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Difficulties in regulating disruptive technologies: a Habermasian analysis of regulators' worldview and the participation and perceptions of academic fields

Dificuldades em regular tecnologias disruptivas: uma análise Habermasiana da visão-de-mundo dos reguladores e a participação e percepções de campos acadêmicos

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To Gabriel and Regina

Baby, I'm a man, maybe I'm a lonely man
Who's in the middle of something
That he doesn't really understand
Baby, I'm a man, maybe you're the only woman
Who could ever help me
Baby, won't you help me to understand?

Maybe I'm amazed at the way you're with me all the time
And maybe I'm afraid of the way I leave you
Maybe I'm amazed at the way you help me sing my song
Right me when I'm wrong
And maybe I'm amazed at the way I really need you
(Paul McCartney)

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RESUMO

A pesquisa estuda o problema de regulação de Tecnologias e Informação e Comunicação (TIC) disruptivas. O objetivo é descobrir as dificuldades dos reguladores, como eles tentam superá-las, e se contam com a contribuição da Academia. É uma pesquisa empírica, sequencial com métodos mistos.

A justificativa para a escolha do tema decorreu da preocupação crescente da sociedade, expressa na grande mídia, na academia, nos governos e nos relatórios de organismos multilaterais. Preocupação que é alimentada pela velocidade de evolução, pela pervasividade, pela disrupção das fronteiras geográficas, e pela escala dos impactos sociais das TICs emergentes. A decisão de conduzir um estudo empírico focado nos reguladores deveu-se à lacuna identificada na revisão de literatura.

O primeiro passo foi identificar as dificuldades de regulação das TIC emergentes na literatura, o que também determinou a escolha da Teoria da Ação Comunicativa de Habermas como pano de fundo para o estudo. As dificuldades foram classificadas em seis grupos: objetivos sociais, questões do ambiente, questões técnicas, questões jurídicas, comportamento ou traço individual e direcionadores.

A segunda etapa começou com uma análise exploratória qualitativa em documentos produzidos por Comissões de Ciência e Tecnologia das casas legislativas nos três níveis de governo brasileiro (Federal, Estado de São Paulo e Município de São Paulo). Em seguida, foi entrevistada uma amostra de políticos e burocratas especializados do poder executivo e do Ministério Público que participaram das discussões nas audiências públicas em 2019 e são a principal fonte de dados para uma análise qualitativa aprofundada. Para tanto, foi usado o Multiple Streams Framework para ajudar a avaliar a estrutura idealizada de Habermas no cenário político.

Foram descritos os grupos de atores presentes nas discussões e analisados o desempenho e as dificuldades das Comissões nos três níveis de Administração. O cenário multissetorial e multidisciplinar e as dificuldades de restrição de tempo ganharam novas dimensões devido às tecnologias disruptivas. Retratamos o processo preferido de regulação das TIC, mostrando os pontos estratégicos de atuação dos grupos de interesse para influenciar propostas de leis e regulamentações infralegais e a importância dos atores críticos.

A última etapa da pesquisa foi um questionário com quatro grandes áreas da academia (Administração, Sistemas de Informação, Direito e Sociologia) para descrever a experiência com o processo de regulação das TIC emergentes e as diferenças na percepção das dificuldades, valores, necessidades e preocupações levantados nas etapas anteriores, por meio de Análise Discriminante Múltipla.

Em geral, houve baixa participação e contribuição prática. Os respondentes reconheceram as dificuldades na regulação das TIC e poucas variáveis mostraram diferenças entre as áreas, algumas das quais inesperadas.

Os resultados ampliam a classificação existente de desafios para regular tecnologias disruptivas, servindo como possíveis níveis de análise. A análise crítica das dificuldades identificadas nas falas dos entrevistados foram separadas entre aquelas comumente observadas no ambiente político e aquelas próprias das discussões sobre as TIC emergentes. Além disso, a pesquisa contribui ao descrever objetivamente as diferenças que desafiam a multidisciplinaridade necessária para regular as TIC.

Também fornece recomendações práticas para revisão de literatura sobre temas que cruzam fronteiras com o campo do direito e descreve o processo de regulação de TIC preferido, destacando os pontos estratégicos de ação e os atores críticos que os grupos de interesse podem atingir.

Palavras-chave: Tecnologias disruptivas, Regulação, Reguladores, Multidisciplinar, Habermas, Multiple Streams Framework, Entrevista Elite, Análise Discriminante

ABSTRACT

The research studies the problem of regulation of disruptive technologies and Information and Communication (ICT). The objective is to discover regulators' difficulties, how they try to overcome them, and whether they count on the contribution of the Academy. It is empirical, sequential, and mixed-method research. The justification for choosing the theme stemmed from the growing concern of society, expressed in the mainstream media, academia, governments, and reports from multilateral organizations. The speed of evolution, the pervasiveness, the disruption of geographical boundaries, and the scale of social impacts of emergent ICT fuel the concern. The decision to conduct an empirical study focused on regulators was due to the gap identified in the literature review. The first step was identifying the difficulties of regulating emerging ICT in the literature, which also determined the choice of Habermas' Theory of Communicative Action as background for the study. We classified the difficulties into six groups: Societal objectives, Environment issues, Technical issues, Legal issues, Individual behavior or trace, and Drivers. The second step started with a qualitative exploratory analysis of documents produced by Science and Technology Committees from the legislative houses in the three levels of the Brazilian government (Federal, São Paulo State, and São Paulo city). Then, a sample of politicians and specialized bureaucrats from the executive branch and public prosecution service who participated in the discussions in public hearings in 2019 was interviewed and are the primary source of data for an in-depth qualitative analysis. For this purpose, we used the Multiple Streams Framework to help assess Habermas' idealized framework in the political scenario. We described the groups of actors present in the discussions and analyzed the performance and difficulties of the Committees at the three levels of Administration. The multistakeholder and multidisciplinary scenario and the time constraints difficulties gained new dimensions due to disruptive technologies. The last step of the research was a survey with four grand f academic fields (Administration, Information Systems, Law, and Sociology) to describe the experience with the regulation process of emerging ICT and differences in the perception of the difficulties, values, needs, and concerns raised in the previous stages through a Multiple Discriminant Analysis. In general, there was low participation and practical contribution. Respondents recognized the difficulties in regulating ICT, and a few variables showed differences between areas, some of which were unexpected. The results expand the existing classification of challenges to regulate

disruptive technologies, serving as a possible level of analysis. We separated the critical analysis of the difficulties identified in the interviewees' speeches into those commonly observed in the political environment and those proper to the discussions about emerging ICT. Besides, the research contributes by objectively describing the differences that challenge the multidisciplinary necessary to regulate ICT. It also provides practical recommendations for a literature review on themes that cross boundaries with the law field and describes the preferred ICT regulation process, highlighting the strategic points of action and critical actors that interest groups can target.

Keywords: Disruptive technologies, Regulation, Regulators, Multidisciplinary, Habermas, Multiple Streams Framework, Elite Interview, Discriminant Analysis

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1 INTRODUCTION

The problem of regulating new technologies is not new. Just remember cars. Drivers emerged as new actors whose coexistence with pedestrians and traditional animal transport had to be regulated. An entire infrastructure of roads, signs, equipment, and conventions had to be created so that the rules could be complied with and supervised, and drivers and pedestrians learned to follow these rules. However, even today, a Brazilian driver or pedestrian who ventures into a country with left-hand traffic will have great difficulty complying with local rules. Traditional animal transport did not resist and disappeared or, as currently said, suffered the disruption of its business model.

Now we are facing autonomous vehicles with a new actor: embedded Artificial Intelligence (AI). It raises the question of whether the existing rules can be maintained and applied or need to adapt to this new reality. Infrastructure and equipment are already being prepared. Just like animal handlers, traditional drivers and their business models will be disrupted, but, before that, along with pedestrians, passengers, and artificial intelligence (AI), they will have to learn the coexistence rules.

Four aspects give a different character to the problem of regulating emergent Information and Communication Technologies (ICT) nowadays: the speed of evolution, the pervasiveness of digital technologies, the disruption of geographic borders in a world connected by the internet via a network of digital platforms, and the scale of the impacts on society. (Eggers & Turley, 2018; Gozman et al., 2019; High-Level Expert Group on Artificial Intelligence, 2019; ILO, 2021; OECD, 2019; OECD, 2020; Palmerini et al., 2014; UNESCO. Information for All Programme (IFAP), 2007; UNESCO, 2019b; World Bank, 2021).

Big data analytics, the internet of things (IoT), cloud computing, quantum computing, autonomous robots, augmented reality, facial recognition, cryptocurrencies, and digital platforms are some other examples of emergent ICTs, also called innovative or disruptive technologies, that attracted the attention of multilateral organizations (e.g., UNESCO. Information for All Programme (IFAP), 2007), government agencies (e.g., Executive Office of the President of the United States of America, 2016), standard-setting organizations (e.g., IEEE, 2019), consulting companies (e.g., Eggers and Turley, 2018), and non-government organizations (NGO) (e.g., Ada Lovelace Institute and AI Now Institute and Open Government, 2021).

Concerns about the impacts on society (e.g., effects on jobs, algorithmic bias, social media disinformation, data privacy) increasingly echo in different arenas where emerging technologies are discussed. It is an everyday discourse among governments, politicians, and bureaucrats. Besides, it is present in scientific forums, media, organized civil society, and business. The uncertainties and risk of adverse outcomes of these new technologies for the Sustainable Development Goals (SDG) give rise to the call for an Omni-stakeholder approach to the public policy process (UNESCO, 2019a). A movement that International Multilateral Organizations positively support and have fuelled the debate and development of ethical principles, mainly concerning Artificial Intelligence (AI) (e.g., High-Level Expert Group on Artificial Intelligence, 2019; IEEE, 2019).

However, the consequences in case of violation are still unclear, feeding the development of management procedures to deal with legal and regulatory risks (Carolina, 2019) or the demand for new regulations, surprisingly, from CEOs of Big Tech companies like Apple, Facebook, or Microsoft (e.g., Bartz and Culliford, 2021). The challenge is how to do it without hindering innovation.

The ICT regulation theme is still immature in the IS field but gaining attention. Calls for papers from some of the basket journals show the path starting from the ethical concern with AI and Analytics for society (Dennehy et al., 2016), passing through the call for responsible research (Davison et al., 2017), the impact to the socio-economic development of digital platforms in developing countries (Davison et al., 2018), the implications of winner-takes-all platform economics, and the social, environmental and economic implications of the blockchain (M. Rossi et al., 2019), the concern with fake news phenomenon on the Internet (Dennis et al., 2019), and with the failure of digital transformation initiatives in Latin American context (Joia et al., 2020). This path led to the calls for research on the ICT regulation theme (Gozman, Butler, & Lyytinen, 2019; Aanestad, Kankanhalli, Maruping, Pang, & Ram, 2021), highlighting the necessary multidisciplinary approach to study the problem destined to assist policymakers in practice. A challenge that is not new to the IS area (Webster & Watson, 2002).

However, our literature review on the difficulties in regulating ICT showed that the challenge of integrating with law scholars is not easy and usual (Mahieu, Eck, Putten, & Hoven, 2018).

The literature is dominated by conceptual works, often without an express theoretical perspective (North-Samardzic, 2019), with a typical nature of the philosophy field that is

descriptive rather than normative (Stahl, Eden, Jirotka, & Coeckelbergh, 2014). Besides, in the landscape of ethical governance (Winfield & Jirotka, 2018), in which ethics (or ethical principles) lead to standards (soft rules), which in turn lead to regulation (hard rules), we found few empirical studies in our literature review, an imbalance in favor of the study of ICT-related ethics, and few studies focusing on regulators (Akhigbe, Amyot, Mylopoulos, & Richards, 2017).

In the ICT regulation process, the various interests with their different bargaining power are brought to the political-technocratic regulatory arenas at a country's local, regional and national levels, depending on the legal distribution of legislative power related to the ICT issue under discussion. Often with an overlap between levels, as is the case in Brazil. Among the actors, academics and practitioners help legislators in different ways, such as through public hearings and consultations on regulatory proposals.

The complex distribution of regulatory power between multiple administration levels for a developing country with a civil law system (i.e., written law) highlights the importance of the lawmaking process, becoming one more competitive hurdle. Besides, what makes the Brazilian context of ICT law-making interesting is the past leadership and the supposedly successful ICT law-making experience (e.g., Freedom of Information Act 2011 and Civil Rights Framework for the Internet Act 2014), its present conjuncture (right-wing wave, economic stagnation, and high unemployment), competition between legislative agendas (e.g., moral, economic, social security, corruption, environment, violence), its structural bottlenecks (e.g., lack of basic infrastructure, poor educational performance) and its cultural traits (distrust of politics, and the “Brazilian way of fixing things” (Ferreira et al., 2012)).

Therefore, the research question we propose for the study is: What are regulators’ difficulties in regulating disruptive technologies?

The main objective of this research is to understand regulators' difficulties in regulating emergent ICT and how they try to overcome them, especially with Academia's contribution.

The specific objectives are: 1) to identify the obstacles or challenges that hinder the regulation of emergent ICTs present in the literature; 2) to identify the actors in the ICT regulation process; 3) to identify the obstacles and challenges in regulating ICT through the perception of protagonists in the process: politicians and specialized bureaucrats from the executive branch involved in legislative or regulatory proposals discussions, and the strategies adopted to overcome them; and 4) describe the differences between four grand academic

areas (Administration, IS, Law, and Sociology) in terms of experience and perceptions about the problem of regulating ICT in Brazil.

In this research, ICT regulation is defined as the rule-making of laws and subordinate rules by all levels of government (OECD 1997), encompassing the concept of the public policy process, which considers the interactions of actors, events, contexts, and outcomes in the process (Weible, 2017).

By difficulties in regulating emergent ICTs, we mean business and technological challenges like the pacing problem, disruptive business models, the blurry of markets and sectors by digitalization, the confusion of the traditional distinction between consumers and producers, the different rules of price formation in the digital economy scaping the standard cost-based regulatory models, the enforcement, the no regard for national or jurisdictional boundaries, or the transversal challenges to the traditional institutional regulatory framework focused on specialized sectors (Eggers & Turley, 2018; OECD, 2019).

This study has a critical research philosophical position based on Habermas' Theory of Communicative Action (TCA) (1984, 1987) and his derived theoretical construction of Discourse ethics (1990) and Discourse theory of law and politics (1996).

Jürgen Habermas appeared in the literature review as one of the theoretical alternatives to study the phenomenon of regulation of ICTs, with the advantage of being used in empirical studies (e.g., Schlagwein, Cecez-Kecmanovic, & Hanckel, 2019; Stahl, Doherty, & Shaw, 2012), which are more scarce (North-Samardzic, 2019). Particularly those that go beyond the archival analysis of documents (Relly & Schwalbe, 2016). Besides, the IS field recognizes Habermas' TCA (e.g., Ngwenyama & Lee, 1997; Klein & Huynh, 2004; Myers & Klein, 2011) as a valuable theoretical lens.

Habermas represents Society in two domains of actions. One strategic, "System", and the other, "Lifeworld", where people cooperate using language based on mutual understanding and shared knowledge of norms, conventions, habits, and accepted world views. In this domain, he contributes with concepts and principles on a deontological basis (e.g., Validity Claims of speech, Ideal Speech Situation). Later, he introduced ethical and moral questions into this framework to achieve a concept of a "Valid Norm" (Habermas, 1995), which he uses in his idealized conception of "Deliberative Democracy" (Habermas, 1996).

Looking for the best alternative to represent TCA's System domain and help to bridge the Human Lifeworld, we searched for the leading frameworks, theories, or models from the

public policy field (Heikkila & Cairney, 2017). We decided to use some of the assumptions (e.g., Ambiguity, Time Constraints, Problematic Policy Preferences) and the “Policy Entrepreneur” and “Agenda Window” concepts from the Multiple Streams Framework (MSF) by John Kingdon (1995).

The next chapter describes the structure of the thesis in the format of three articles and the proposed interconnection between them, their models, and research methods.

2 STRUCTURE AND INTERCONNECTION OF PROPOSED ARTICLES

The option of presenting the thesis in the “3 articles” format followed the rules of the Postgraduate Program in Administration at FEA/USP.

The first article sought to identify the difficulties of regulating emerging ICT in the literature. The second article presented the theoretical background and qualitative analysis based on interviews with the protagonists in the regulation process: politicians and specialized bureaucrats from the executive branch and the public prosecution service. Finally, we conducted a survey with four grand areas of academia to describe the differences and experiences with the regulation process of emerging ICT and the perception of the difficulties, values, needs, and concerns raised in the two previous works.

Table 2.1 presents the Methodological Mooring Matrix (Costa et al., 2019), synthesizing the papers’ justification of distinction and interdependence.

2.1 Systematic Literature Review

Chapter 3 brings the Systematic Literature Review (SLR) to provide an overview of the academic literature about the ICT regulation process, specifically to identify the obstacles or challenges the authors perceive that hinder the regulation of emergent ICT.

We conducted a tool-supported SLR by following Bandara, Furtmueller, Gorbacheva, Miskon, & Beekhuyzen's (2015) guidelines, answering the authors’ call for literature reviews with a detailed description of the overall method and how we used the tools.

The chapter describes the steps taken to overcome the risk of bias due to the absence of law studies and the lack of journals from civil law countries. However, the quality assessment criteria through journals’ impact factor indexes and forward-searching inhibited the inclusion of those from law journals, revealing the limitation to integrating the law field through an SLR.

Notwithstanding the conclusion that an SLR is insufficient to achieve the goal of a broad, representative and qualified review embracing the IS and Law fields without being complemented by articles from legal journals, books, and gray literature, the results were helpful as a scoping review.

Table 2.1 Methodological Mooring Matrix

RESEARCH CENTRAL QUESTION What are regulators' difficulties in regulating disruptive technologies?				
GENERAL OBJECTIVE Understand regulators' difficulties in regulating disruptive technologies and how they try to overcome them, especially with Academia's contribution.				
Study		1	2	3
Distinction Justification	Title of each study	Difficulties to Regulate ICT: Challenges to a multidisciplinary literature review	Regulators' difficulties in regulating ICT: A Habermasian analysis with the help of The Multiple Streams Framework	A Discriminant Analysis of Academic Fields about the ICT Regulation Problem
	Research question	What are the regulator's challenges in regulating ICT?	What are the difficulties in regulating ICT, and how do regulators try to overcome them?	Which are the differences between Academic fields regarding experience and perceptions concerning the ICT regulation problem?
	General and specific objective	In a broad context, provide an overview of the academic literature on the ICT regulation theme. Identify the obstacles or challenges the authors perceive that hinder the regulation of emergent ICT.	Identify the obstacles and challenges in regulating ICT through the perception of protagonists in the process: politicians and specialized bureaucrats from the executive branch involved in legislative or regulatory proposals discussions.	Describe the differences between four grand academic areas (Administration, IS, Law, and Sociology) in terms of experience and perceptions about the problem of regulating ICT in Brazil.
Justification of interdependence	Type and timing	Sequential theoric	Sequential Empiric	Sequential Empiric
	Method	Mono-method	Multi-method exploratory archival analysis and interviews	Mono-method
	Data collection procedure	Systematic Literature Review	Archival analysis of public documents and interviews with politicians and bureaucrats who participated in the Public Hearings.	Survey with professors and researchers from the four grand academic areas.
	Data analysis procedure	Qualitative coding and analysis	Qualitative coding and analysis	Discriminant analysis
Publishing Status		Early versions were submitted to the ECIS2020 (rejected on Feb. 26, 2020), to the Journal of Information Technology (rejected on Mar 28, 2021), to the Government Information Quarterly (rejected on Feb 25, 2022), to the Journal of Public Administration Research and Theory (rejected on Jun 21, 2022), and to the Digital Policy, Regulation and Governance journal (Aug 12, 2022).	Early versions were submitted to the AMCIS 2020 (presented on Aug 10, 2020), to the Journal of Information Technology (rejected on Jun 14, 2021), to a MIS Quarterly special call (rejected on Jul 29, 2022), and resubmitted to MIS Quarterly.on Aug 7, 2022 (rejected on Sep 1, 2022).	-

The main takeaways of the first paper that we used in the research sequence are:

a) the opportunity for empirical studies that go further than the archival analysis of documents;
b) Jürgen Habermas' theoretical framework to study the ICT regulation process;
c) the groups of regulators' difficulties in regulating emerging ICT that we classified as Societal objectives, Environment issues, Technical issues, Legal issues, Individual behavior or trace, and Drivers;
d) within the regulators' difficulties identified, the challenges to the conventional border of national legal systems; the asymmetry of lobbying power over regulators innovated by social media power in shaping voters' preferences and, consequently, politicians'; the overlap of rules; and the challenge of a multistakeholder and multidisciplinary environment are those that spiked more interest for our research; and
e) the unexplored differences in Academic fields of participation, contribution, and the ontological position about the ICT regulation problem.

