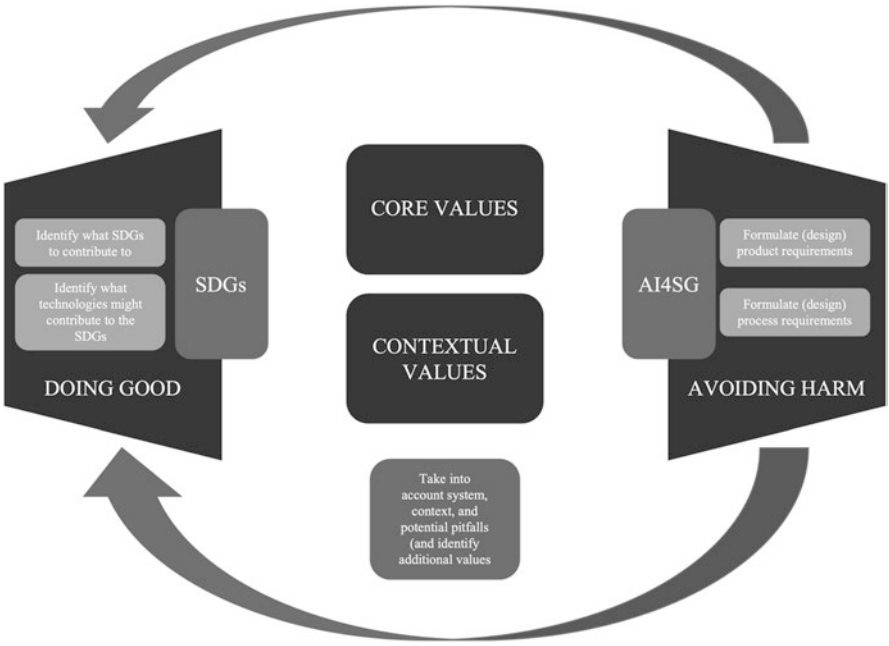

Fig. 2 Doing good and avoiding harm with AI4SG norms

SDG #17) to determine if the a priori explicated values of the project faithfully map onto those of the stakeholders, both direct and indirect stakeholders. In engaging with the context-situated nuances of how various values may come to play with any given system, various pitfalls and constraints can begin to be envisioned, particularly how the initial core values can be understood in terms of technical design requirements. These values can then be used to distil specific technical design requirements by using normative imperatives, in the case of AI, the AI4SG principles.

In sum, AI has already manifested pervasive impacts on a global level. To meet these challenges, the AI4SG norms were developed as a distilled set of design principles to help achieve salient AI design. Still, it makes sense to ask how the AI4SG principles relate to higher-order goals like the SDGs. This section aimed to discuss what the SDGs were and how the SDGs can be supported in tandem with and by the AI4SG norms. Still, this remains relatively novel in terms of its applicability. Given the impacts of AI systems, what is required is greater uptake of an explicit orientation of using the AI4SG principles to support and further the SDGs. The following sections will discuss how to move towards sustainable business models as well as the concept and necessity for a 'social license to operate' concerning AI systems, in particular, the application of this social license to Big Tech corporations, arguably the source of the most impactful and forms of AI that have a global diaspora.

3 Towards Sustainable Digital Business Models: Some Reflections on the Co-presence of Different Spheres and Values

The pervasiveness of AI-empowered technologies across multiple sectors has led to drastic changes concerning traditional social practices and how we relate to one another. These technologies are often not constrained or exclusive to any given domain of application. Instead, they are commercially available and ubiquitous systems often upskilled by providers – typically Big Tech giants – to assimilate new functionalities and practices. 'Big Tech corporations' refer to the four or five largest companies dominant in the information technology sector, including Google, Amazon, Facebook, Apple and Microsoft. These corporations are now entering public spheres such as healthcare. For example, Amazon announced a new partnership with the UK's National Health Service (NHS) that enabled Amazon's digital voice assistant Alexa to offer NHS health advice to users at home (Department of Health and Social Care, 2019). To this end, these Big Tech giants are becoming ever more entangled and diffused within the public sphere. This has been exacerbated by the pandemic and subsequent lockdowns, making private individuals more dependent on home technologies that can provide these health services during a public health crisis (Vargo et al. 2020).

Technology ethicists have raised a growing concern on the predominant impact of private and market-driven corporations on shaping public agendas and research (Sharon 2016, 2021). However, this trend is not new: a piece of worrisome information and power asymmetry related to the introduction of AI systems and Big Data was already outlined in the *Black Box* metaphor by Frank Pasquale, who argued that the politico-economic advantages of 'informational exclusivity' by private corporations could reinforce inequalities and lack of responsibility and accountability in the whole of society (Pasquale 2015, 193).