2.2 Empirical Study (qualitative)

The second article (chapter 4) is an empirical study in which we aim to answer these questions: what are the difficulties in the ICT regulation process, and how do regulators try to overcome them?

This article assumes a philosophical position of critical research for the thesis, based on the Theory of Communicative Action (TCA) by Jünger Habermas (1984, 1987). To bridge the domains "System" and "Lifeworld" of the TCA framework, we used the Multiple Streams Framework (MSF) proposed by John Kingdon (1995). The article briefly introduces the two theories describing the main concepts of interest for the thesis.

The research is a single-case study of the Legislative's political-technocratic environment in Brazil, with embedded units of analysis (Yin, 2018) concerning the three Administration levels (Federal, State, and Municipal), specialized Science and Technology Committees (SC) of legislative houses, the different groups of actors (e.g., legislators, bureaucrat experts, academic or practitioner experts) who participated from the discussions about regulating digital platforms in 2019, and the individuals as the smallest unit of analysis.

The first stage of the qualitative methodology comprised the archival analysis of public records produced by specialized SCs from legislative houses in 2019, mainly video records of the meetings and public hearings. The second stage consisted of interviews with a sample of five Committees members, four specialized bureaucrats who participated form the public hearings, and two legislative assistants.

Following the dramaturgical model Myers & Newman (2007) proposed, the interviews were unstructured, with a photo-diary interview approach (Latham, 2003), and adjusted to videoconferencing platform-mediated due to the Covid-19 pandemic. The findings from the exploratory archival analysis of the meetings served to the negotiations with members' staff (blocking gatekeepers) and to plan each step of the interviews. They were video-recorded, and we encoded and analyzed the transcriptions with NVivo12 software.

The coding strategy mixed different techniques (attribute, provisional, holistic, in Vivo, and descriptive). However, our main target was Value Coding and Versus Coding because they are adequate to lawmaking's conflicting context, the research objectives, and Habermas' critical theory (Saldaña, 2009).

The findings of this article that interconnect with the last article are:

a) the description of the group of actors in the multistakeholder and multidisciplinary regulatory arena;
b) the main themes discussed at each administration level and the actors who had relevant participation, some of them due to Focusing Events;
c) the picture of some of the interviewees' speeches' values, needs, and concerns, associated with the MSF's and Habermas' "Lifeworld" concepts;
d) the critical analysis of the difficulties separating those commonly observed in the political environment from those related to emerging ICT discussions.

2.3 Empirical Study (quantitative)

The third article (chapter 5) focused on the ontological position of different fields of Academia (Social Science, Law, Business & Administration, and Computer Science & Engineering) regarding the ICT regulation problem with a quantitative approach (survey).

We used multiple discriminant analysis (MDA) to investigate group differences in participation and perceptions about the difficulties identified in the literature review and

about critical values, needs, and concerns in the conflict situations identified in the interviews with the protagonist actors of the process.

We applied the same questionnaire to a network of scholars in the grand areas of Law, Computer Science and Engineering, Business and Administration, and Social Science.

The last chapter of the thesis will include the analysis and conclusions considering the articles together to present the overall contribution, limitations, and opportunities for future research.

3 LITERATURE REVIEW

DIFFICULTIES TO REGULATE ICT: CHALLENGES TO A MULTIDISCIPLINARY LITERATURE REVIEW [12345]

Abstract

Society is growing concerned about regulating emerging Information and Communication Technology (ICT), mainly after the EU General Data Protection Regulation. However, the literature on the theme is still immature, focused on the ethical development, use, and social impacts of these disruptive and ubiquitous technologies, most commonly found in non-academic sources like multilateral organizations and government agencies commissioned research. We conducted a broad inter-disciplinary tool-supported Systematic Literature Review (SLR) to identify the obstacles or challenges that hinder the regulation of emergent ICT. We tried to overcome the risk of bias due to the absence of law studies and the different legal systems, but the articles' quality assessment inhibited the inclusion of articles from law journals in our final sample of 41 papers we analyzed using the NVivo12 tool. We found authors' mentions of difficulties in regulating emergent ICT, which we classified into six groups: Societal objectives, Environment issues, Technical issues, Legal issues, Individual behavior or trace, and Drivers. It expands the existing classification and serves as a possible analysis level to address a research agenda. Besides, we contributed to the debate about the proper use of the systematic review method through practical recommendations for searching themes that cross boundaries with the law field, like privacy, authorship, cybersecurity, and autonomous devices.

Keywords: ICT Regulation, Systematic Literature Review, Information Systems, Law, Multidisciplinary

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3.1 Introduction

The Information and Communication Technology (ICT) regulation has aroused a growing academic interest, mainly after the approval of the EU General Data Protection Regulation (GDPR), the recognition of widespread manipulation of social media by governments and political parties (Allcott & Gentzkow, 2017; Bradshaw & Howard, 2019), and more recent concerns about massive facial surveillance programs (Feldstein, 2019). Following this trend, it is common to find the paradoxical situation where the CEOs of Big Tech companies, like Apple, Facebook, or Microsoft, claim more regulation for their business.

The theme follows the pattern of being embedded in the ethics rubric, likewise the theme of privacy (Smith et al., 2011). However, it is also pervasive in various topics like: privacy, cybersecurity, regulatory risk and compliance, AI algorithms accountability, digital trust, blockchain, crowdsourcing, IoT, mobile services, competition and antitrust under new business models, sharing economy, digital ecosystems, social media, challenges to democracy, dark sides of IT, and the like. Additionally to the Information System (IS), these studies are called to embrace a wide range of fields, such as Anthropology, Economics, Law, Public Policy, and Sociology, from a cross-level, multi-referent, and inter-disciplinary perspective (HICSS Conference Office, 2022).

We found a few literature reviews or scientometric studies, but except for Kunyenje and Chigona (2017), who studied external actors' influence during national ICT policymaking, none had ICT regulation as the core of the research purpose. They focused on ethics issues (Mahieu, Eck, Putten, & Hoven, 2018; Mittelstadt & Floridi, 2016; North-Samardzic, 2019, Novitzky et al., 2015), law compliance (Akhigbe, Amyot, & Richards, 2016), visualization in legal documents (Rossi & Palmirani, 2017), IoT adoption and use across government agencies (Chatfield & Reddick, 2019), and information privacy (Smith et al., 2011).

On the other hand, we can easily find the concern with the ICT regulation across reports or working papers from multilateral organizations (e.g., ILO, 2021; OECD, 2020; UNESCO, 2019; Walden and Christou, 2018), standard-setting organizations (e.g., IEEE, 2019), government agency (e.g., High-Level Expert Group on Artificial Intelligence, 2019; Palmerini et al., 2014), private companies (e.g., Eggers and Turley, 2018), and non-government organizations (NGO) (e.g., Ada Lovelace Institute and AI Now Institute and Open Government, 2021; Walsh et al., 2019).

Eggers & Turley (2018) and OECD (2019) classify emerging technologies' challenges to traditional regulation into groups described in Table 3.1.

Table 3.1 Classification of emerging technologies' challenges to traditional regulation

Group/Subgroup[a]	Group[b]
Business challenges	The pacing problem
The pacing problem	Designing “fit-for-purpose” frameworks
Disruptive business models	Enforcement
Technological challenges	Institutional and transboundary
Data, digital privacy, and security	
AI-based challenges	

Source: a) Eggers & Turley (2018), b) OECD (2019)

“The pacing problem”, concerning the fast development of digital technologies imposing new grounds of disconnection with the regulatory pace, is one of the broad categories of OECD's (2019) classification, while Eggers & Turley (2018) embed it in the “Business challenges” group. This group includes “disruptive business models” challenges, which corresponds to OECD's (2019) broad category of “designing ‘fit-for-purpose’ regulatory frameworks”. These groups include critical challenges to rulemaking of emerging ICT like the blurry to the usual delineation of markets and sectors by digitalization, the confusion of the traditional distinction between consumers and producers, or the different rules of price formation in the digital economy scaping the standard cost-based regulatory models. The second group proposed by Eggers & Turley (2018) is “Technological challenges”, encompassing “Data, digital privacy, and security” and “AI-based challenges”. OECD (2019) did not consider a similar category of challenges but proposed two other concerns “The regulatory enforcement challenges” and “The institutional and transboundary challenges”. The latter includes the no regard for national or jurisdictional boundaries, the transversal challenges to the traditional institutional regulatory framework focused on specialized sectors, and the fragmentation of regulatory frameworks across jurisdictions enabling companies to “forum shop” or avoid compliance through placing production across different countries.

Even for a still immature theme like the ICT regulation, an SLR is valuable to confirm the lack of data, stress the limited understanding of the phenomena due to few empirical studies, identify gaps, and suggest future research (Petticrew & Roberts, 2006).

Therefore, inspired by Akhigbe, Amyot, Mylopoulos, & Richards's (2017) claim of a paucity of IS research focusing on regulators, we propose the research question: What are the regulator’s challenges in regulating ICT?

The purpose was to provide an overview of the production of the ICT regulation theme in a broad context, regardless of the technology type, the country's legal system or development level, or the regulatory body's administrative level. The specific purpose was to identify the obstacles or challenges the authors perceive that hinder the regulation of emergent ICT.

By ICT regulation, we mean the rulemaking of “laws, formal and informal orders and subordinate rules issued by all levels of government, and rules issued by non-governmental or self-regulatory bodies to whom governments have delegated regulatory powers” (OECD, 1997). Therefore, it embraces the lawmaking by elected representatives and infra-legal regulation by which rules are administered and enforced by executive offices or specialized agencies.

Otherwise, themes like e-government, e-justice, ICT4D, law compliance or enforcement systems, legal advisor or decision support systems, or legal requirements engineering are out of the SLR scope, as they do not refer to rulemaking or policymaking.

We conducted a tool-supported SLR following Bandara, Furtmueller, Gorbacheva, Miskon, & Beekhuyzen's (2015) guidelines, answering the authors’ call for literature reviews with a detailed description of the overall method and how we used the tools.

We started with a higher-level search strategy through various databases, identifying articles published in journals and conference proceedings from 2009 to July 2019. The challenge was to bring contributions from different fields to an inter-disciplinary mapping of the theme's knowledge. For this purpose, we had to adjust the initial planning of the SLR to deal with the risk of bias due to few contributions in law journals and the imbalance in the different legal systems favorable to common law. After completing all the steps – inclusion, exclusion, and quality assessment –we reached a sample of 41 papers we analyzed using the NVivo12 tool.

The results of the SLR on a set of topics not yet explored by this method expanded the classification of regulatory challenges proposed by OECD (2019) and Eggers & Turley (2018) through the classification of authors’ mentions of challenges to the regulation of emergent ICT into six groups: Societal objectives, Environment issues, Technical issues, Legal issues, Individual behavior or trace, and Drivers. This classification indicates possible levels of analysis and opportunities for future research, such as the risk of paternalism by regulators (Societal objectives group), the multi-layered platform networks of the ICT ecosystem (Technical issues

group), and legal enforcement mechanisms to ensure that companies bide to the self-regulation guidelines (Legal issues group). Another suggestion is that researchers take advantage of the unexpected events that can trigger the regulation process (Drivers) to explore individual aspects of decision-making (Individual behavior or trace) and the complex, multistakeholder and multidisciplinary political environment (Environment issues).

We contributed to the multidisciplinary literature by describing the difficulties of covering multidisciplinary themes like the ICT regulation, which needs to join academic fields with a production culture and quality assessment standards so different, such as IS and Law fields. Despite the steps to minimize the bias, the results shall be taken as the first stage of a mixed-method broad review, in which the uncovered fields need to be complemented by sources qualified according to the area's culture.

The rest of the paper is organized as follows: in the next section, we detail the whole process of literature search, mitigation of bias risk, quality assessment of the sample selected, and the coding strategy. Then, we present the findings starting with the sample's main characteristics, the analysis of the literature reviews articles within the sample, the result of the coding process of regulators' challenges, and a picture of the missed contributions from law journals and the gray literature referenced in the articles. We conclude by discussing the main findings, the challenges, limitations, and practical contributions for those planning to integrate their literature review with the Law field.

3.2 Systematic Literature Review

3.2.1 The original planning

We used StArt software (State of the Art through Systematic Review) (Silva et al., 2013), a literature-specific tool for the development of the first stage pointed out by Bandara et al. (2015): the identification and extraction of a sample of papers for the review. We analyzed the papers´ contents with the help of Mendeley's reference manager tool.

The literature screening started in August 2018, employing some automatic advice services (article alert) from databases, Google Scholar, Mendeley, Research Gate, Researcher app, and newsletters from ACM Tech News, resulting in a preliminary selection of 73 papers, book sections, and reports. Based on this first contact, we defined the keywords for the

literature search: ICT; Information and Communication Technology; Artificial Intelligence; Ethics; Law; Legal; Legislation; Normative; Regulation; Regulatory.

The nature of the study theme embraces multiple domains of interest. In the situation at issue, Bandara et al. (2015, p. 161) recommend searching “at a higher level through various available databases.”

Initially, we selected as sources some of the databases commonly used among IS scholars (Bandara et al., 2015, p. 162): ACM Digital Library, AIS Electronic Library, EBSCOhost, IEEE Xplore Digital Library, ProQuest, SAGE journals, Scielo, ScienceDirect, Scopus, and Web of Science.

We used keywords in English, Portuguese, and Spanish to search the databases. We set the time range for the publication dates from 2009 to July 2019. The search's focus was “primary” articles, specifically on the target topic (Bandara et al., 2015, p. 164), from journals and conference proceedings. Filters to select only peer-reviewed journals were used whenever available in the search engine, as well as the limitation to the languages of interest.

The abstract was the field used for most of the searches, so the strings, for example, the AIS’s one, were: abstract: (ICT OR “Information and Communication Technology” OR “Artificial Intelligence”) AND abstract: (Ethics OR Law OR Legal OR Legislation OR Normative OR Regulation OR Regulatory).

Each search session's results were exported in Bibtex or RIS formats and uploaded to the StArt project file. Whenever the number of articles exceeded the limit to export in a StArt readable format, we took the database's maximum limit. It was the case in IEEEXplore (1.000), Scopus (2.000), and Web of Science (1.000).

3.2.2 The risk of bias due to the existence of few law studies

We noticed few law journals in the searched databases during the continuous analysis of the results. After consulting the Scimago Journal Rank with ‘Law’ as the subject, we extended the search to the following databases: Oxford Press Journals, Taylor & Francis Online, and Springer. The result was positive; however, the two first databases could not export the results in a readable format. Therefore, we took the first 200 articles ordered by relevance and used Mendeley’s browser extension to capture the metadata. Once uploaded in Mendeley, we exported in RIS format to StArt. Finally, we reached 10,451 articles.

StArt automatically excluded 2,487 duplicate entries. We used the Score Value (Fabbri et al., 2016) calculated by StArt to select the papers. We adjusted the calculation method: three points per occurrence of keywords in titles, one point per occurrence in abstracts, and two points per occurrence of keywords in keywords. We exported the list of papers to Excel and calculated the score value's quartile limits. Then, we rejected the articles below the fourth quartile (Score Value ≤ 14) and accepted 1,852 articles, the first exclusion and inclusion criteria.

The second exclusion criterion was then applied by reading the titles and abstracts of the accepted papers. We searched for themes we discovered outside the research's scope during the analysis. The main articles' themes excluded in this stage were: classification in legal documents; crime or corruption prediction; cybernetics law of requisite variety; e-government; e-justice; environmental law; e-waste; Forensics; genetic regulatory networks; green ICT; ICT4D; law compliance systems; law enforcement; legal advisor systems; legal decision support; legal policy effects simulation; legal requirements engineering; legal teaching; missile/vehicle guidance law; renewable energy; semantic legal metadata; and voltage regulator. At the end of this stage, we rejected 1,151 papers outside the research scope and further 152 duplicates.

We examined the remaining 549 articles again, but beyond the abstract. We found out that four articles were in a language (Japanese and Chinese) that we did not select; one was a thesis, two were duplicate, and 24 were not available in the full open text.

Finally, we reached a sample of 518 articles imported to NVivo12, which we used in the coding and analysis stage.

We chose NVivo for the reasons Bandara et al. (2015) expressed, except for the ready access to the software through an institutional license and prior experience using the tool. Otherwise, the easy access to different sources (e.g., vendor's forums, youtube, universities libraries) of guidance to use the software in a literature review is another critical reason we can add to Bandara et al.'s (2015) list.

3.2.3 The risk of bias among different legal systems

We noticed a new possible bias source concerning the imbalance in the different legal systems. Most of the law journals' papers were from countries with a common-law system,

mainly from the UK (e.g., Government Information Quarterly; Computer Law & Security Review; The European Journal of International Law; Journal of International Economic Law) and the USA (e.g., Stanford Law Review Online; California Law Review; Iowa Law Review).

Civil and Common Law are the main legal systems within the United Nations Member States. Civil Law is the legal system in 40% of the countries as a mono-system, while 12% adopt pure Common Law. Together with Muslim Law and Customary Law, their hybrid versions are present in 46% of the Members States (University of Ottawa JuriGlobe Research Group, 2020). Civil law and Common law systems have taken on various cultural forms worldwide, but there are some trademark characteristics. Table 3.2 describes features that distinguish the two systems, rendering the Common law system a less prescriptive status.

Table 3.2 Comparing Common Law and Civil Law Features

Feature	Common-Law System	Civil Law System
Typical Countries	Former British colonies or protectorates, including the United States	Former French, Dutch, German, Spanish or Portuguese colonies or protectorates, including much of Central and South America. Most of the Central and Eastern European and East Asian countries also
Written constitution or codified laws	Not always.	Always. Systematic codification of countries' specific codes (e.g., civil code, corporate law, administrative law, tax law)
Judicial decisions	Binding. Pre-eminent position to case law	Not binding. Precedence to written law. Case law is a secondary source.
Judge position	Adversarial system. The judge acts moderating between two opposing parties.	Inquisitorial system. The judge is actively involved in investigating the facts of a case.
Writings of legal scholars	Little influence.	It may have a significant influence.
Freedom of contract	Extensive. Few provisions are implied in the contract by law.	Less freedom. Many provisions are implied in a contract by law, and parties cannot contract out of specific provisions.

Note. Adapted from "Key Features of Common Law or Civil Law Systems Public Private Partnership" by Worldbank, n.d., "International legal systems - An introduction" by United States Department of Justice, n.d., and "Classification of legal systems and corresponding political entities" by University of Ottawa JuriGlobe Research Group, n.d.

We followed Bandara et al.'s (2015, p. 162) recommendation to assess and minimize the risk of bias by investigating the top ten ranked law journals. We used the following databases filtered by categories: Clarivets Web of Science (Ethics; Law), Google Scholar (European Law;

Ethics; Law; Technology Law), Scimago (Issues, Ethics and Legal Aspects; Law; Management, Monitoring, Policy and Law). APPENDIX A lists the top ten ranked journals in each database.

The UK and USA journals' dominance appeared again. However, it was possible to identify titles from the Netherlands (e.g., Journal of Business Ethics), Germany (e.g., German Law Journal), Spain (European Journal of Psychology Applied to Legal Context), and Switzerland (Maastricht Journal of European and Comparative Law).

We cross-checked these journals with the articles identified in the SLR process. We found that the accepted list of papers already included 26 articles from the fourth quartile, to which we added 45 from the second and third quartiles.

We consulted the journals that did not appear in the SLR search to assess the editorial line. Thus, we discarded the following journals as they did not meet the research proposal: European Journal of Psychology Applied to Legal Context, Journal of Experimental Criminology, Journal of Quantitative Criminology, Legal Medicine, and Weather and Climate Extremes.

We searched the journals German Law Journal, IIC-International Review of Intellectual Property and Competition Law, and Maastricht Journal of European and Comparative Law, and we found 35 more articles (6, 26, and 3, respectively).

Therefore, we added 73 papers from the scope review to the previous sample of 518 articles: the 45 articles from top-ranked law journals found in the 2nd and third quartiles, and the 35 new papers from law journals, totalizing a sample of 671 articles.

3.2.4 Quality threshold criteria for primary literature

Once we imported the papers to NVivo, we ran a simple “keyword in context” (KWIC) query with steemed words to see which terms frequently appeared (‘data’ with 0,69% weighted percentage was the most frequent word).

To detect the most relevant literature, we explored, from the word cloud, the words ‘law’ (0,67%), ‘legal’ (0,47%), ‘regulering’ (0,43%), ‘ethics’ (0,27%), and ‘policy’ (0,22%) and used them as drivers to focus on the target topic of the research. We grouped the search query with stemmed words automatically generated by the word cloud function and ran a single text search.

This search showed the frequency of each file's terms, which we used to organize the list in descending order. We then exported the list to Excel and took the fourth quartile as our primary literature sample, comprising 161 articles, which concentrated 56% of the target terms.

The next step of the article quality filtering was to assess the impact factor of sources and forward-searching the primary literature using the Google Scholar tool to identify papers citing them. To avoid the underevaluation of recently published papers, we took the same strategy as Bandara et al. (2015) and used the average citation frequency per year.

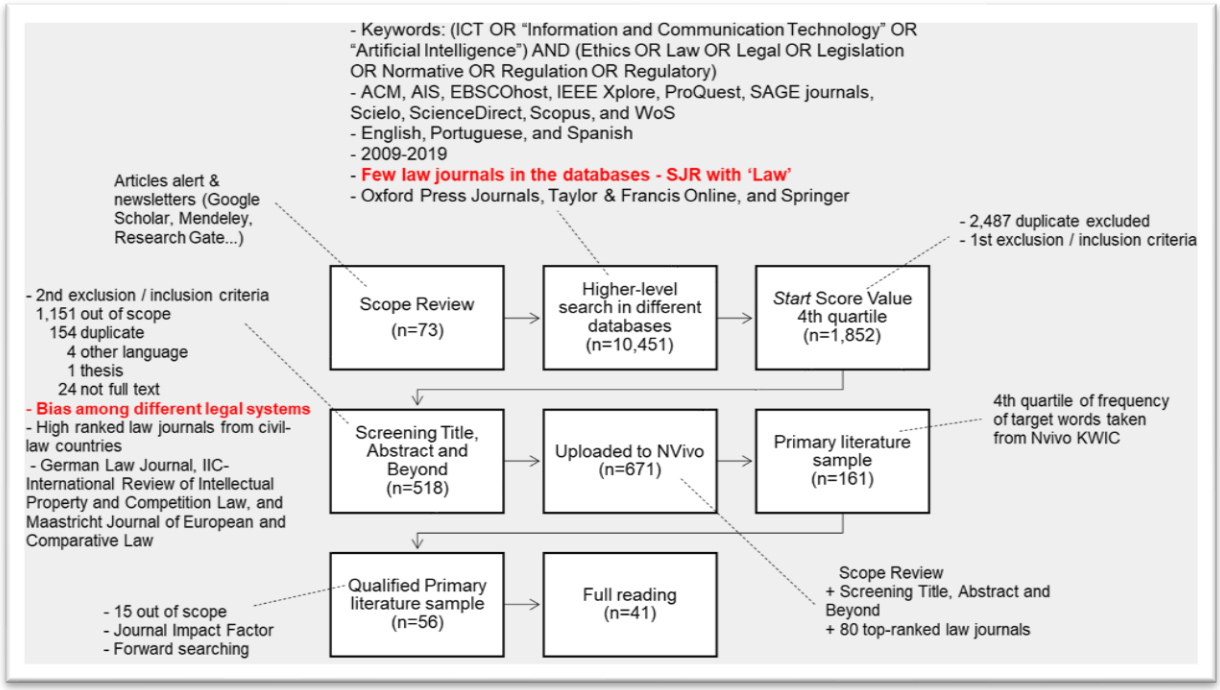
We considered the Scimago Journal Rank (2018 SJR and H Index) and the Google Scholar (2018 Google h5 index) for impact factors. For the journals of the primary literature sample, the median of each index was SJR (0.559), H index (29), and Google h5 (21). We selected papers with higher average citations per year and performance above the median value in at least two indexes.

The conference papers were selected based on the average citation per year. With whatever average for 2019-2018 conferences and a minimum of one citation per year for 2017-2016 ones. Before that, with a minimum of two citations per year.

We excluded another fifteen papers during the reading because they did not concern the regulation or lawmaking process, consistent with the second exclusion criterion (e.g., compliance with Freedom of Information or Data Protection legislation, Legal requirements engineering).

We then got a final set comprising 41 papers, listed in APPENDIX B, which we read in full and analyzed as described in the subsequent sessions. Figure 3.1 summarizes the SLR steps.

Figure 3.1 Systematic Literature Review steps



Source: by the author

3.2.5 Coding strategy

In the first coding cycle (Saldaña, 2009), we used Attribute Coding, with a deductive approach, for the basic concepts (e.g., theories, key concepts, research methods), and In Vivo Coding mixed with Descriptive Coding, with an inductive approach, to identify topics concerning the challenges faced by regulators in the ICT regulation process, organizing them with Pattern Coding in the second coding cycle. We recognized the challenges whenever the authors expressly associated problems, limitations, concerns, and challenges to the "regulators", "lawmakers", "legislators", "policy-makers", or the country's legal system.

3.3 Findings

3.3.1 Sample overview

Table 3.3 shows about 42% of articles from journal countries with a civil law system against 58% from common-law countries.

Table 3.3 Articles' distribution by journal and corresponding country's legal system and research field based on Scimago Journal Rank

Legal System	Articles	Journal	Country	Area[b]	Category[b]
Civil	1	International Journal of Social Robotics	Germany	Computer Science	Computer Science (misc.)
	1	Common Market Law Review	Netherlands	Social Sciences	Law
	2	Ethics and Information Technology		Computer Science	Computer Science Applications
	1	European Journal of Operational Research		Computer Science	Computer Science (misc.)
	1	Information and Management		Computer Science	Information Systems
	3	Journal of Business Ethics		Arts and Humanities	Arts and Humanities (misc.)
	3	Philosophy and Technology		Arts and Humanities	History and Philosophy of Science
	1	Robotics and Autonomous Systems		Computer Science	Computer Science Applications
	3	Science and Engineering Ethics		Nursing	Issues, Ethics, and Legal Aspects
Common-law	1	European Journal of Information Systems	UK	Computer Science	Information Systems
	1	European Journal of International Law		Social Sciences	Law
	3	Government Information Quarterly		Social Sciences	E-learning
	1	Information Communication and Society		Social Sciences	Communication
	2	Information Systems Journal		Computer Science	Computer Networks and Communications
	1	Information Technology for Development		Computer Science	Computer Science Applications
	1	Journal of International Economic Law		Economics, Econometrics, and Finance	Economics, Econometrics, and Finance (misc.)
	4	Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences		Engineering	Engineering (misc.)
	1	Review of Policy Research		Social Sciences	Geography, Planning, and Development
	2	Telecommunications Policy		Engineering	Electrical and Electronic Engineering
	1	AI Magazine	USA	Computer Science	Artificial Intelligence
	1	California Law Review		Social Sciences	Law
	1	IEEE Access		Computer Science	Computer Science (misc.)
	1	MIS Quarterly		Computer Science	Computer Science Applications
	1	Proceedings of the IEEE		Computer Science	Computer Science (misc.)

Source: Compiled by the authors from Scimago Journal Rank (https://www.scimagojr.com/). Accessed on Oct. 6, 2019.
Note: a) We did not include three conference articles (African Conference on Information Systems & Technology and International Conference on Cyber Conflict, CYCON) once Scimago Journal Rank did not index them. b) Subject Area and Category with the best Quartile on Scimago Journal Rank.

Computer Science (~37%) and the Social Sciences areas (~21%), which include the Law field (~8%), concentrate the field distribution. Nevertheless, none of the 35 articles from the last specific search on qualified Law journals passed the quality threshold criteria.

The Journals with a significant contribution (39%) were Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences; Government Information Quarterly; Journal of Business Ethics; Philosophy and Technology; and Science and Engineering Ethics. None were from the College Senior Scholars' Basket, keeping the pattern that Mingers and Walsham (2010) observed in their study about ethical issues. Government Information Quarterly was the only one recommended by the Special Interest Group of Electronic Government.

Different authors contributed only once to this set of papers, except Luciano Floridi and Brent Mittelstadt, from the University of Oxford, who published twice in Science and Engineering Ethics. Luciano Floridi authored or co-authored three papers from our sample, and ten other articles cited his work. Most of them referring some concepts of his theory of information ethics (Floridi, 2006) as the informational entropy of the ''infosphere'', which Pagallo (2015) suggests as an alternative to help embed normative constraints into ICTs, and should be the focus of the studies about the decisions of lawmakers.

Most of the articles were conceptual (61%, or 25 papers), a few were empirical (27%, or 11 papers), and the remaining were literature reviews (12%, or 5 papers). This conceptual nature assumed the form of essays, frequently without an express theoretical perspective (84%). Usually, they discuss an existing or proposed a new model (e.g., Barclay, 2014) or framework (e.g., Sokolovska & Kocarev, 2018; Hacker, 2018). Only 27%, or 11 of them, used a specific theory or group of theories, and they are listed in Table 3.4.

Table 3.4 Articles with specific theory(ies) and corresponding methodological strategies

Theory	Articles	Methodological Strategies
Governance	(Wu, 2014)	Case study
Habermas' Communicative Action	(Stahl et al., 2012)	Archival research
Habermas' Discourse ethics	(Schlagwein et al., 2019)	Case study
Kant's concept of autonomy	(Pagallo, 2012)	Essay
Policy networks Theory	(Relly & Schwalbe, 2016)	Archival research
Public-Value and Stakeholder Theory	(Scholl & Bolívar, 2019)	Case study
Soft System Methodology, Business analytics methodology, and Markula's ethical framework	(Vidgen et al., 2019)	Action research

Theory	Articles	Methodological Strategies
The Westphalian paradigm of Law	(Pagallo, 2015)	Essay
Thomas Aquinas' Natural Law	(Dainow, 2013)	Essay
Utilitarianism	(Zhou & Piramuthu, 2013)	Essay
Policy networks Theory	(Relly & Schwalbe, 2016)	Archival research

Source: by the author

Sokolovska and Kocarev (2018) were the only collaboration between scholars from Law and IS fields, contributing to discussing the privacy concept under its technical and legal understanding.

3.3.2 The Literature Review articles

Table 3.5 presents the analysis of the literature review articles we have found in the sample (five papers).

Except for Kunyenje and Chigona (2019), which researched the influence of external actors - multilateral institutions, international organizations or agencies, bilateral donors, and multi-national private firms – on National ICT policy in developing countries, the other literature review papers focused on ethical aspects rather than on regulation itself. Ethical aspects, which Floridi (2018) calls digital ethics, embrace the studies that evaluate moral problems relating to: "data and information (including generation, recording, curation, processing, dissemination, sharing and use), algorithms (including AI, artificial agents, machine learning and robots), and corresponding practices and infrastructures (including responsible innovation, programming, hacking, professional codes, and standards), in order to formulate and support morally good solutions (e.g., good conduct or good values)".

Two of them (Mittelstadt & Floridi, 2016; Novitzky et al., 2015) studied the ethical concerns involving the privacy dilemma in healthcare. Novitzky et al. (2015) investigated the ethics involved in researching, testing, and using Ambient Assisted Living Technologies for people with dementia, while Mittelstadt and Floridi (2016) studied the ethical issues in the Big Data context in a narrative review. North-Samardzic (2019) has also explored privacy and data-sharing issues related to biometrics used in business.

Table 3.5 Analysis of Literature reviews articles

References	Kunyenje & Chigona (2019)	Mahieu et al. (2018)	Mittelstadt & Floridi (2016)	North-Samardzic (2019)	Novitzky et al. (2015)
Research Theme	National ICT policy in developing countries	Digital ethics	Ethical issues in the context of Big Data	Biometrics and business ethics	Ethical issues of Ambient assisted living technologies
Methodological reference	Boell & Cecez-Kecmanovic (2015)	Scientometric method (van Eck & Waltman, 2014)	NI[(a)]	NI	NI
Databases	NI	Web of Science (WoS) journals arbitrarily selected	Web of Science, Scopus, Global Health, PhilPapers, PubMed, and Google Scholar	Business Source Complete, ProQuest Central, and ScienceDirect, plus arbitrarily Journals.	Web of Knowledge, SpringerLink, and the meta-database Scirus (Elsevier).
Time frame	2000 – 2016	2000 – 2016	NR[(b)]	NI	NR
Search strings	Search terms: policy formulation, actors in policymaking, national ICT policy, factors influencing policymaking, and influences of external actors on ICT policy in developing countries.	They used 35 different search terms (e.g., Computer ethic*, Data protection, Digital ethic*) to which they attributed a score to ponder how specific to digital ethics.	One turn for "Ethics of biomedical big data", and another for "Ethics of big data" Example: WoS: TOPIC: ((ethic* OR moral*) (health* OR *medic* OR bio*) ‘‘big data’’)	Search the terms "biometric" and "ethics" in the abstract.	Ten rounds of search with different combinations of strings: "ambient intelligence", "ambient assistive living", "(AAL)", "assistive technologies", "supportive technologies",…
Sources	Journal articles, conference proceedings, theses, books, and industry reports. They included highly referenced books on public policy.	The first step focused on two journals. Then, it expanded to terms occurring in the title, abstract, and author keywords. English and academic articles only.	Included hand-searching and backtracking, not only peer-reviewed journals but commentaries, working reports, white papers, and books.	Peer-reviewed journal articles. Medical research and public health articles, business publications, or book reviews were removed.	Languages are not limited to English. They included backward search articles and those found during the scope review.
Final corpus	21 sources	8031 sources	68 sources	15 sources	186 sources
Software support	No	VOSviewer	NVivo 10 for the second cycle analysis	No	No
Law journals’ Articles	None	NA[(c)]	2	7	1

Note: (a) NI: Not informed. (b) NR: No restriction. (c) Not available

Notwithstanding that some of the papers did not expressly indicate the guideline used, the methodological steps they described - database selection, search strings construction, time range, language and type of sources filtering, inclusion and exclusion criteria applied, screening and quality assessment of retrieved publications - follow the SLR's standard (e.g., Webster & Watson, 2002; Kitchenham, 2004; Moher et al., 2009).

Kunyenje and Chigona (2019) and Novitzky et al. (2015) declared their studies systematic reviews, but the former did not detail the databases used and the inclusion and exclusion criteria applied.

Three articles (Mittelstadt & Floridi, 2016; North-Samardzic, 2019; Novitzky et al., 2015) used a multidisciplinary approach by selecting several databases that would embrace the fields matching the study objective. The authors chose a different set of databases, the Web of Science (WoS) being the only one in common in two of them.

Mahieu, van Eck, van Putten, and van den Hoven (2018) restricted their scientometric study on digital ethics to WoS as well and searched first in two journals arbitrarily selected - Ethics of Information Technology and Information, Communication & Society – to make sure that they would show up by adding the result to the general search turn. Novitzky et al. (2015) added publications not returned from the search, which they understood as relevant, while Kunyenje and Chigona (2019) and Mittelstadt and Floridi (2016) did not restrict the sources to peer-reviewed articles, including conference proceedings, theses, books, working reports, and white papers.

Except for Kunyenje and Chigona (2019), the reviews succeeded in including articles from the law journals within the top-ranked law journals that we identified in section 3.2.3 - BMC Medical Ethics, Ethics and Information Technology, Journal of Business Ethics, Science and Engineering Ethics.

3.3.3 Regulator’s challenges

Table 3.6 describes regulators’ challenges found in 21 articles from the SLR. The remaining articles did not mention regulators’ challenges but dealt with high-level analysis connecting ethics guidelines to legal rules (e.g., Charlesworth, 2012) and are not included in Table 3.6.