In contrast to traditional business models that sell goods and services, Big Tech corporations have now access to large data sets and a vast number of resources, and this makes them critical market makers, entities that do not just provide services but an entire infrastructure (Srnicek 2016; Zysman and Kenney 2018). Indeed, such corporations exercise control on essential services on which many different actors and the whole economic ecosystem depend (Rahman 2018; Rahman and Thelen 2019). Moreover, scholars have sustained that in this way, Big Tech corporations may have not only substantial economic and market power but also a political 'platform power' that stems directly from their consumers and users, who intimately appreciate and rely on those corporations and tend to provide opposition to governmental regulations that treat such corporations' convenience and innovation (Culpepper and Thelen 2019).

Thus, to sharpen our understanding of Big Tech corporations' power and new emerging technologies, we need a framework that allows us to explore the role of direct and indirect stakeholders concerning corporations and government, as well as means and modalities to integrate private power and public governance into a policy discussion. The influencing of public opinion and domains by digital business powers may have substantial political and social implications. Therefore, it is vital to open a serious discussion on what kind of business model(s) is desirable to incentivise the AI for Social Good (AI4SG) factors in the digital world. UNs SDGs framework can provide a valuable framework for assessing the impacts of AI, understood not as a neutral tool but as part of a more extensive sociotechnical system: an entanglement of technical, social and institutional dimensions, where also economic and political interests are at stake (Sætra 2021b). Politics should not be eliminated from the three dimensions of sustainability – economic, social and environmental (UN 2015) – but should innervate them from within.

As already noted, several recent studies have already hinted at the potential implications of developing and using AI for social good. For example, within the debate on SDGs concerning the economy, scholars have claimed that AI can significantly impact SDGs #8 (decent work and economic growth), #9 (industry, innovation and infrastructure) and #10 (reduced inequalities) (Vinuesa and et al. 2020). However, other approaches focus instead on business models and the role of AI from the perspective of SDG #12 (responsible consumption and production) (e.g. Di Vaio 2020), looking at how AI may integrate social and environmental needs into current and future trends of sustainable business models.

Thus, there is extensive literature that assesses and evaluates the new role of work and industry due to the introduction of AI. Still, little has been said about AI's

possible long-term positive effects on the economy and as an enabler for social and economic-related SDG targets and indicators, especially those concerning collaborations between different actors, including business models and non-market-driven realities.

For example, Vinuesa and colleagues did not find much published empirical evidence of AI as an enabler or inhibitor of SDG #17 (global partnership for sustainable development) and its various targets.[2] Nonetheless, they sustain that several initiatives that focus on the humanistic side of AI can be a means to achieve effective public-private and civil society partnerships and policy coherence for sustainable development (Vinuesa et al. 2020, supplementary data 1).[3] They also recognised that AI-driven systems are not so easily subject to the oversight or accountability of public experts. However, such systems are massively entering and influencing core social domains, such as healthcare, criminal justice, education and so on (Vinuesa et al. 2020, supplementary data 1; Reisman and al. 2018). Sætra asserted that SDG #17 is part of a group of goals on which AI have minor or no direct effects and limited indirect effects; nonetheless, he recognises that 'AI play a key role as the *subject matter* both for regulations and policy for the partnership for sustainable development' (Sætra 2021b, 15, *italics* by authors).

Among the initiatives that monitor AI4SG's advancements, the Oxford Initiative on AIxSDG is a curated database of AI projects addressing SDGs launched in 2019 (Cowls et al. 2021). Presently, in its online repository, four projects can be found that promote the 'partnership for the goals' SDG; however, those 'partnerships' are related either to specialised communities, such as those of the astronomers and hospital staff or national policies and governments.[4] However, SDG #17 should also aim at promoting global partnership and cooperation built upon shared values and principles. In particular, concerning technology, SDG #17 established in target 17.6 the Technology Facilitation Mechanism (TFM), as already mentioned. TFM intended to be a multi-stakeholder mechanism including UN agencies, governments and various stakeholders to deliver science, technology and innovation (STI) for the SDGs (UN 2015, para. 123). Unfortunately, as highlighted in the Spotlight Global Civil Society Report on the 2030 Agenda and SDGs, TFM is still lacking an online platform due to the absence of dedicated funding and has an 'untapped potential', since it should not be a forum only for proponents of technology but include the direct participation of people that are affected by it (Daño 2019, 188). In a few

[2] Vinuesa et al. (2020) found evidence of positive AI contributions on 15% of SDG 17's subgoals and negative contributions to 5% of its subgoals.