Table 3.6 Group of regulators' challenges found in the literature review

Group	Challenges	Sources[(a)]	Example of coded passage
Technical issue	Access to the data and the algorithms	[6]	Victims of algorithmic discrimination, ... generally, they will not even be able to establish a prima facie case of discrimination without access to the data and the algorithms. Anti-discrimination law alone does not provide such access. (Hacker, 2018)
	Algorithmic discrimination	[6]	Technically, algorithmic bias therefore has two main sources (biased training data; unequal ground truth) with a number of sub-categories. This would not amount to a regulatory problem if one could be confident that the market will eliminate algorithmic discrimination over time. Unfortunately, such hopes seem to be ill-founded. (Hacker, 2018)
	Cybercrime	[1][12][13]	…the development of cybercrime legislation is fractured and often results in a lacuna in the laws of the land as countries struggle to keep pace with the rapidly evolving face of cybercrimes (Barclay, 2014)
	Embed legal measures into technology	[11]	…the first challenge of the information revolution concerns the difficulty of traditional state action to preserve people's rights and whether this problem can be addressed by embedding legal safeguards into technology. (Pagallo, 2012)
	Embodying data, harnessing unpredictability, and disentangling a person from instrument	[3]	The essential, distinguishing facets of robotics portend a new set of challenges centered around embodying data, harnessing unpredictability, and disentangling person from instrument. The question naturally arises as to how these new experiences will affect law and legal institutions. (Calo, 2015)
	Ethics by Design	[16][20]	On the other hand, another challenge to realizing programmed code of ethics depends on attitudes from the lawmakers and regulators to the emerging "Ethics by Design" principle. (Weng et al., 2015)
	Military use and integration of emerging AI and robotics	[8][19]	It is designed to help technology developers, policy-makers, decision makers, and other stakeholders identify and broadly consider potential ethical issues that might arise with the military use and integration of emerging AI and robotics technologies of interest. (Wasilow & Thorpe, 2019)
	Multi-layered platform networks of the ICT ecosystem	[3][4]	For instance, Leinweber & Madhavan (2001) note that it is impossible for regulators to police bulletin boards and chat rooms and that many investors have lost money after following false share tips. Regulators are therefore presented with these new investor protection problems that are difficult to control. (Fisher & Harindranath, 2004)
	Special zones for AI robotics misuse	[20]	Though "Tokku" itself is a regulatory tool for easing radical ethics disputes, we worry that it might be misused which will result in unwanted human-robot relationships. (Weng et al., 2015)
Legal issues	Competition and conflict between different forms of regulation	[6][12]	Still, there are some other cases where competition and conflicts between different forms and sources of regulation can be trickier. (Pagallo, 2015)

Group	Challenges	Sources[(a)]	Example of coded passage
Legal issues	Compliance is necessary but insufficient	[5]	When policy-makers, both in political and in business contexts, wonder why we should engage in ethical evaluations when legal compliance is already available (this is a recurring topic in the discussion of the GDPR, for example), the answer should be clear: compliance is necessary but insufficient to steer society in the right direction. (Floridi, 2018)
	The current system of sources is dualistic	[12]	Second, contrary to the "legal monism" of the Westphalian model, the current system of sources is dualistic because it comprises social norms and contracts, as distinct or even opposed to the political planning of lawmakers and governance actors. (Pagallo, 2015)
	Integration of autonomous agents into the current responsibility and liability regimes	[3][16]	From the perspective of science and technology policy studies, the technical developers and policy makers are confronted with crucial questions concerning responsibilities and ethics as autonomous vehicles are developed and deployed.... The second is how these new autonomous agents are to be integrated into the current responsibility and liability regimes for driving. (Schuelke-Leech et al., 2019)
	Law enforcement	[6][11][18]	Still, lawmakers have proposed and, sometimes, requested private companies to employ technical and organizational measures in order to guarantee the enforcement of the law. (Hacker, 2018)
	Path dependence resulting from capture by interest groups	[18]	Entrenched regulation of a legacy industry conflicts with the creation of a new industry, leading to regulatory path dependence resulting from capture by interest groups. (Vogelsang, 2017)
	Regulatory uncertainty	[4]	The dilemma is that where technological developments create problems for regulators, regulatory certainty is often removed. (Fisher & Harindranath, 2004)
	Transnational law and the agency of non-state	[12]	First, today's system is tripartite, rather than bipartite: in addition to the traditional sources of national and international law, in which the only relevant actors used to be the sovereign states, the system includes the sources of transnational law and the agency of non-state, or private (as opposed to public), actors. (Pagallo, 2015)
Environmental issues	AI apocalypse view could distract policy-makers	[19]	Otherwise, devoting disproportionate attention and resources to an unlikely AI apocalypse could distract policy-makers from addressing AI's more immediate challenges cited earlier in this article and, furthermore, discourage research on AI's numerous social and legal impacts. (Wasilow & Thorpe, 2019)
	China benchmark	[2][8][11][12][19]	After the Chinese ''Great Firewall'' and the technological skills of authoritarian regimes mentioned in the introduction, Western countries should not keep internet users on similar paths, automatically enforced through systems of filters and re-routers, detours and dead-ends of the avuncular legislator (Pagallo, 2012)
	Court cases brought by the regulated industry	[16]	…and court cases brought by regulated industry shape the agenda for other policy institutions (Jasanoff, 2009) (Schuelke-Leech et al., 2019)
	Failure or scandal push/fatalities	[16]	Considerations of fault and failure are essential to discussions of responsibility: responsibility, accountability and related concepts do not figure in policy makers' discussions in the absence of a failure or scandal. (Schuelke-Leech et al., 2019)

Group	Challenges	Sources[(a)]	Example of coded passage
Environmental issues	Business lobbying	[2][10][14][15]	It became clear that lobbyists had strongly advocated for the flexible regulation approach also with regard to resource requirements, which presented a challenge. (Scholl & Bolívar, 2019)
	Complexities and asymmetric information	[18]	In cases where regulators lack sufficient judgment ability this is meant to deal with complexities and asymmetric information involved in regulation by letting stakeholders negotiate. (Vogelsang, 2017)
	Cooperation between regulators	[4]	Comments were made on the differing levels of cooperation received from national regulators, some were deemed to be bureaucratic and fussy while others were thought to be slow and inefficient. (Fisher & Harindranath, 2004)
	Find a good equilibrium between players	[18]	The regulator has to resolve some of the complexities. In particular, the regulator manages externalities between players and tries to find a good equilibrium as the focal point for the coordination game between stakeholders. (Vogelsang, 2017)
	ICT standard-setting bodies disputes	[7]	A number of new actors have emerged on the scene and are actively competing with these traditional standard-setting organizations (SSOs) in one way or another. Such a paradigm shift can be rather problematic for trade policy-makers. (Liu, 2014)
	Insufficient resources	[4]	at least one respondent clearly disagreed, saying that regulation and regulators lag behind the industry due to insufficient resources being directed to the area of regulating the delivery of financial services via the Internet (Fisher & Harindranath, 2004)
	Multidisciplinary	[9]	We conclude that to get a thorough understanding of, and grip on, all the hard ethical questions of a digital society, ethicists, policy makers and legal scholars will need to familiarize themselves with the concrete and practical work that is being done across a range of different scientific fields to deal with these questions. (Mahieu et al., 2018)
	Multiple stakeholders	[1][16][18][21]	Conflicts among objectives may occur when different stakeholder groups are taken into considerations. (Barclay, 2014)
	Old regulated markets against new unregulated markets	[18]	In particular, there is a clash in general between technical or organizational innovations and old regulated industries if old regulated markets are challenged or replaced by new unregulated markets. (Vogelsang, 2017)
	Physical borders are increasingly irrelevant	[4][11][15]	In this new era of borderless, technology-mediated trade, old regulatory frameworks that emphasise 'regulation' at the expense of 'promotion' and 'innovation' may indeed be somewhat inadequate. (Fisher & Harindranath, 2004)
	Proximity and rapport of all primary stakeholders	[15]	Yet, due to near proximity and good rapport that all primary stakeholders in the DLT regulation had, the process of drafting the principles, considering and amending the proposals, and turning them into robust legislation was swift and precise. (Scholl & Bolívar, 2019)
Societal objectiv	The complexity of human interaction	[12]	All in all, there are a number of fields in which only the unintentional dynamics of social intelligence, rather than the master plan of legislators and policy makers, can achieve satisfactory results vis-à-vis the complexity of human interaction. (Pagallo, 2015)

Group	Challenges	Sources[(a)]	Example of coded passage
Societal objectives	Risks of paternalism	[11]	…we can address the final challenge to design in IT law, that is, the menace of treating people as if they were unable to understand what is harmful or useful to them on the internet. (Pagallo, 2012)
	Moral imagination of the public and policy-makers.	[16]	Yet the matter of responsibility weighs heavily in the moral imagination of the public and policy makers…. For instance, the researchers found that people in Western cultures have a greater preference for saving children over the elderly than people from Eastern cultures (Schuelke-Leech et al., 2019)
	True values important to the diverse stakeholders	[1]	Tools such as the value-focused thinking approach (Keeney, 1994) would be useful in identifying and structuring societal objectives, thereby focusing on the true values important to the diverse stakeholders. (Barclay, 2014)
Individual behavior/trace	Congress and public administration lack expertise	[3][15][16]	The guide explicitly acknowledges that government does not hold all necessary expertise, and consequently needs the input from stakeholders. (Scholl & Bolívar, 2019)
	Confidence in professional and trade organizations	[16]	…policy makers often rely on professional and trade organizations to create professional codes and standards (recommended practices and guidelines)
	Deregulation aversion	[18]	This includes that regulators are threatened by deregulation, even though the new service could create a new opportunity for regulation. (Vogelsang, 2017)
	National culture	[4]	Several respondents mentioned that national culture often influenced the flexibility, bureaucracy, and efficiency of the regulators concerned. (Fisher & Harindranath, 2004)
	Technological somnambulism	[16]	This failure of complex systems is hidden behind what Langdon Winner (2014) calls “technological somnambulism,” in which people tend to adopt and incorporate new technologies without reflecting sufficiently on the impacts or implications....What we identified is that there are two persistent narratives that are significant for an assessment of “technological somnambulism” on the part of policy makers. (Schuelke-Leech et al., 2019)

Note: (a) [1] (Barclay, 2014); [2] (Benvenisti, 2018); [3] (Calo, 2015); [4] (Fisher & Harindranath, 2004); [5] (Floridi, 2018); [6] (Hacker, 2018); [7] (Liu, 2014); [8] (Lubin, 2018); [9] (Mahieu et al., 2018); [10] (Nemitz, 2018); [11] (Pagallo, 2012); [12] (Pagallo, 2015); [13] (Pagallo, 2018); [14] (Relly & Schwalbe, 2016); [15] (Scholl & Bolívar, 2019); [16] (Schuelke-Leech et al., 2019); [17] (Sokolovska & Kocarev, 2018); [18] (Vogelsang, 2017); [19] (Wasilow & Thorpe, 2019); [20] (Weng et al., 2015); [21] (Zhou & Piramuthu, 2013)

The second coding cycle resulted in recognizing six groups of challenges with the ICT regulation mentioned by the authors.

The first group, Technical issues, concerns computational limitations and decision-making modeling complexity. Examples of these limitations and complexity we can find in themes like cybercrime (e.g., Barclay, 2014), algorithmic black box (Hacker, 2018), military use of AI (e.g., Wasilow & Thorpe, 2019), ethics by design (e.g., Schuelke-Leech, Jordan, & Barry, 2019), control of data and privacy in a multi-layered ICT ecosystem (Calo, 2015).

The second group, Legal issues, concentrates on challenges involving specific aspects of the law field. For instance, the new legal sources of law in information and automated society (Pagallo, 2015), the conflicts between legislation, and different forms of regulation (e.g., Pagallo, 2012), path dependency (Vogelsang, 2017), regulatory uncertainty (Fisher & Harindranath, 2004), and the like.

The third group, Drivers, includes externalities or unexpected events that can trigger the regulation process, like the apocalyptic cinematic vision of AI (Wasilow & Thorpe, 2019), failures, accidents, or death caused by autonomous vehicles, and court cases (Schuelke-Leech et al., 2019), and the China regulatory benchmark over internet access (Pagallo, 2012).

The fourth group, Environmental issues, concerns challenges related to the political environment in which the regulation process occurs. An arena with multiple stakeholders with different interests (e.g., Zhou & Piramuthu, 2013), access to information (Vogelsang, 2017), worldviews, values, and bargaining and lobbying power (e.g., Benvenisti, 2018), in which the issues discussed require a multidisciplinary approach (Mahieu et al., 2018). Besides, we included challenges concerning geopolitical aspects like sovereignty and jurisdiction, the size and complexity of the country's political organization (Scholl & Bolívar, 2019), and the dispute between traditional technical standard-setting organizations, such as the International Organization for Standardization (ISO) or the International Telecommunication Union (ITU) and new US-based ICT standard-setting bodies (Fisher & Harindranath, 2004).

The fifth group, Societal objectives, considers philosophical and sociological questions as the complexity of human interaction (Pagallo, 2015), paternalism (Pagallo, 2012), and moral values (e.g., Schuelke-Leech et al., 2019).

The last group, Individual behavior or trace, concentrates on regulators' characteristics, for example, educational background (e.g., Calo, 2015), deregulation aversion (Vogelsang, 2017), cognitive capacity, culture, and bounded rationality.

3.3.4 The law field discarded contributions and the gray literature

We investigated the articles from law journals that were discarded based on the quality threshold to assess what types of contributions we could have missed. Most of the findings fit one of the codes in the literature review. For example, the concern about access to data being increasingly offset by technological means (Trakman, Walters, & Zeller, 2019) fits in the code "access to the data and the algorithms" in Table 3.6.

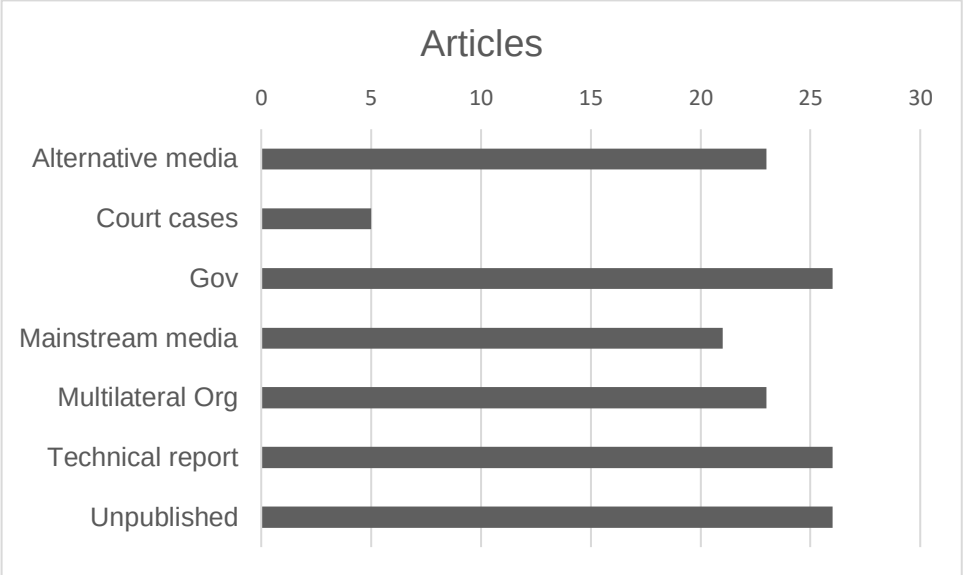
However, there were a few new contributions. One is the difficulty in handling intellectual property protection of personal data once the general population is unaware of and does not understand how their data is being used or the "multi-layered approach and direction that data protection laws have assumed to date" (Trakman et al., 2019). Another is the cultural and ideological resistance to introducing a foreign regulatory model, like patent protection in China (Zhang & Bruun, 2017) or the European "precautionary principle" dealing with uncertainty, which the US does not officially adopt as a general principle (Guerra, 2018).

Another missed contribution is the exclusion of books or sections of books (e.g., Brown & Marsden, 2013) and gray literature (e.g., IEEE, 2019; Palmerini et al., 2014; Walsh et al., 2019) as a qualifying criterion for SLR.

We investigated the 41 articles in our final literature review sample regarding the type of references cited. We found that the authors used as references books and gray literature from different sources such as court cases (e.g., European Court of Human Rights in Benvenisti, 2018), government agency reports, or official documents (e.g., White House Website in Cath, Wachter, Mittelstadt, Taddeo, & Floridi, 2018), mainstream media news (e.g., The New York Times in Taylor, 2017), alternative media (e.g., technical reports from private companies and NGO), and unpublished articles, as illustrated in Figure 3.2.

Table 3.7 lists the primary references to reports or working papers from multilateral organizations, reports or technical standards produced by companies or non-governmental organizations, and alternative online media referenced in the SLR final sample (APPENDIX B).

Figure 3.2 Gray literature referenced in the final SLR sample



Source: by the author

Table 3.7 Gray literature sources referenced in the final SLR sample

Source	Web page	Articles
	Multilateral Organizations and Government	
European Commission	https://ec.europa.eu/info/index_en https://op.europa.eu/en/home	[3][5][7][9][11][12][15] [16][21][24][30][34][35] [36] [37][38]
United Nations	https://www.unov.org/unov/en/library.html https://www.un-ilibrary.org/ https://www.unglobalpulse.org/	[9][12][13] [16][17][33]
European Parliament	https://www.europarl.europa.eu/portal/en https://eur-lex.europa.eu/homepage.html?locale=em	[3][11][15][16]
OECD	https://www.oecd.org/ https://www.oecd-ilibrary.org/	[12][23][24][40]
World Bank	https://www.worldbank.org/en/home https://elibrary.worldbank.org/	[16][17][22][23]
European Data Protection Supervisor	https://edps.europa.eu/_en	[11][13][28]
ITU	https://www.itu.int/en/Pages/default.aspx	[17][36][40]
	Standard-setting organizations and Commercial Technical reports	
IEEE	https://www.ieee.org// https://ieeexplore.ieee.org/Xplore/home.jsp https://spectrum.ieee.org/	[6][15][26][38]
McKinsey	https://www.mckinsey.com/	[4][11][25][33]
Google	https://support.google.com/ https://policies.google.com/	[1][2][36]
CEPS	https://www.ceps.eu/ceps-publications/	[16][35]
ISO	https://www.iso.org/home.html	[10][38]
PWC	https://www.pwc.com/	[10][35]

Source	Web page	Articles
RAND Corporation	https://www.rand.org/	[15][26]
Royal Society	https://royalsociety.org/	[11][13]
	Alternative media	
wired.com	https://www.wired.com/	[2][3][14][16][20][26] [27]
cnet.com	https://www.cnet.com/	[2][20][27]
eff.org	https://www.eff.org/	[8][12][27]
propublica.org	https://www.propublica.org/	[11][15][22]
heritage.org	https://www.heritage.org/	[22][27]
mashable.com	https://mashable.com/	[2][16]

Source: by the author

3.4 Discussion and research agenda

Despite the current concern in society about the regulation of the ubiquitous and disruptive emerging ICT, we concluded this SLR by confirming that it is a theme still unexplored in the qualified literature (peer review papers meeting our specified quality criteria).

The analysis of the selected 41 papers showed a significant influence from the philosophy field, naturally focusing on emergent ICT's ethical concerns.

There was a high number of conceptual works (essays), a characteristic that North-Samardzic (2019) and Stahl, Eden, Jirotka, and Coeckelbergh (2014) associate with the typical nature of the philosophy field towards a descriptive position rather than a prescriptive or normative one.