[3] Specifically, Vinuesa et al. (2020) referred to Open AI (project description: https://openai.com/); partnership for AI (project description: https://www.partnershiponai.org/); AINow (project description: https://ainowinstitute.org/); AI Sustainability Centre in Stockholm (project description: http://www.aisustainability.org/). They also provided reference to Smith & Neupane (2018) and Greene et al. (2019).

[4] Oxford Initiative on AIxSDGs. https://www.sbs.ox.ac.uk/research/centres-and-initiatives/oxford-initiative-aisdgs. On the projects related to the promotion of SDG 17, see https://www.aiforsdgs.org/all-projects?sustainable_development%5B%5D=1356&search=d (Last access 4 October 2021).

words, we can say that more 'societal deliberations'[5] on how sociotechnical systems are now impacting norms and SDGs and on how this process should be regulated are still needed and still have vague implementation.

Collective responsibility for sustainability, especially in the digital era of Big Tech corporations, cannot underestimate the role that private-public partnerships (PPPs) and multi-stakeholder initiatives as mechanisms may have in fostering social responses to emerging technology changes and also in redistributing power and resources in more equal modalities, both nationally and globally. Moreover, when such PPPs and initiatives are placed in a proper and democratic regulatory-institutional environment, they can provide better infrastructures to citizens and improve interrelated capacities between different groups, which should be considered integral parts of a whole.

However, the mechanisms and conceptual frameworks for benchmarking such PPPs and multi-stakeholder engagement are mostly vacuous or altogether side-lined in these discussions. This paper proposes the concept of a 'social license to operate' to better frame how multiple stakeholders come to trust and, consequently, accept an industry's legitimate position to operate in their community. The following section defines this social license to operate as well as why it is required in the digital age.

4 The Need for a 'Social License to Operate' in the Digital Age

The notion of a 'social license to operate' (SLO) is not new: indeed, it has increasingly taken a fundamental role in the business literature on sustainability over the years. It was coined concerning the mining and extractive industry but is now used in a range of other industry sectors, and it is generally defined as the acceptance and trust gained by a business model or corporation by the community in which it is placed and operates (Moffat and et al. 2015; Komnitsas 2020). Having a social license to operate means having legitimacy from internal stakeholders and outside stakeholders, and the greater community. Most importantly, it means identifying a business model as a proper social institution: beyond economic and market considerations, every business model is a social entity and thus subject to public accountability and public control (Sale 2019; Melé and Armengou 2015). Social license means also going beyond laws and regulations positioned within the legal system since it is related to credibility and social permission practices. As such, the concept of a social license is based on building and structuring trust and consent of people and communities affected by the business model's actions at stake.

Social license theorists do not align on understanding and measuring the value of social license (Gehman and et al. 2017). Nonetheless, the term's popularity is a sign

[5] Such a term is used also by Daño (2019), 188.

of a general trend towards stakeholder involvement and democratic procedures in the industry literature. One of the most used presentations of social license is the one elaborated by Boutilier and Thomson in the so-called multi-level pyramid model (Boutilier and Thomson 2011). In this model, theorists distinguish between three levels: legitimacy, credibility and trust. SLO includes these three normative components: legitimacy as conformity to norms, credibility as the power to elicit belief and trust as the willingness to be vulnerable to risk or loss on the part of other actors (Thomson and Joyce 2008). Legitimacy is a necessary component of acceptance by stakeholder networks,[6] while credibility means that those networks also approve a business model with formal negotiations or agreements on roles and responsibilities. Finally, trust implies a sense of co-ownership or identification between stakeholders, community and business models through the means of collaborations or shared experiences (Gehman and et al. 2017; Boutilier and Thomson 2011; Thompson and Boutilier 2011) (Fig. 3).

Even if explored concerning well-established corporate frameworks, a discourse on the social license to operate can be extended beyond those sectors for measuring its adaptability and feasibility in the context of new forms of corporations. Thus, for example, introducing sociological considerations into the business literature of sustainability can constitute an asset in the current approaches to AI4SG since these considerations can place an explanatory emphasis on possible trustworthy behaviours by the part of private Big Techs that have an extensive public impact and should account for it.