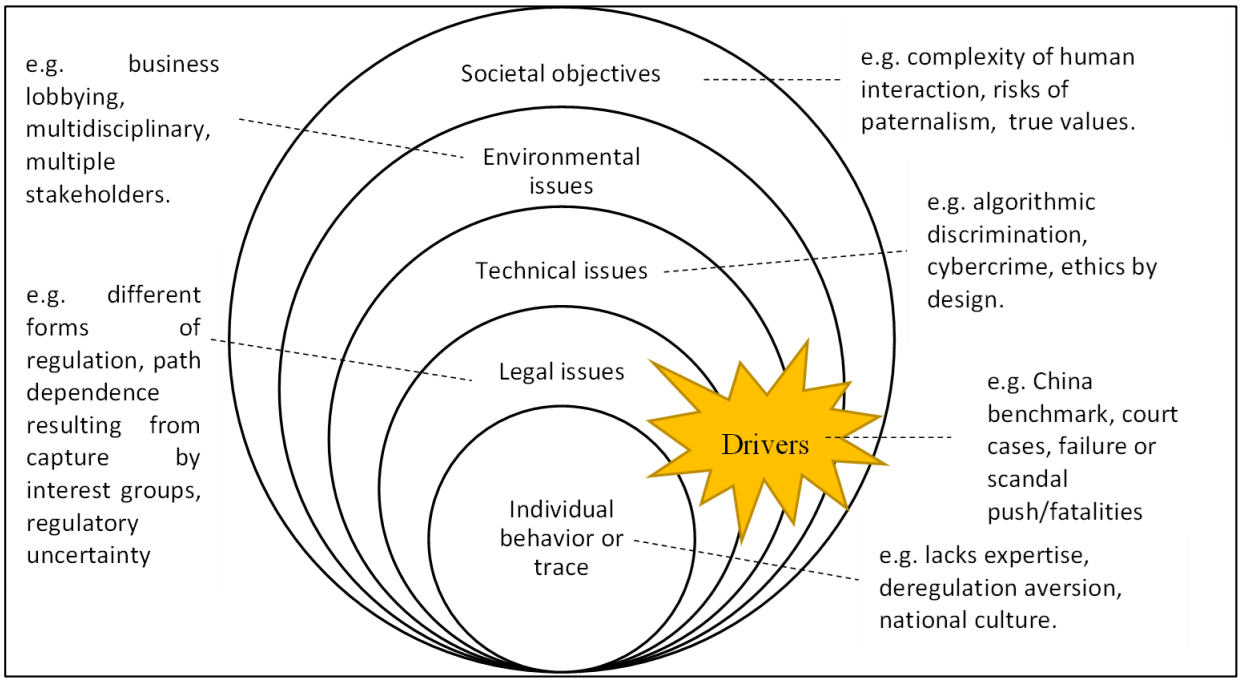
Luciano Floridi and Jürgen Habermas appeared as the most used theoretical lens. Mingers and Walsham (2010) recognize Floridi's theory's potential but point out the difficulties of expanding the reach of moral norms to all informational entities compared to Habermas' discourse ethics theory. It may explain why we did not find empirical studies based on Floridi's theory of information ethics. The same did not happen to Habermas' theory, which Schlagwein, Cecez-Kecmanovic, and Hanckel (2019) and Stahl, Doherty, and Shaw (2012) used in their empirical studies, which are still scarce. Particularly those that go further than the archival analysis of documents, such as transcripts from congressional hearings or policy directives (Relly & Schwalbe, 2016), and that can help to answer the question proposed by Winfield and Jirotka (2018) on how to assess regulatory bodies' action and the linkage with public engagement, necessary to build public trust in new technologies.

We can take some insights for a research agenda from our sample's five literature review articles. The first involves the side effects or unintended outcomes of national ICT policy in developing countries and the role of external influences, as explored by Kunyenje and Chigona (2017), but that can concentrate on the influence power of BigTech companies.

Another suggestion concerns the ethical challenge of dealing with the privacy of health data in biomedical Big Data applications and the risk of the "whiplash effect" (Mittelstadt & Floridi, 2016), by which legislation and policies overreact to perceived harms. We can connect this suggestion to Novitzky et al.'s (2015) encompassing the complex issue of informed consent of persons with dementia to use ambient assisted living technologies. Indeed, the challenges to regulating the development and application of new technologies able to monitor the health data of each individual in a landscape of an aging population and budget restrictions over the public sector will require researchers to investigate and help policymakers to find ways to make sure that these artifacts will ease the burden on the public health care system rather than increase the pressure on it (Jensen, 2019).

Notwithstanding appearing marginally in the articles, we got an answer to our research question through the challenges in the regulation of emergent ICT pointed out by the authors, like those to the conventional border of national legal systems (Pagallo, 2012); the asymmetry of lobbying power over regulators (Relly & Schwalbe, 2016) innovated by social media power in shaping voters' preferences and, consequently, politicians' (Benvenisti, 2018); the overlap of rules; and the challenge of a multistakeholder and multidisciplinary environment. We classified these challenges into six groups: Societal objectives, Environment issues, Technical issues, Legal issues, Individual behavior or trace, and Drivers. The classification is not clear-cut and mutually exclusive. However, it depicts levels of analysis illustrated in Figure 3.3, expanding the classification of regulatory challenges proposed by Eggers & Turley (2018) and OECD (2019) that researchers can take to study the problem, for which we can devise a research agenda summarized in Table 3.8.

Figure 3.3 Levels of analysis of challenges in regulating ICT



Source: by the author

Table 3.8 Research agenda

Level of analysis	Research problem
Societal objectives	The risk of paternalism by regulators against the capacity of people, or specific groups, to understand the harms of specific technologies.
	Identify true values important to the various stakeholders and how they are shared.
Environment issues	Agenda-setting, discussions, and negotiations, primarily through Drivers that can trigger the regulation.
	The differences in the ontological position of the multidisciplinary environment regarding the ICT regulation problem.
Technical issues	Research toward developing a “regulated self-regulation” (Schulz & Held, 2005) digital business ecosystem.
Legal issues	Development of legal enforcement mechanisms that ensure companies follow norms, standards, and best practice guidelines effectively.
	Civil and criminal liability of autonomous agents in partnership of IS and Law fields.
Individual behavior and trace	Individual aspects of decision-making through Drivers that can trigger the regulation.

The overarching level of analysis, “Societal objectives”, feeds much of the current academic production around ethical and sociological issues involving the development and use of new ICT and the social impacts on human relationships, work, business, and politics. In this level, aspects that are perhaps still little explored and deserve more attention are the risk of paternalism by regulators and identifying true values important to the various stakeholders.

These ethical and social issues are still present but gain an operational approach in the "Technical issues" group, which embraces themes that have received growing attention from the IS field (e.g., embedding legal measures into technology, military use and integration of emerging AI and robotics, and the multi-layered platform networks of the ICT ecosystem). These researches are essential to developing a "regulated self-regulation" (Schulz & Held, 2005) digital business ecosystem.

Nevertheless, the contribution of the IS field is not limited to this group. Although the topics in the "Legal issues" group do not seem the most attractive to IS researchers, their contribution would be vital to creating legal enforcement mechanisms that ensure companies follow norms, standards, and best practice guidelines effectively. In addition, research related to the civil and criminal liability of autonomous agents must have the partnership of IS researchers due to their leading role in developing the systems. It requires the unusual integration of Law field scholars and IS researchers.

The group of difficulties "Environment issues" and "Individual behavior and trace" are perhaps the most challenging for empirical research due to the recognized complexity of the political environment, the difficult access to actors of the political or government administration elite, the risks of a behavior biased by the concern with the image, in addition to the political and economic conjuncture. An exciting alternative for researchers is to take advantage of the "Drivers", comprising externalities or unexpected events that can trigger the regulation process, to explore individual aspects of decision-making and the political environment by investigating the agenda-setting, discussions, and negotiations in a multistakeholder and multidisciplinary environment.

It makes more relevant Mahieu, van Eck, et al.'s (2018) call for multidisciplinary studies to bridge the gap between different fields about concepts and vocabulary to ensure that they talk about the same things. So, researchers looking to understand the differences in the ontological position of the various academic fields about the ICT regulation problem are welcome.

This SLR demonstrates the challenge of integrating knowledge from various domains, which is common in the IS field (Bandara et al., 2015; Webster & Watson, 2002).

We had to deal with the risk of bias due to few law studies and the bias concerning the different legal systems, as most papers were published in common-law country journals (UK and USA). We tried to overcome these limitations by adopting Bandara et al.'s (2015)

suggestions to assess and include databases that could better cover the field of interest and hand-searched top-ranked law journals that met our purpose of including studies from civil-law countries.

However, the journal articles did not pass the quality criteria based on journals' impact factor indexes and the average citation frequency per year. This limitation of our study raises questions about using different quality criteria in a multidisciplinary SLR according to each area's culture. The matter is to realize in advance when necessary and how to do it acceptably.

Another limitation concerns the exclusion of other sources from the SLR like books (e.g., Ribeiro, 2016, Brown & Marsden, 2013), working papers (e.g., Eggers & Turley, 2018; Walden & Christou, 2018), and guidelines (e.g., Palmerini et al., 2014). It is probably one of the reasons for the terms "technical" and "juridical" never appearing side by side in Mahieu et al.'s (2018) scientometric study.

These are intrinsic limitations to an SLR that shall not be adopted as a general approach to literature reviews under the claim of 'rigor' once it does not have the same meaning in other fields (Boell & Cecez-Kecmanovic, 2015).

The Law field is characterized by publishing in student-edited law reviews (e.g., Yale Law Journal, Harvard Law Review), not peer-reviewed, which audience are local judges, law clerks, law students, lawyers, and policy-makers (Collins, 2018). Besides, it has low citation levels (Harzing & Alakangas, 2016) and is written in the native language, increasing the English language bias risk to systematic reviews and meta-analyses (Egger et al., 1997). The only exception would be international law, which could explain the difficulty in reaching this local-oriented production from civil law countries observed in our study.

These characteristics challenge the IS and Business Management fields commonly used SLR guidelines to trace and integrate into dialogue with law scholars. The same happens the other way around (Guerra, 2018). There is a blind spot between the fields caused by the criteria used to qualify the sources. It results in knowledge construction involving emerging ICT with a tight and dissociated worldview. Something that is not peculiar to the theme nor exclusive to the Law and IS fields. Multidisciplinary collaboration is an ideal hard to achieve but necessary for a holistic approach, which Jeroen van den Hoven calls "Comprehensive Engineering" (Maedche, 2017), necessary to balance the positive and negative outcomes of emergent ICT.

Based on this exploration, we could devise some practical advice from our experience for those planning to integrate their literature review with the Law field.

First, the search in different databases will not guarantee access to the state-of-art literature in the Law field, mainly in a national context study. A possible strategy is the one used by Mahieu et al. (2018) to consult a group of academics in the field and test for “false negatives”, asking them to provide a list of the most important texts and authors on the theme before they had seen any list of publications from the dataset. A survey with law scholars to confirm the top-ranked sources and learn more about their quality assessment practice would be a valuable research contribution. Proquest, Web of Science, and Springer databases showed the best results to cover Law Field but still need to be complemented by specific sources not indexed like the German Law Journal, IIC-International Review of Intellectual Property and Competition Law, and Maastricht Journal of European and Comparative Law. Besides, these hand-searched sources collected from student-edited law reviews or journals not indexed require different quality assessment criteria. One alternative is to use law field citation-based rankings like Washington and Lee School of Law (2021), being cautious of possible under-coverage of non-English publications.

Second, the journal’s country is a possible proxy to minimize the bias due to the difference in law systems, but it will hardly work for the Muslim law system. The researcher affiliation could be an alternative but more challenging to raise and treat due to co-authorship. Besides, it does not guarantee the researcher's origin and actual “legal culture”.

Third, we suggest special care to build the search string with the term “regulat*” in order to avoid articles from medicine, engineering, or biology involving the regulatory aspect of any system, like “genetic regulatory networks” or “voltage regulator”. Besides, the search string needs to distinguish between four subfields: ICT regulation in business and society; regulation process assisted by ICT; regulation compliance supported by ICT; and regulation enforcement by ICT.

Fourth, and maybe most importantly, is to consider whether the systematic literature review is essential and adequate for the research purposes or not. A good starting point is to ponder how narrow and precise the research question is (Boell & Cecez-Kecmanovic, 2015).

Lastly, searching electronic databases needs to be complemented by books and ‘‘gray literature’’ (Petticrew & Roberts, 2006) found in multilateral organizations (e.g., European

Commission, United Nations), government pages, private companies, and NGOs (e.g., IEEE, McKinsey).

3.5 Conclusion

This literature review shows the difficulties of covering multidisciplinary themes like the ICT regulation, which needs to join academic fields with a production culture and quality assessment standards so different as IS and Law fields. The review results following the steps of a systematic method contributed to an overview of the production on the theme and helped to answer the research question through insights into the difficulties regulators face in regulating ICT. However, these results shall be taken as the first stage of a mixed-method broad review, in which the uncovered fields need to be complemented by sources qualified according to the area's culture.

Notwithstanding the current concern about the theme, the production is still immature, taking a conceptual nature focused on the ethical aspects. Jürgen Habermas appeared as a promising theoretical lens for empirical studies.

We coded authors' mentions of difficulties in regulating emergent ICT, and we classified them into six groups: Societal objectives, Environment issues, Technical issues, Legal issues, Individual behavior or trace, and Drivers. This novel classification indicates possible levels of analysis and opportunities for future research.

We can devise a research agenda that is very rich and perhaps somewhat challenging. Multidisciplinary collaboration underlies the ICT regulation theme is a challenge to scholars not used to integrating with the Law field. The limitations to this SLR, concerning the application of quality criteria and the exclusion of not peer-reviewed articles, demonstrate these challenges. We hope to have contributed with some practical advice from our experience for those planning to integrate their literature review with the Law field.

A necessary step for future research is to investigate the differences in the ontological position of the various academic fields regarding the ICT regulation problem. It is essential because, depending on how policy-makers receive support from Academia about social, ethical, and economic issues, the legal framework is different, with consequences to the business environment, civil society rights, and the scientific development of the IS field.

4 FOUNDATION, EXPLORATORY ARCHIVAL ANALYSIS, AND INTERVIEWS

REGULATORS' DIFFICULTIES IN REGULATING ICT: A HABERMASIAN ANALYSIS WITH THE HELP OF THE MULTIPLE STREAMS FRAMEWORK[6][7][8][9]

Abstract

The speed of emerging Information and Communication Technology (ICT) evolution and the related concerns about adverse outcomes put pressure on lawmaking's incremental pattern. The ICT regulation can become an additional hurdle for a country like Brazil, with multiple administration levels in a civil law system. We conducted an empirical study using Habermas' Theory of Communicative Action (TCA) with the help of the Multiple Streams Framework (MSF) to investigate the difficulties in ICT regulation and how regulators try to overcome them. It is a qualitative research on the three levels of administration in Brazil (Federal, State, and Municipal levels), focusing on the specialized Science and Technology Committees from the legislative houses. We mixed the archival analysis of public records of meetings held in 2019 with interviews with parliamentarians and technocrats who participated in the Public Hearings. We describe the groups of actors present in the discussions and analyze the performance and difficulties of the Committees at the three levels of Administration. The multistakeholder and multidisciplinary scenario and the time constraints difficulties gained new dimensions concerning emerging ICT discussions. We separated the critical analysis of the difficulties into those commonly observed in the political environment and those proper to the discussions about emerging ICT. We picture the preferred ICT regulation process, showing interest groups' strategic points of action to influence proposals for laws and infra-legal regulations and the importance of critical actors.

[6] A shorter version of the article, authored by Galhardo, J. A. G., & Souza, C. A., was presented on the 25th Americas Conference on Information Systems (AMCIS 2020) on Aug 10, 2020. Available at https://aisel.aisnet.org/amcis2020/adv_info_systems_research/adv_info_systems_research/16/.

[7] A shorter version of the article, authored by Galhardo, J. A. G. & Souza, C. A. was submitted to the Journal of Information Technology for the special issue "Regulation in the Age of Digitalization", on Feb. 13, 2021, and was rejected on Jun. 14, 2021.

[8] A shorter version of the article, authored by Galhardo, J. A. G. & Souza, C. A. was submitted to the MIS Quarterly for the special issue "Digital Technologies and Social Justice", on Jun. 29, 2022, and was rejected on Jul 14, 2022.

[9] A shorter version of the article, authored by Galhardo, J. A. G. & Souza, C. A. was submitted to the MIS Quarterly, on Aug 7, 2022.

Keywords: ICT regulation, Regulators, Habermas, Multiple Streams Framework, Legislative Committee, Elite Interview.

4.1 Introduction

In recent years, there has been much discussion and development of ethical principles, mainly concerning Artificial Intelligence (AI) (e.g., High-Level Expert Group on Artificial Intelligence, 2019; IEEE, 2019) due to the expected effects on jobs, risk of bias in algorithms of systems to support decision making (e.g., sentencing for criminals), the "bubble" and "echo chamber" cognitive traps of social media disinformation (Bradshaw & Howard, 2019), physical harm by automated devices and use of AI in weapons. Data privacy, confidentiality, access control, and security of personal information are other aspects that have fuelled the debate, as they are at the core of the Internet of Things (IoT) and Smart Cities solutions (e.g., Comisión Económica para América Latina y el Caribe (CEPAL), 2018).

Despite the consensus around the main ethical principles (Transparency, Justice & fairness, Non-maleficence, Responsibility, Privacy, Beneficence, Freedom & autonomy, and Trust) (Jobin et al., 2019), the consequences in case of violation are still unclear, feeding the development of management procedures to deal with legal and regulatory risks (Carolina, 2019) or the demand for new regulations.

The matter is how to do it without hindering innovation and autonomy. This concern increasingly echoes in different arenas where emerging technologies are discussed. It is an everyday discourse among governments, politicians, and bureaucrats. Besides, it is present in scientific forums, media, organized civil society, and business. The uncertainties and risk of adverse outcomes of these new technologies for the Sustainable Development Goals (SDG) give rise to the call for an Omni-stakeholder approach to the public policy process (UNESCO, 2019a). A movement that International Multilateral Organizations positively support.

This kind of technology fear is not new. For example, the invention of the motor car illustrates a case of technological advancement that completely changed the way of life, whose adverse outcomes had to be learned in practice to be overcome or mitigated by employing traffic and liability rules, control devices, structure for enforcement, and policies to deal with the consequences of the sudden obsolescence of old technology.

The Technology Assessment movement in the early '70s, when the US Congress created a structure to assist lawmakers with technical issues, was a milestone in the ICT regulation process. Such assistance no longer exists and is needed today (Gedye, 2019) when the speed of evolution and potential scale of a new technology's effects put pressure on the incremental pace of lawmaking that has worked so far. In this scenario, government ICT regulation towards the “shared value” concept by Porter and Kramer (2011) is an ideal difficult to achieve.

In the ICT regulation process, the various interests with their different bargaining power are brought to the political-technocratic regulatory arenas at a country's local, regional and national levels, depending on the legal distribution of legislative power related to the ICT issue under discussion. Often with an overlap between levels, as is the case in Brazil.

The complex distribution of regulatory power between multiple administration levels for a developing country with a civil law system highlights the importance of the lawmaking process, becoming one more competitive hurdle to the insertion in the fourth industrial revolution, added to the constraints on physical infrastructure and human resource capacity (Walden & Christou, 2018).

Additionally, what makes the Brazilian context of ICT lawmaking interesting is the past leadership and the supposedly successful ICT lawmaking experience (e.g., Freedom of Information Act 2011 and Civil Rights Framework for the Internet Act 2014), its present conjuncture (right-wing wave, economic stagnation, and high unemployment rate), competitive legislative agendas (e.g., moral, economic, social security, corruption, environment, violence), its structural bottlenecks (e.g., lack of basic infrastructure, poor educational performance), and its cultural traits (distrust of politicians, and the “Brazilian way” of doing things (Ferreira et al., 2012)).

In the landscape of ethical governance described by Winfield and Jirotka (2018), in which ethics (or ethical principles) lead to standards (soft rules), which in turn lead to regulation (hard rules), we found few empirical studies in our literature review and an imbalance in favor of the study of ICT-related ethics. The growing awareness of the need for ethics that has been feeding the proliferation of new ethical principles for robots, especially AI, in the last few years (Winfield & Jirotka, 2018) explains this imbalance.

This research intends to help fill this gap by answering the questions: What are the difficulties in regulating ICT, and how do regulators try to overcome them?

The purpose is to identify the obstacles and challenges to regulating ICT through the perception of protagonists: politicians and specialized bureaucrats from the executive branch involved in legislative or regulatory proposals discussions. The specific objectives are: to identify the actors, understand the communicative action toward shared knowledge and accepted values, investigate the possible reasons for difficulties, and identify existing and possible solutions.

The ICT regulation construct embraces the rulemaking of laws and subordinate rules by all government levels (OECD, 1997) and the public policy process, considering the interactions of actors, events, contexts, and outcomes (Weible, 2017).

This study has a critical research philosophical position based on Jürgen Habermas' Theory of Communicative Action (TCA) (1984, 1987). We opted for Habermas' TCA based on the recognition of the IS field (e.g., Ngwenyama & Lee, 1997; Klein & Huynh, 2004; Myers & Klein, 2011) and its use in empirical research (Schlagwein et al., 2019; Stahl et al., 2012).

To help provide a bridge between the real world and Habermas' idealized conception of Lifeworld (Habermas, 1987), we used some of the assumptions from the Multiple Streams Framework (MSF) proposed by John Kingdon (1995).

The research is a single-case study of the Legislative's political-technocratic environment in Brazil, with embedded units of analysis (Yin, 2018) concerning the three Administration levels (Federal, State, and Municipal), specialized Science and Technology Committees (SCs) of legislative houses, the different groups of actors (e.g., legislators, parliamentary assistants, bureaucrat experts, academic or practitioner experts, business and labor representatives, customers or civil society representatives) who participated from the discussions in 2019, and the individuals as the smallest unit of analysis.

The first stage was an exploratory archival analysis of public records produced by SCs in 2019, mainly video records of the meetings and Public Hearings. The second stage focuses on interviews with a sample of the SCs' members and specialized bureaucrats from executive offices and public prosecutors that participated in the Public Hearings. Following the dramaturgical model Myers and Newman (2007) proposed, the interviews were unstructured with a photo-diary approach (Latham, 2003), answering the call for a methodological perspective on ICT regulators beyond archival document studies (Relly & Schwalbe, 2016).

We describe the group of actors in the multistakeholder and multidisciplinary regulatory arena. We found the main themes discussed at each administration level and the actors who

had relevant participation, some of them due to Focusing Events. We analyzed the difficulties in Habermas' System domain through MSF's concepts. Ambiguity, Time constraints, Problematic Policy Preference, Strait Individual Awareness, and Fluid Participation were all recognized in different ways in the interviewees' speeches. In Habermas' Lifeworld domain, we found that Public Hearings sought to attend to the Ideal Speech Situation but failed due to the necessity parliamentarians have to play a role to their constituents and because of the lack of active participation of those potentially affected. The role of traditional mass media and social media and the difficulties in assessing the validity of arguments, including disinformation, were also analyzed. We then picture some of the interviewees' speeches' values, needs, and concerns. We complemented the critical analysis of the difficulties separating those commonly observed in the political environment from those related to emerging ICT discussions. The Colonization signals of Habermas' Lifeworld allowed us to describe the ideal regulation process.

In the next section, we present the synthesis of the literature review and theoretical foundations. Then, we describe the method, the findings, the discussion, and the conclusion with implications, limitations, and the agenda for future studies.

4.2 ICT Regulation Process Foundations

4.2.1 Literature Review

Much of the literature about ICT regulation was born on initiatives from multilateral organizations to address the best practices of regulatory governance and the ethical and social implications of digital transformation (e.g., ILO, 2021; OECD, 2020; UNESCO. Information for All Programme (IFAP), 2007; World Bank, 2021).

Likewise, soft rules government agencies, like The National Institute of Standards and Technology – NIST/USA, and traditional technical standard-setting organizations, such as the International Organization for Standardization (ISO) or the International Telecommunication Union (ITU), are incorporating ethical discussions in different technical standards (e.g., road-sign, smart-home and smart city technologies, cybersecurity) (e.g., Executive Office of the President of the United States of America, 2016; High-Level Expert Group on Artificial Intelligence, 2019). Nevertheless, the traditional technical standard-setting organizations

have lost leadership in the global ICT standards game for new US-based consortia (e.g., Zigbee Alliance, Organization for the Advancement of Structured Information Standards consortium, Open Geospatial Consortium), giving rise to a new frontier of trade dispute (Liu, 2014).

One of the agreements between the categories of challenges to regulators proposed by OECD (2019) and Eggers & Turley (2018) are the disruptions brought by emerging technologies and regulators' risk-aversion in adapting regulatory structures. It is the intrinsic dilemma in technology regulation (Collingridge, 1980). While there is a lack of knowledge on how emerging technologies affect marketplaces and society in the early stages, it may be too late or costly to reverse when the technology is well-developed and disseminated. The dilemma is stressed nowadays due to technological evolution's speed and the effects' disruptive scale (Jensen, 2019). It feeds the call for flexible legislation capable of evolving along with the technology regulated (UNESCO. Information for All Programme (IFAP), 2007) and for responsible research and innovation as a way to regulate in early stages, even in the dark (Palmerini et al., 2014).

Another agreement from OECD (2019) and Eggers & Turley (2018) involves liability assignment and price formations due to the blurring of the boundaries between vendors, facilitators, customers, and producers in the sharing economy and the information asymmetries of the digital economy. It hampers the desired "fit-for-purpose" regulatory frameworks and their enforcement (Eggers & Turley, 2018; OECD, 2019).

We reviewed the literature from a higher-level search strategy through various databases, identifying articles published in journals and conference proceedings from 2009 to 2019, with the search string: abstract: (ICT OR "Information and Communication Technology" OR "Artificial Intelligence") AND abstract: (Ethics OR Law OR Legal OR Legislation OR Normative OR Regulation OR Regulatory).

The analysis of the selected 41 papers showed a significant influence from the philosophy field, naturally focusing on emergent ICT's ethical concerns. Except for Kunyenje and Chigona (2019), which researched the influence of external actors on National ICT policy in developing countries, regulators were not the focus of the studies.

Luciano Floridi and Jürgen Habermas appeared as the most used theoretical lens. The latter shows the advantage of being used in empirical studies (Schlagwein et al., 2019; Stahl et al., 2012), which are more scarce. Particularly those that go further than the archival analysis of documents, such as transcripts from congressional hearings or policy directives

(Relly & Schwalbe, 2016), and that can help to answer the question proposed by Winfield and Jirotka (2018) on how to assess regulatory bodies' action and the linkage with public engagement, necessary to build public trust in new technologies.

4.2.2 Habermas' Social Theory of Communicative Action

Habermas' theory is recognized and has been used in different studies in the IS field. This production contributes to understanding the concepts and the potential for using his theoretical framework, as illustrated in Table 4.1.

Table 4.1 Contributions to the conceptualization and potential use of Habermas' theoretical framework in the IS literature

Authors	Title	Contribution
Lyytinen & Klein (1985)	The Critical Theory of Jürgen Habermas as a Basis for a Theory of Information Systems.	Typology of Action in Habermas' theory and overview of the theory of Knowledge interests.
Ngwenyama & Lee (1997)	Communication richness in electronic mail: Critical social theory and the contextuality of meaning	Key TAC concepts and connection with another theory (Information Richness Theory)
Froomkin (2003)	Habermas@Discourse.Net: Toward a Critical Theory of Cyberspace	Uses the Discourse ethics as a basis for analyzing Internet standards processes
Klein & Huynh (2004)	The critical social theory of Jürgen Habermas and its implications for IS research	Key concepts of the theory of Knowledge interests and TAC
Mingers & Walsham (2010)	Toward ethical information systems: The contribution of discourse ethics.	Key concepts of Discourse ethics and proposed approach "Legitimacy and effectiveness" for the IS field
Myers & Klein (2011)	A Set of Principles for Conducting Critical Research in Information Systems.	Overview of Habermas' critical research and main concepts of "cognitive interests", "communicative action", "lifeworld" and "system".
Schlagwein, Cecez-Kecmanovic, & Hanckel (2018)	Ethical norms and issues in crowdsourcing practices: A Habermasian analysis	Use of Discourse ethics concepts as a basis for insights and critique of the status quo with a multi-method and multilevel approach

Source: by the author

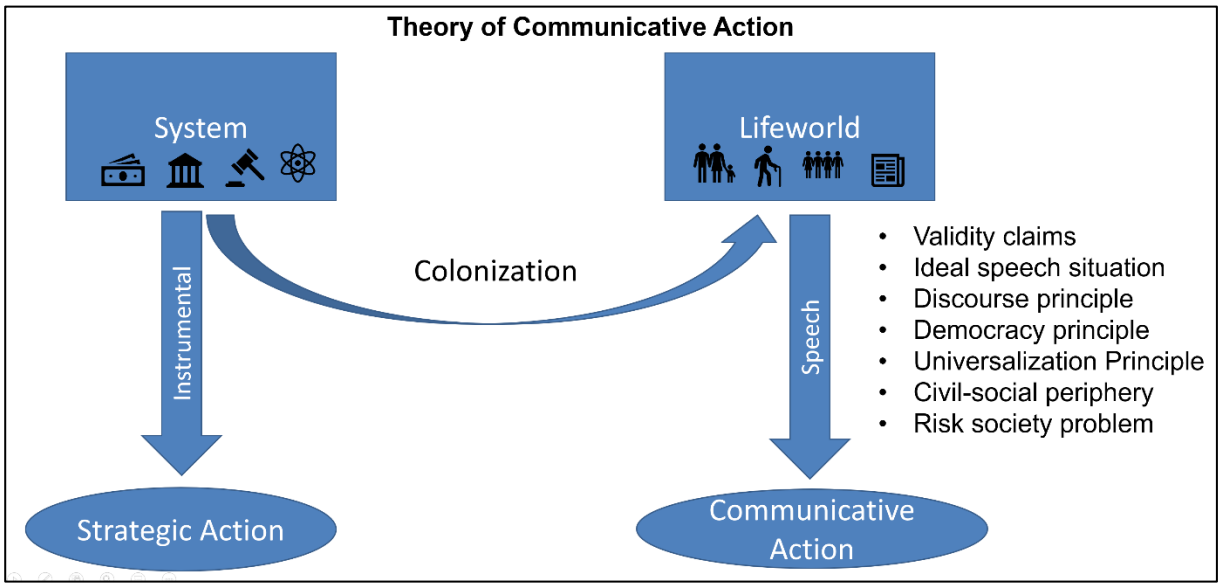
Habermas' TCA offers concepts and principles about rationality, knowledge, communication, ethics, and politics. He begins by classifying "Knowledge Interests" (Habermas, 1972a) as "Technical", "Practical," and "Emancipatory", the latter being at the core of the Critical Social Philosophy (Lyytinen & Klein, 1985). Then he associates these Knowledge

Interests with three different kinds of "Social Action" (Habermas, 1972b): "Strategic", "Communicative," and "Discursive". In the TCA, he develops his most cited rational framework of society, based on communication driven to a mutual understanding from a deontological perspective. He introduced, into this framework, ethical and moral questions to achieve a concept of "Valid Norm" (Habermas, 1995), which he used in his idealized conception of "Deliberative Democracy" (Habermas, 1996).

TCA is within conflict management approaches by which inconsistent preferences are transformed through communicative collective decision-making processes (March, 1994).

Habermas represents society in two domains of action, as shown in Figure 4.1. One such domain is called “System”, where the strategic action aimed at private interests occurs through rational-instrumental reasoning. In the System, he places "Money" and "Power", which can be institutional, bureaucratic, or scientific.

Figure 4.1 Habermas TCA framework



Source: by the authors

The other domain he calls “Lifeworld” is where people cooperate by using language based on mutual understanding and shared knowledge of norms, conventions, habits, and accepted world views. He develops his society's reasoning and builds his concepts and principles in this domain. Table 4.2 describes those of interest for the research.

Table 4.2 Habermas TCA concepts and principles of interest for this research

Concept	Description
Validity Claims	Idealized assumptions for a reasoned agreement: mutual understanding of the same things by the same words and expressions (truth); mutual self-consideration to be

Concept	Description
	rationally accountable (sincerity); and the reached consensus is supported by sufficiently confident arguments as being not false or mistaken (rightness).
Ideal Speech Situation	The procedural aspect of practical discourse to test the validity of norms being hypothetically proposed, which is based on the assumptions: equal opportunity to participate and question any claims or assertions made by anyone or to propose any new one; freedom to express their attitudes, desires, or needs; without any kind of internal or external coercion, overt or covert.
Discourse Principle	Norms deserve to be valid when they get the potentially affected ones' approval as long as they participate in rational discourses.
Valid Norm	For a norm to be valid, its foreseeable consequences and side effects are freely accepted by all affected, without coercion (Universalization principle).
Democratic Principle	A norm must receive all citizens' assent through a legally constituted discursive legislative process to claim legitimacy.
Pragmatic Questions	Involves bargaining and negotiation between competing interests to agree on goals and values (e.g., business questions).
Ethical Questions	Involves genuine differences between individuals and groups that can be tolerated (e.g., ethnic or gender questions).
Moral Questions	Involves considerations of fairness for all and requires agreement by all the affected ones (e.g., environmental or scientific questions), which are the main thrust of discourse ethics.
Moral Principle	The discourse principle takes the form of a Universalization principle to justify moral norms

Source: Adapted from Habermas (1995); Habermas (1996); and Mingers and Walsham, (2010).

Habermas argues that there is an increasing instrumentalization of Lifeworld, which he calls “Colonization”. Science, or the technical elite, together with a specialized bureaucracy, form a group of experts who play a role in this Colonization process, in which economics and engineering began to dominate all spheres of life (H. K. Klein & Huynh, 2004). The law often mediates the two domains' reciprocal influence (O’Donnell & Henriksen, 2002).

The "Civil-Social Periphery", comprising "…intellectuals, concerned citizens, radical professionals, self-proclaimed ‘advocates,’ and the like" (Habermas, 1996), has played a relevant role in detecting and disclosing new problems involving the new collective goods of the "Risk Society" (e.g., environmental destruction, radiation poisoning or lethal genetic damage, and the uncontrolled side effects of large technological operations, pharmaceutical products, scientific experimentation). A role that "exponents of the state apparatus, large organizations, or functional systems" have been unable to fulfill (Habermas, 1996).

This kind of Risk Society problem requires laws with "relational programs" (Habermas, 1996) goals that induce those who cause the danger to take a new direction. In other words, laws act as a catalyst for self-monitored changes. These new problems will only reach the

"public agenda" when assumed and presented by the mass media to the larger public and echo the political system (Habermas, 1996).

However, we have digital platforms as new players that challenge the mainstream media, introducing difficulties to Habermas' view. For instance, Google and Facebook began to concentrate on media advertising-income, forcing most mainstream media to introduce paywalls. The consequence is that readers opt for free alternatives that provide information that is not curated and fact-checked, being exposed to peddlers of disinformation (European Reformists Group, 2019), turning social media into a new source of asymmetry of lobbying power over regulators (Benvenisti, 2018).

Stahl et al. (2012) used the critical discourse method following the conceptual framework of Cukier, Bauer, and Middleton (2004), based on Forester's (1989) interpretation of TCA. Habermas' Validity Claims provided the grounds for text analysis (security policies) to identify communication distortions. The authors tried to justify but recognized the limitation of a study focused exclusively on policies or any rationalized document. It loses the potential power of Habermas' framework applicable to speech.

It was not the case for Schlagwein et al. (2019), who used Habermas' discourse ethics to investigate ethical issues in crowdsourcing practices. Their longitudinal field study of three crowdsourcing communities mixed individual interviews with different actors (workers, requesters, and platform organizers) and observation through crowdsourcing engagement in two communities. Notwithstanding the conclusion that the Ideal Speech Situation is not entirely achievable in practice, the authors recognized that the framework provides a helpful guideline for assessing issues of fairness and ethics through a legitimizing process.

At this point, it is essential to consider how we could assess Habermas' idealized framework in the political scenario.

4.2.3 The Multiple Stream Framework

We compared the leading frameworks, theories, or models from the public policy field through their essential elements, the activeness of research, and the elements of the policy process that are explained or emphasized as Heikkila and Cairney (2017) describe, looking for the best alternative to represent TCA's System domain and help to bridge to the Human Lifeworld.

Table 4.3 Comparison of essential elements, activeness of research, and elements of the policy process that are explained or emphasized in the MSF, ACF, and NPF frameworks

Element	MSF	ACF	NPF
Scope	Agenda setting and policymaking under the condition of ambiguity	Coalition formation, policy learning, and policy change	Influence of narratives on public opinion, how they are structured and reflect policy beliefs, agenda-setting, policy change
Level	System, but do not pay close attention to the boundaries, and focus is on actors coupling streams	Individuals or organizations to draw conclusions about coalitions and policy subsystems	Three possible levels: micro/Individual, meso/subsystem-coalition, macro/societal
Defined concepts	Primarily the five structural elements of the framework	Numerous key concepts	Numerous key concepts, expanded further by Social-Ecological Systems (SES) framework
Assumptions	Explicitly defined, focusing on the ambiguity of decision-making, the time constraints facing policymakers, problematic preferences of actors in policy processes, unclear technology within political systems, fluid participation in decision-making bodies, and stream independence	Explicitly defined, focusing on the subsystem	Explicitly defined, it also recognizes the subsystems at the meso-level but also assumes that policy narratives operate across micro and macro levels. Besides, it assumes the world is socially constructed but susceptible to manipulation by actors telling stories
Model of the individual	Challenges assumptions of comprehensive rationality; focus on ambiguity	Boundedly rational, it emphasizes that individuals are motivated by beliefs and prone to “devil shift.”	Emphasizes the role of emotions and narration on decision-making in establishing its model of h*omo narrans* (actors tell stories to manipulate the bounded rationality of others)
Extent of publications	Numerous	Numerous	Fewer but growing
Tested in multiple contexts	Diverse policy domains, including subnational, national, and international levels	Multiple countries and settings, but with an initial bias toward the US and environmental policy	Mainly United States in a few policy contexts, but still new

Element	MSF	ACF	NPF
Methods	Mostly case studies	Mixed	Mixed
Actors making choices	Policy entrepreneurs and policymakers	Policy actors who form coalitions, act strategically, learn, etc.	Actors and groups interested in policies use narratives strategically to influence public opinion and decisions
Institutions as rules or venues of decision making	Informal rules and formal venues, recognized but institutions not emphasized	Types of policy venues and rules in the broader context, but less directly	Part of context
Ideas or beliefs	Policy solutions are proposed and amended over time to become acceptable to the policy community	Belief systems that drive policy actor behavior	Narrative strategies, grounded in belief systems and ways of thinking that are embedded in cultures
Context	National mood, policy conditions, pressure groups, admin turnover, etc.	Stable parameters - social, cultural, economic, physical, and institution structuring the subsystem	Not a core part, but recognizes legal, constitutional parameters, geography, etc., as important
Events	Focusing events draw attention to problems	External events and internal events (e.g., shocks, change to governing coalition)	Not directly addressed, but may combine with narratives to focus attention

Source: Adapted from Heikkila and Cairney (2017).

We discarded the Punctuated Equilibrium Theory (PET), the Policy Feedback Theory (PFT), the Institutional Analysis and Development framework (IAD), and the Innovation and Diffusion Models (IDM) mainly because the scope does not focus on policy change. Besides, PET, PFT, and IAD do not have explicit assumptions, while PET and IDM are mainly studied with quantitative methods. Therefore, we concentrated our analysis on the Multiple Streams Framework (MSF), the Advocacy Coalition Framework (ACF), and The Narrative Policy Framework (NPF), which main elements are described in Table 4.3.