Until now, few scholars have been concerned with a social license in relation to new digital business models and innovation. For example, some have individuated in social license a possible constraint on regulatory arbitrage, i.e. taking advantage

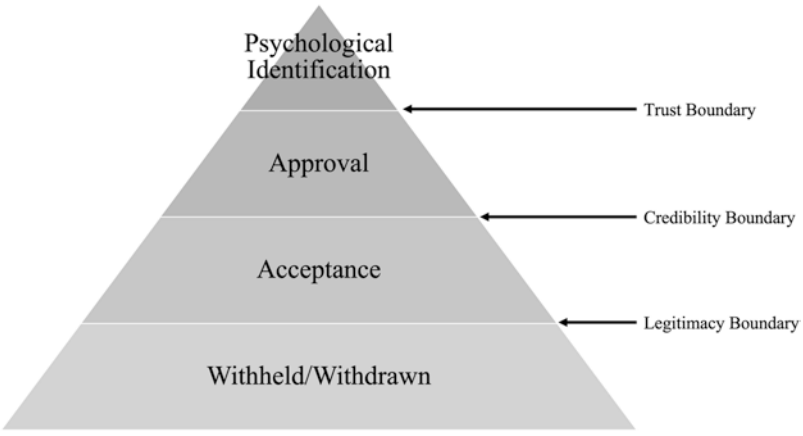

Fig. 3 The pyramid model of SLO. (Reproduced from Boutilier and Thomson 2011: 2)

[6] Boutilier and Thomson speak of 'stakeholder networks' to include many actors that are affected or affect business models beyond and above specific and local communities, such as international human rights activists and others (Boutilier and Thomson 2011, 2–3).

of gaps in existing regulations, by the part of companies such as Facebook or Uber (Pollman 2019), while others have explored how the failure to account for the inherently public nature of corporate actions of private business models such as Uber – regardless of whether an existing 'legal' license exists – can result in the loss of 'social' license (Sale 2019). Finally, others have highlighted the need to earn a social license for big data initiatives during the pandemic (Shaw and et al. 2020) or have specifically introduced the issue of SLO in the governance and responsible management of the risk of digital corporations, but without providing straightforward suggestions on how to implement in concrete terms SLO in Big Techs' proactive strategic business models (Verbin 2020, Chap. 8).[7]

Along those lines, this chapter argues that it is of pivotal importance to initiate a reflection on new global digital business models through the lens of what kind of social license they need. In particular, the sociological literature on the social license can provide a valuable and concrete contribution to the question of sustainability of Big Tech corporations for several reasons.

First, SLO could be an integral part of a corporate strategy that may assist sociotechnical systems involving AI-driven systems to stay ahead of legal regulation and proactively endorse a collective responsibility for sustainability in the digital era. Indeed, as a form of long-term and self-regulation that implies fair and legitimate procedures, it may contribute to the formation and ongoing evaluation of digital business models' socio-political rights and responsibilities. SLO can assist such digital business models in earning social acceptability, programmatically including novel accounts of transparency and accountability relationships and avoiding episodes of corruption or malpractice into their policies and business strategies.

Second, the predominance of the economy of credibility sustained by SLO can be an effective tool for digital business models to ensure sustainable business growth. Unlike traditional business models that rely on supply and demand mechanisms, Big Tech has its users and consumer groups at their core, as already noted. Therefore, internal forms of control that paid attention to social license would be crucial, with the aim to create bilateral processes of change, through an ongoing dialogue with users' communities and relevant stakeholders; the understanding of users' and consumers' changing expectations; the deployment of regular reporting requirements, mitigation and monitoring programs; and so on.

Indeed, SLO means searching not only for acceptance but also for approval from the community: beyond the participation of shareholders, SLO aims at investing in the community, with corporate social initiatives that support or raise awareness on specific social causes through the mechanisms of employment policies, employee training, marketing or funds and volunteering (see on this Lee and Kotler 2005; Boutlier 2017). Much of this aspect of SLO, in terms of being operationalised, viz. AI4SG norms, can be achieved via full life cycle monitoring of systems, allowing

[7] See also Joseph, L.2018 Why the tech giants of Silicon Valley must rebuild trust after explosive beginnings available at https://www.weforum.org/agenda/2018/11/why-move-fast-and-break-things-doesn-t-cut-it-anymore/ (last access October 4, 2021).

designers and stakeholders to continually monitor system inputs/outputs and restrict use and redesign if necessary (c.f., Umbrello and van de Poel, 2021).