We opted for the MSF because we understood that the defined concepts, the extent of publications, the less emphasis on institutions, the approach to the context, and the highlight of the role of focusing events are more suitable with the TCA framework for our research purpose.

Although we recognize that the MSF is a framework less sophisticated for studying policymaking than the others, we opted for it because its core concepts are more simple and have a broad intuitive appeal which makes it easier to apply without being immersed in the research program over a long period (Cairney & Jones, 2016).

The MSF has an extensive research program studying parliamentary systems and even autocracies. However, it was initially devised to study the USA's federal republican political system (Herweg et al., 2017), in which the president is independent of the legislature and has full executive power (head of state and government). The same political system in Brazil is recognized by the president's dominant role in agenda-setting (Almeida & Gomes, 2018). This common trait may explain why the MSF has been frequently applied to Brazilian reality (Almeida & Gomes, 2018). It also applies to subnational and multinational levels (Herweg et al., 2017), such as the EU (Ackrill et al., 2013).

Other elements that contributed to the choice were the context considering the “national mood” and policy conditions as interpreted by the policymakers and the role of focusing events.

The MSF proposed by John Kingdon in 1984 is derived from the Garbage Can Model (Cohen et al., 1972), in which a decision is seen as "an outcome or interpretation of several relatively independent streams within an organization". Problems, solutions, and participants flow until the occurrence of an alignment opportunity, which depends on a relatively complicated intermeshing of elements.

Based on such a concept, the MSF - initially developed for the analysis of agenda-setting - assumes that "Problem Stream", "Policy (solution) Stream", and "Political Stream" are independent processes. It emphasizes timing rather than rationality (Zahariadis, 2007) in merging these streams into a window of opportunity for agenda-setting and decision-making ("Policy Window") (Herweg et al., 2017; Weible, 2017). Frequently, it takes advantage of "Focusing Events" (Birkland, 2016) as a crisis, natural disasters, and elections. Moreover, the "Policy Window" is not achieved without a dispute between different subjects and different actors (Kingdon, 1995; Birkland, 2016), in which "Policy Entrepreneurs" and receptive policymakers play an essential role (Herweg et al., 2017).

The MSF streams' independence gives "Policy Entrepreneurs" a protagonistic role, as there would be no natural or inevitable connection between a problem and a solution (Herweg et al., 2017). They are often experts who have enhanced skills to communicate, negotiate and persuade ideas from other individuals or groups and perceive acting timing (Kingdon, 1995). Policy Entrepreneurs are not limited to traditional lobbyists. They can be policymakers, parliament members, bureaucrats, academics, intellectuals, journalists, concerned citizens, radical professionals, self-proclaimed advocates, representatives of an interest group, or any other policy-relevant actor (Herweg et al., 2017). They advocate their "pet projects" to anticipate future gains. Their strategic action includes framing the problem, affect priming, “salami tactics,” and the use of symbols (Zahariadis, 2007). The more resources (e.g., time, money, energy) and greater access to policymakers, the more their chances of success (Herweg et al., 2017).

Additionally to the stream independence, the MSF's assumptions characterize what Cohen et al. (1972) called "Organized Anarchies", described in Table 4.4, being the critical interest elements for this research.

Table 4.4 MSF "Organized Anarchies" Basic Assumptions adapted from Herweg et al. (2017)

Basic Assumption	Description
Ambiguity	The MSF denies a rational solution to a given problem and assumes the possibility of multiple solutions. More information does not reduce ambiguity.
Time Constraints	The number of issues and time constraints limit the range and number of alternatives to which attention is given.
Problematic Policy Preferences	Preferences emerge during interaction and are driven by the actor's overarching label (e.g., health, education, security, environment, or morality) and the information taken into account.
Unclear Technology (Strait Individual Awareness)[(a)]	The concept refers to a strait individual awareness of the job's responsibilities and role to the organization's overall mission.

Basic Assumption	Description
Fluid Participation	Both legislators and bureaucrats, mostly high-level civil servants, have a high turnover.

Note: (a) In order to avoid confusion with the technology concept related to the ICT papers' theme, we will hereafter refer to the basic assumption "Unclear Technology" within the text as "Strait Individual Awareness".

The following section describes the research context, the exploratory archival analysis sources and sample, the interview design, and the analysis approach.

4.3 Method

The research is a single case study of Brazil's legislative and executive political-technocratic environment with embedded units of analysis (Yin, 2018) concerning the three Administration levels, the specialized SCs of each legislative house, the different groups of actors, and the individuals as the smallest unit.

4.3.1 The Political-Technocrat Legislative Environment

We studied the three levels of Brazilian public administration and their respective legislative houses. In addition to the central government, the study focused on São Paulo state and the capital. The city and state of São Paulo are the most populous in Brazil, with 12.40 million and 46.65 million inhabitants (estimate Jul. 2021), respectively, representing 10% (city) and 32% (state) of the country's Gross Domestic Product (2019).

We identified the specialized committees in each legislative house where discussions and preliminary law proposals involving emerging ICT are concentrated. Since the Innovation and Technology Study Committee was closed, there are no specialized Committees on ICT at the local level. Therefore, we selected the Committee whose purpose seemed to be the most adequate for the study. Table 4.5 identifies the Committees and the number of members and alternates.

Table 4.5 Specialized Committees on ICT in the Legislative Houses of All Levels of Administration

Level	Legislative House	Committee	Members[a] Alternates[a]
Central/ Federal	Chamber of Deputies (CD)	Science and Technology, Communication and Informatics Committee (SCF1)[b]	30 40
		Special Committee for the Bill 2303/2015 of virtual currencies (SCF2)[b]	34 26
	Federal Senate (FS)	Science, Technology, Innovation, Communication and Informatics Committee (SCF3)[b]	17 16
State/ County	São Paulo State Assembly (ALESP)	Science, Technology, Innovation and Information Committee (SCS)[b]	11 9
Local/ Municipal	São Paulo City Council (CCSP)	Transit, Transport and Economic Activity Committee (SCM)[b]	7 0

Note: (a) Quantities refer to the number of designated politicians on Jan 26th, 2020.
(b) Acronymous for each Science Committee (F – Federal, S – State, M – Municipal) from now on.

4.3.2 Exploratory Archival Sources and Sample

The exploratory archival analysis played the role of a diary in the photo-diary interview approach (Latham, 2003) that helps anticipate interviewees' experiences and worldviews and formulate situation-specific questions (Schultze & Avital, 2011).

To select the sample of recordings, we analyzed the briefing note for each meeting held from February to December 2019, available on the respective legislative house web page, looking for a broad representation of the issues discussed. Table 4.6 presents the sample of records analyzed in each Committee. We analyzed 48 records out of 174, including 24 Public Hearings, totaling just over 78 hours of recording.

Table 4.6 Sample meeting video records of the exploratory archival analysis stage

	SC1F[a]	SCF2[b]	SCF3[c]	SCS[d]	SCM[e]	Total
Total records	65	13	49	9	38	174
Records analyzed	17	9	5	6	11	48
Public Hearings[f]	10	9	3	0	2	24
Hours of video	35:18:19	14:46:20	11:23:07	8:53:26	8:02:33	78:23:45

Source: (a) Câmara de Deputados (2022a), (b) Câmara de Deputados (2022b), (c) Senado Federal (2022), (d) Assembleia Legislativa do Estado de São Paulo (2022), (e) Câmara Municipal de São Paulo (2022; 2022b).
Note: (f) included in the Records analyzed

We complemented the exploratory archival analysis with documental sources like reports, proposals, e-Participation platform recordings, and Taquigraphic notes/Minutes of Meetings. They are all public sources available on each legislative house's web pages.

The objective was to explore these sources to identify issues discussed, points of dispute, academic guidance, presentations by invited experts, and the speeches and voting from committee members.

4.3.3 Interviews Sample and Procedures

For each Committee, we planned to interview a sample of the members, seeking a broad representation of political party wing representation, academic background, age, race, and gender, whenever possible.

Table 4.7 describes the Committees' members distribution in each legislative house by gender, race, born decade, educational level, and political party wing representation, and the distribution of those members who had a highlighted participation in the meetings analyzed.

Table 4.7 Committees population and distribution by gender[(a)], race[(a)], age[(a)], education[(a)], and wing representation[(b)]

		COMMITTEES' POPULATION						MEMBERS HIGHLIGHTED IN THE VIDEO SAMPLE					
		CD	FS	ALESP	CCSP	Total	%	CD	FS	ALESP	CCSP	Total	%
GENDER	Female	15	6	4	-	25	14%	4	1	4	-	9	31%
	Male	104	27	16	7	154	86%	8	4	4	4	20	69%
RACE	Black	1	1	-	-	2	1%	1			-	1	3%
	Brown	27	6	1	1	35	20%	0	1	1	1	3	10%
	White	91	26	19	6	142	79%	11	4	7	3	25	86%
BORN DECADE	30	1	1	-	-	2	1%	1			-	1	3%
	40	1	3	1	-	5	3%	0	1		-	1	3%
	50	16	11	3	3	33	18%	3	1	2	1	7	24%
	60	24	11	8	3	46	26%	1	3	3	2	9	31%
	70	35	6	3	-	44	25%	3		-	-	3	10%
	80	33	1	4	1	39	22%	4		3	1	8	28%
	90	9	-	1	-	10	6%	0		-	-	-	-
EDUCATION LEVEL	Elementary	1	-	-	-	1	1%	0	-	-	-	-	-
	Middle	1	-	-	-	1	1%	0	-	-	-	-	-
	High School	22	7	4	2	35	20%	2	1	1	1	5	17%
	Bachelor	90	24	14	5	133	74%	8	3	6	3	20	69%
	Master	4	1	2	-	7	4%	1	-	1	-	2	7%
	Doctoral	1	1	-	-	2	1%	1	1	-	-	2	7%
WING	Left	33	9	7	1	50	28%	6	1	3	1	11	38%
	Center	23	10	3	4	40	22%	3	2	2	2	9	31%

	COMMITTEES' POPULATION						MEMBERS HIGHLIGHTED IN THE VIDEO SAMPLE					
	CD	FS	ALESP	CCSP	Total	%	CD	FS	ALESP	CCSP	Total	%
Right	63	14	10	2	89	50%	3	2	3	1	9	31%
Total	119	33	20	7	179	100%	12	5	8	4	29	100%

Note: (a) Auto-declared information collected on the legislative house's website or the page of the Superior Electoral Court (http://divulgacandcontas.tse.jus.br/).
(b) Distribution of parties according to ideological orientation (Sardinha & Costa, 2019).

In the initial planning, we would choose, by convenience, members from São Paulo State for the federal legislative houses. However, due to the Covid-19 pandemic, we changed the interview strategy from a face-to-face interview to a videoconferencing platform-mediated one. This forced change eliminated the limitation of physical access to the interviewees, allowing members from other states.

In the public hearings analyzed, we observed the participation of invited experts from different groups, as described in Table 4.8.

Table 4.8 Number of Public hearings sessions with guests experts groups participation in each Committee

Guests on Public Hearings	SC 1	%	SC 2	%	SC 3	%	SC 4	%	SC 5	%	Total	%
Academia	3	9%	1	6%			5	100%	1	8%	10	14%
Bureaucrat	10	31%	6	35%	4	50%			2	17%	22	30%
Business	5	16%	2	12%	1	13%			2	17%	10	14%
Business Union /Association	6	19%	3	18%	3	38%			2	17%	14	19%
Expert/ Practitioner	2	6%	5	29%					1	8%	8	11%
Hybrid[(a)]	1	3%									1	1%
Labor Union /Association									4	33%	4	5%
NGO/Civil Society	5	16%									5	7%
Total	32	100%	17	100%	8	100%	5	100%	12	100%	74	100%

Note: (a) The Brazilian Internet Steering Committee (CGI.br) comprises members from the government, the corporate sector, the third sector, and the academic community.

We added to the sampling specialized bureaucrats from the executive and public prosecution service who participated in the Public Hearings and technical assistants from the committee members´ staff.

We conducted individual interviews with a minimum expected duration of 30 minutes, following the dramaturgical model Myers and Newman (2007) proposed, based on the theory of face-to-face interaction by Erving Goffman (1959). It tries to overcome an interview's common problems and pitfalls: artificiality, lack of trust, time pressure, blocking gatekeepers,

elite bias, Hawthorne effects, constructing knowledge, ambiguous language, and risk of unintentional offense. Each interview is treated as a drama with a stage, props, actors, audience, script, an entry, and an exit. Moreover, the performance depends on these components that will determine the success of disclosing important information by the interviewee and, consequently, the data's quality (Myers & Newman, 2007).

We first proposed steps to handle Myers and Newman's (2007) concerns and recommendations for each drama element. However, we had to adjust to an interview employing a videoconferencing platform due to the Covid-19 pandemic, following Archibald et al. (2019) and Lobe et al. (2020) recommendations.

We allowed the interviewee to choose the tool for the interview using a videoconferencing platform, suggesting Zoom, Microsoft Teams, or Google Meet. To set the stage, we had to subscribe to the services without time restriction; practice the recording feature; provide a reliable high-speed internet connection, a quiet and bright room, free from interferences; and take particular care, during the interview, with the camera distance and microphone sound. We use the props: a computer connected to a second video, a mobile phone to tape an audio backup, a timer, notes, and pens. We opted to use a virtual neutral background to avoid disturbing.

The exploratory archival analysis and the previous study of the interviewee's data (e.g., background, age, gender, professional experience, political party wing representation) helped increase the chance of being taken seriously and build rapport. Besides, they facilitate the first approach and negotiations with members' staff (blocking gatekeepers) to schedule the interview.

As the interview was with an "elite" participant (Dexter, 2006), we did not offer anonymization once it is easily reversible. Therefore, we expressly warned of this condition in the invitation through the Participant Information Sheet (

APPENDIX C) and the Participant Consent Form (APPENDIX D) and reinforced the research's objective, whose results will be published only in academic journals.

The interviews were unstructured. We used the previous knowledge achieved with the exploratory analysis to prepare an interview guide with a list of topics and situation-specific questions (Schultze & Avital, 2011) for each member, taking care of not being over-prepared to afford openness, flexibility, and improvisation. We forwarded three questions by e-mail, usually one week before the scheduled date. Notwithstanding the risk of over-preparation, the objective was to overcome gatekeepers' risk assessment and build the necessary rapport, enabling further questions to reveal personal values and conflict situations. For this purpose, the first question always looked for an aspect comfortable for the interviewee. The second question sought to explore aspects of the theoretical framework of the research that we could associate with the interviewees' performance in committee meetings, pushing them into the most delicate situations. The last question also sought to end the interview well, with a more sympathetic question for the interviewee to enable future contact. Table 4.9 illustrates the situation-specific question addressed before the interviews.

Table 4.9 Examples of the situation-specif question addressed before the interview

Screenshot of the video record of a meeting	Example of a situation-specif question
 (a)	P09: Question 1) Councilman, you were elected in last year's election, having the app drivers as a solid electoral base. If I am not mistaken, you are the first parliamentary representative in Brazil of this new group of people who carry out an economic activity mediated by digital platforms. Most parliamentarians still have their electoral base in the traditional economy — taxi drivers, trade unions, business associations, etc. You can start our interview by telling a little about your story to get this result. Do you think that new technologies can create new spaces for the unrepresented? How do you communicate with your voter base?
 (b)	P01: Question 2) The competence to provide public security belongs to the State. It is an area that has been expanding the use of facial recognition technologies and artificial intelligence. A use that is under question worldwide. What caught my attention was that the Committee did not debate the subject last year. I saw that you have a joint initiative with Deputy [name supressed] to take the Project City Cameras to Vale do Paraíba and North Coast Metropolitan Region. Could you explain how your interest in a particular subject arises to take it to a discussion in the Committee? Furthermore, why, in particular, was this theme not debated?

Screenshot of the video record of a meeting	Example of a situation-specif question
 (c)	P04: Question 3) A final concern you raised at the meetings is the preparation of the human capital required by high-tech companies. How can the Science and Technology Committee address this problem in the Education Committee? What difficulties do you perceive in changing the education vision that exists today? If there is no such change, what consequences do you foresee?

Source: (a) Câmara Municipal de São Paulo (2022b), (b) Assembleia Legislativa do Estado de São Paulo (2022), (c) Câmara de Deputados (2022a).

The steps we followed to collect the interviews data were:

a) phone contact the members' office to identify the assistant who plays the role of gatekeeper;
b) e-mail to the gatekeeper introducing the research with the Participant Information Sheet and the Participant Consent Form;
c) follow up by phone, e-mail, and Whatsapp;
d) once accepted the invitation, e-mail to the gatekeeper with the questions and the Participant Consent signed;
e) schedule the interview;
f) Participant Consent returned, filled, and signed;
g) interview by Zoom platform;
h) e-mail to the interviewee thanking, explaining the following steps, and the final agreements on the possible callback to clarify doubts;
i) transcription of video record;
j) e-mail to the interviewee or gatekeeper with the video record link and transcription;
k) video and transcription uploaded to NVivo.

We first contacted members' offices in October 2020 and finished collecting data in June 2021. The final sample comprises five parliamentarians (P), three bureaucrats from the executive branch (E), one public prosecutor (L) who attended Public Hearings, and two legislative assistants (A), listed in APPENDIX E. Table 4.10 and Table 4.11 describes the profile of the participants and the interview duration.

Table 4.10 Profile of regulators in the sample and interview duration

Pseudonym[(a)]	House[(b)]	Committee[(c)]	Gender	Born decade	Race	Educational Level	Wing	Video Length
P01	ALESP	SCS	Male	80	White	Bachelor	Right	39:05
P02	CD	SCF1	Male	70	White	Bachelor	Left	26:20
P03	CD	SCF2	Male	70	White	High School	Center	14:43
P04	CD	SCF1	Female	50	White	Bachelor	Right	38:51
P09	CCSP	SCM	Male	80	White	Bachelor	Right	25:17

Note: (a) Acronymous P - Parliamentary. (b) ALESP - São Paulo State Assembly, CD - Chamber of Deputies, CCSP - São Paulo City Council. (c) SCS - Science, Technology, Innovation and Information Committee, SCF1 - Science and Technology, Communication and Informatics Committee, SCF2 - Special Committee for the Bill 2303/2015 of virtual currencies, SCM - Transit, Transport, and Economic Activity Committee.