Finally, SLO may serve as a powerful practise in the public-private dialectic. The risky decisions of a Big Tech may extend well beyond it and reach the general public, and, as scholars already point out, AI effects can be analysed not only in terms of micro and meso but also in terms of macro levels (Sætra 2021a, b). Following SLO operationalisation, social legitimacy and credibility that should be granted to Big Tech for regulating and delivering essential services related to common goods such as health, security and many others need to be also accompanied by a more enduring value: trust. Trust is a matter of value alignment and of establishing principles and norms on which collectively rely on. Social license is often connected to the theories of the social contract (Demuijnck and Fasterling 2016).

If we want to translate this discourse in the digital realm, it sheds light on the fact that we are embedded in a network of mutual relationships between multiple parties. Those parties have different levels of powers and values but should be equitably enabled to flourish and be responsible for their actions. The literature on SLO critically engages with the issue of how to balance power relations, with the involvement of a multiplicity of cross-sectoral authorities and agencies, including business models, state or regional governments, international expert agencies, NGOs and many others (Meesters and Behagel 2017). Proposing co-evolution and co-regulation mechanisms and tools constitutes a first step in developing an enduring relationship of trust between those parties.

For example, among those mechanisms and tools, we can insert reports on commitments produced by business models that can be monitored and overseen by NGOs or other third-party actors (Morrison 2014; Blair et al. 2008); collaboration between business models and external stakeholders, such as policymakers or civil society organisation, to address cultural and social issues or human rights violations; and cooperation with external stakeholders, such as experts or governments, to engage or communicate with the public more effectively and transparently or to manage environmental, social, governance risks and so on. If 'institutionalised trust' lacks – which in SLO theories implies that the interactional relationships between business models and stakeholders' institutions are based on an 'enduring regard' for each other's interests (Boutilier and Thomson 2011, 4) – psychological identification is understood as a status of well-established trust is unlikely.

Losing LSO is a socio-political risk. Big Tech corporations have already been investigated for violations of trust: from breaching competition and monopoly laws and abusing their dominance in the online market[8] to the breach of users' privacy rights, as demonstrated in the case of the Cambridge Analytica Scandal (Isaak and Hanna 2018). Moreover, a kind of 'regulatory inertia' in recent years has placed Big

[8] See, for example, Schulze 2019. If you want to know what a US tech crackdown may look like, check out what Europe did, June 7, 2019, available at https://www.cnbc.com/2019/06/07/how-google-facebook-amazon-and-apple-faced-eu-tech-antitrust-rules.html (last access October 4, 2021).

Techs in a position to operate without the need to ensure compliance to international principles or considerations of sustainable development (Truby 2020).

However, beyond possible legal, regulatory intervention, it would undoubtedly be significantly beneficial to ensure trustworthiness and public scrutiny on the decisions and actions of Big Techs' new digital business model, especially in modalities that make the latter understand their responsibility towards society. The 'social license to operate' can be adopted as a practice to foster global collaboration and coordination among different spheres: private business models, AI researchers, AI-based initiatives focusing on SDGs, institutions, legislators, policymakers and civil society at large. If further implemented and developed, its theoretical framework can represent a more comprehensive approach to the sustainability of new digital business models, paving the way for being synthesised in a practical methodology that assists AI projects, initiatives and sociotechnical systems in their support of SDGs.

5 Conclusion

The AI for Social Good norms are a growing set of design imperatives that aim at designing AI towards the social good. However, despite many projects exploring how these norms can be operationalised towards achieving higher-order values like those of the UN Sustainable Development Goals, they include little guidance for how their uptake can be increased by the existing business models of Big Tech corporations. The tech giants are arguably the most impactful market players when it comes to the digital age. However, they operate seemingly autonomously despite the impacts they have on multiple stakeholders.

This chapter looks at the types of business models that have a greater propensity to operationalise and forward the AI4SG norms towards supporting global goals like those of the UN SDGs. In doing so, we introduced the concept of the 'social license to operate' (SLO). This sociological notion has its origin in the literature on the extractive and mining industry, but that has now become increasingly used in the sustainability literature across several different industries. We argued that SLO can better capture the criteria necessary for multiple and diverse stakeholders to collaborate and, mainly, to trust industry giants and therefore accept their operation in their communities. Indeed, we demonstrated that SLO can be a practice that, relying on and further developing normative criteria such as legitimacy, credibility and trust, would undoubtedly be significantly beneficial to ensure trustworthiness and public scrutiny on the decisions and actions of new digital business models. Overall, SLO could be a powerful social tool to induce such digital business models the adoption of responsible, sustainable and proactive business strategies.

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