Table 4.11 Profile of bureaucrats experts, and legislative assistants in the sample and interview duration

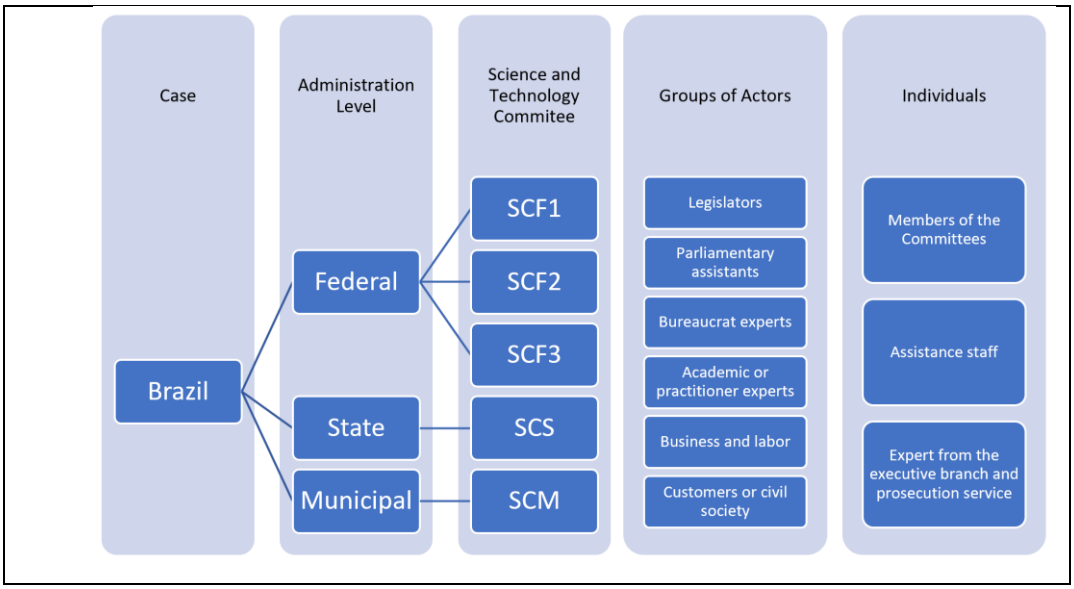
Pseudonym[(a)]	Representation	Office[(b)]	Gender	Function	Educational Level	Video Length
E05	Executive	SERPRO	Male	Blockchain Product Manager	Computer Science	22:19
L06	Prosecution Service	MPT	Male	Public Prosecutor	MSc. Law	47:20
E07	Executive	MCIT	Male	Secretary	MSc Computer Science	22:20
E08	Executive	MCIT	Female	Director	Ph.D. Law / Policymaking	47:21
A10	Legislative Assistance	FS	Male	Subchief of Cabinet	Accounting + Law	35:34
A11	Legislative Assistance	CCSP	Female	Assistant	Law	42:54

Note: (a) Acronymous E – Executive, L – Prosecution Service, A – Legislative Assistance. (b) SERPRO - Federal Data Processing Service (Public Company), MPT - The Public Labour Prosecution Office, MCIT - Ministry of Science, Technology and Innovations, FS – Federal Senate, CCSP - São Paulo City Council.

4.3.4 Analysis

There are four levels of analysis illustrated in Figure 4.2. The higher one involves the embedded cases at each administration level (Federal, State, and Municipal). Within each case, the analysis units are: the specialized SCs of legislative houses; the different groups of actors (e.g., legislators, parliamentary assistants, bureaucrat experts, academic or practitioner experts, business and labor representatives, customers or civil society representatives); and the deeper level of analysis concerns the individuals, being members of the Committees, their assistance staff, and expert bureaucrats from the executive branch and prosecution service.

Figure 4.2 Embedded levels of analysis



Source: by the author.

The first coding cycle started with Attribute Coding (Saldaña, 2009) of necessary descriptive information about Organizations (name, acronym, level of administration, sphere) and Actors' characteristics or demographics (Nickname, Name, Year of born, Gender, Race, Civil state, Level of education, Party, Wing representation).

Then, during the exploratory archival analysis of meetings video records, we used provisional coding (Saldaña, 2009) with a deductive approach, looking for explicit evidence in members' speeches about the basic MSF concepts (e.g., Ambiguity, Time Constraints, Problematic Policy Preferences), and TCA's concepts (e.g., Validity Claims, Ideal Speech Situation, Discourse Principle). Besides, the type of technology under discussion (e.g., AI & ML, Cybersecurity, Face recognition); problems raised (e.g., Bias, Country strategic dependency,

False positive); and other actors in the discussion (e.g., Specialized Bureaucrat, Business representation, Civil society representation).

We used holistic coding (Saldaña, 2009) with an inductive approach to identify hidden signals of the same basic MSF concepts, in addition to those from TCA, as well as signals of the colonization process of Habermas' "Lifeworld". Besides, the method helped to identify unexpected issues, sometimes using In Vivo coding (e.g., "Ctrl-C Ctrl-V", "Technology White Elephant"). In APPENDIX F, we present examples of each coding method used.

We transcribed the audio files on the interviews in naturalized mode (Bucholtz, 2000), privileging written over oral discourse features. Then, we coded using mixed techniques.

We used Provisional Coding with the codes already created during the exploratory archival analysis and the concepts from the theory. We expanded these codes by combining techniques (Holistic, Descriptive, and In Vivo). However, our main target was Value Coding and Versus Coding because they are adequate to lawmaking's conflicting context, the research objectives, and critical theory (Saldaña, 2009).

We tried to capture interviewees' perspectives or worldviews through Values Coding (Saldaña, 2009), representing values, attitudes, and beliefs. Some of them are Provisional codes based on TCA concepts (e.g., Truth, Sincerity, Rightness, Freedom of expression, Coercion, Fairness).

We used Versus Coding (Saldaña, 2009), appropriate for critical and policy studies, to capture the stakeholders' conflicts, tensions, and power issues. In binary terms, we identified individuals, groups, organizations, rights, concepts, benefits, and prejudices in direct conflict (e.g., Social media x Traditional mass media, New technologies x Labor market).

The last cycle used Pattern Coding (Saldaña, 2009) to classify, categorize, and group the codes created during the previous cycles, identifying major themes for the ICT regulation difficulties under the TCA conceptual framework.

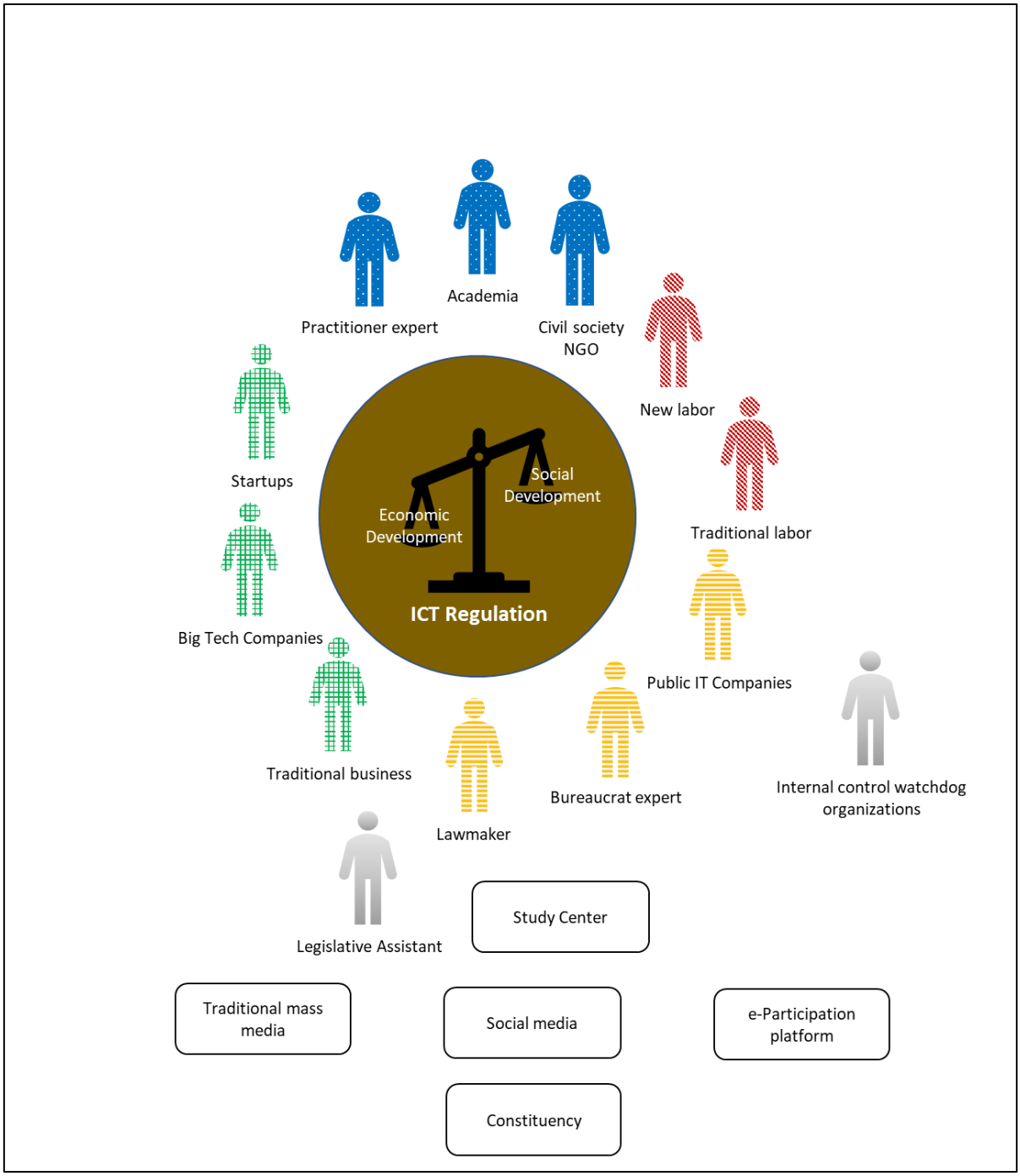
In the next section, we present the group of actors in the regulatory arena and the analysis results by administration level. We end up with the analysis under Habermas' System and Lifeworld framework and the Colonization signals.

4.4 Findings

4.4.1 Actors in the Regulatory Arena

We describe our findings about the actors in the political-technocrat regulatory arena of the researched case in Figure 4.3. It is a multistakeholder and multidisciplinary environment where some actors are expected to participate in policymaking and regulatory design discussions.

Figure 4.3 Actors in the political-technocrat regulatory arena



Source: by the author.

Lawmakers are the elected politicians nominated as members of the Committees by their political party, based on the agreed distribution of vacancies between parliamentary parties renewed yearly. They are rarely experts in the ICT theme. Otherwise, they guide their action toward accountability to their constituencies. In its primary sense, policy formulation belongs to them.

Bureaucrats are top-level technical experts from units within a ministry, municipal and state bodies, or a separate specialized agency, following the traditional institutional organization around sectors or activity-focused ministries and agencies. We also included Public Prosecutors in this group of bureaucrats due to their expertise in interpreting under the current legal framework, the new social and economic relations originated and supported by emerging ICT. Another set of ICT experts who participated in the meetings was the public IT companies' technical staff.

There are three groups of business representative actors. One concentrates on the traditional economy, usually represented by employers' unions or business sector associations. Big Tech Companies (e.g., Huawei, IBM, Intel, NEC) form another business group. The last one includes Startups and associations of ICT companies or emerging technologies sectors like cryptocurrency and blockchain.

Traditional syndicates dispute with new associations the laborers' or individual entrepreneurs' representation.

Researchers from Academia and Practitioners are other experts invited to contribute to the discussions as suggested by the committees' members. Sometimes, these actors mix their activities with civil society NGO activism.

In addition, some actors do not appear but exert influence in the discussions and decision-making of the regulators.

One crucial actor is the Legislative Assistant, distinguished between those who directly advise the parliamentarian in his/her office and assistants who work in specialized study centers and assist different parliamentarians upon request.

The assistants who work directly with the parliamentarian in the offices usually do not have the same level of expertise as those who work in specialized study centers and have to make do when the specialized advice of the house cannot meet demands on time.

> The technical assistants, and I can speak for both houses, the Chamber and the Senate; they are very professional. Sitting down and discussing with the technical advisor of the various committees is, without a doubt, always a lesson in knowledge, in the ability to discuss. (P04)

Those who work in specialized study centers are highly qualified. They have a very reserved behavior of technical acting on the subjects. The assistants of these specialized centers we invited to participate in the interviews refused because of secrecy and the need to maintain a position of political exemption.

> We are subject to specific rules different from the private sector. One of them is the legal concern regarding providing information that involves confidentiality aspects. On the other hand, as the Legislature encompasses the representation of different segments of society, there is an additional concern: the political use of information by one party, for example, against another. (Legislative Assistant, CCSP)

The assistants who work directly with the parliamentarian in the offices usually do not have the same level of expertise and have to make do when the specialized advice of the house cannot meet demand on time.

> We, in the offices, are very generalists. For example, I am from Accounting and Law. However, there are matters in the areas … They are different fields of knowledge. So, we use the Senate consultancy to guide ourselves when the matter leaves our domain. That is the problem. Sometimes the demands are very urgent, and they take more time because they serve the entire Senate. (A10)

In any case, they enjoy trust and access to parliamentarians. Due to the conflict in the agenda between several committees, these assistants participate in the meetings replacing in the parliamentarian's place, keeping him/her informed by mobile message of the progress of the discussions. In addition, they act as a filter against lobbyists. These cabinet assistants try to prepare themselves, clear up doubts with the exhibitors, and discuss the issues with the parliamentarians, but they understand that the final decision belongs to the parliamentarian who has the mandate.

> A10: If you were a lobbyist, not in the pejorative sense, […] Sometimes, to help the parliamentarian give the best vote and present the best amendment, we always have a more defensive posture. No opinion is given without first studying, debating, discussing with the parliamentarian, and seeing some biases. […] we look for it because these corporations significantly influence Congress.

Other actors that emerged with a less ostensible influence are the watchdog bodies, closely associated with the fear that innovation initiatives be interpreted as weakening the current bidding and contract rules aiming at facilitating the diversion of resources and money laundering due to the country's corruption history.

4.4.2 Administration Level

APPENDIX G illustrates the complexity and the risk of legislative power overlap between administration levels in Brazil related to some of the ICT issues.

4.4.2.1 Municipal Level

There were only two themes at the local level that sparked discussion: Food delivery platforms and Ride-hailing platforms. The first had been discussed since early 2019 but faced a Focusing Event in July when a motorcycle driver died during delivery service without assistance. The occurrence changed the path and the tone of the discussions.

Another concern was the Ride-hailing platforms' fiscal impact on the collection of State tax on vehicles and the amount shared with the municipalities. The impact would involve regional tax disputes, as the prominent car rental companies have their fleet registered in other states and rented in São Paulo by Ride-hailing platform drivers.

In some meetings and Public Hearings, invited experts and specialized bureaucrats contributed to sharing their knowledge. However, the main actors were business representatives, business and labor associations, or unions from new forms of work (private drivers) or traditional ones (taxi drivers).

It was noteworthy that there was no discussion about projects toward the Smart City theme. The inexistence of a specialized Committee on ICT may have contributed to this.

> I think it would be lacking today because we study so much on a topic. […] if a permanent committee is created […], these would be topics that they would start studying with frequency and, consequently, be able to have a more technical opinion of what is happening in the world of technology. (A11)

4.4.2.2 State Level

The main concern discussed in the legislative house Committee of the State level was that the State's education system, responsible for public high school and relevant participation in the third level of education, can develop the skills necessary to bridge the gap between what the educational system offers and the market needs.

We found that São Paulo Research Foundation (FAPESP) is essential in formulating policies and dialogue with the legislative and executive branches. The current relevance pointed out by the FAPESP expert to the AI theme, admitting that it was not foreseen in 2016 when the R&D Master Plan was updated, justified the initiative to create an Engineering Research Center in Artificial Intelligence in partnership with a private company and the University of São Paulo.

Another topic of interest raised by one of the Committee members, who seemed to play a Policy Entrepreneur role, concerns the incentive and support policy to develop local startups. A concern for a favorable business environment to mitigate the predatory attraction of talent by other countries.

An interesting point raised by this Committee member that involves this support policy for Startups concerns the contracting of an innovative solution by the Public Administration, whose rules are stringent and, in case of failure, could be interpreted by watchdog offices as a corruption risk. “Today, I think the fear of making mistakes has become more expensive than corruption.” (P01).

It drew attention that the Committee did not debate the use of facial recognition technologies and AI once the competence to provide public security belongs to the State and is a theme under question worldwide. The reason was that the member negotiated the themes at the beginning of the year, and “if I put a lot more things, maybe I would start to be alone here. It was complicated to convince everyone to be present” (P01). Therefore, it is not a priority theme yet and reveals a Strait Individual Awareness from the members.

4.4.2.3 Federal Level

At the federal level, we analyzed the records of a Senate Committee (SCF3) and two from the Chamber of Deputies, one specifically dealing with cryptocurrency (SCF2).

At the SCF3, we analyzed seven records of meetings, including three Public Hearings. One on cybersecurity, another technology applied in agriculture, and the last on Smart Cities. The first one was motivated by a Focusing event in which top officials and a judge had their Telegram messages hacked (Cimpanu & Mari, 2019). It raised discussions about sovereignty and jurisdiction involving enforcement of national rules (e.g., justice access to WhatsApp messages) and punishment.

One of the main problems discussed involved infrastructure, mainly antennas to enable IoT and autonomous systems in the Smart Cities' context and strategic national and business security, considering 5G technology's expected availability in the coming years.

Another problem was tax evasion or disputes due to a gap in legislation regarding new digital businesses (e.g., Uber, Airbnb, WhatsApp, and Skype) since legacy legislation, designed for traditional business, could not be easily shifted to this new reality creating asymmetry in the business environment.

Again, the meetings and Public Hearings received experts and business representatives. Nevertheless, the main actors were specialized bureaucrats from the executive branch.

We observed the same protagonist role of specialized bureaucrats from the Central Bank and the Security and Exchange Commission of Brazil (CVM) in the SCF2 meetings. This Special Committee that deals with virtual currencies was motivated by a Focusing Event referring to various financial Ponzi schemes in Brazil (Gusson, 2019). In ten meeting records analyzed, technical bureaucrats helped to show that the schemes had nothing to do with the technology itself. The main problem highlighted involves a grey regulatory area, depending on whether cryptocurrency is taken as a de facto currency, which is not the case in Brazil, or as an asset whose enforcement of rules belongs to the CVM.

The last Committee at the federal level was the most productive. The deputies have a legislative consultancy office with a technical staff that can help with science and technology issues.

There was a wide range of topics discussed at the meetings. The main ones were AI & Machine learning, Cybercrime, Face recognition & surveillance, Startups, and 5G technology.

The issues raised were the risk of bias, need for human supervision, high level of false positives, lack of unified personal public register, right to contest, technical difficulty in accessing financial and communication data from encrypted proprietary sources, fiscal restrictions on investments, a gap in legislation and the incapacity of legacy legislation to cover business based on new technologies, the regulatory asymmetry between traditional and new ways of doing business, tax evasion and disputes, the risk for jobs, human rights and citizenship.

Once more, the meetings had many contributions from bureaucrats, experts, and business representatives. However, this time, we highlight the participation of civil society

organizations. It was below the participation of business representatives and technocrats but higher than that of the other Committees.

A special warning from one of the invited civil society representatives concerns the easy way of public investment, despite the scarcity of resources, in solutions that will soon be obsolete or scrapped due to the high maintenance cost, ending up as "Technology White Elephants" (Representative of the Brazilian Forum on Public Security, Male, SCF1, Session Apr 3rd, 2019). The reason goes beyond the independence of the MSF streams. It reaches the rational inversion of a solution that must seek a problem.

4.4.3 Habermas' System through MSF

Analyzing Habermas' System domain through MSF's concepts was somewhat easy. The exploratory analysis of video records of the meetings and the interviews had strategic action passages that fit with one of the MSF's concepts, as described in the following subsections.

4.4.3.1 Ambiguity

There were no apparent signs of discussions around different alternative solutions. On the other hand, a general behavior at all levels of incessant search for more information, with the suggestion of specialists to be invited for future meetings. This behavior complies with the incremental path of law-making.

Another source of ambiguity was the search for international (New York, London, Paris, Berlin, San Francisco, California, Japan, Singapore, Dubai, England, United States, European Union) and national (Federal Revenue Service) benchmarks, in addition to technical visits to companies and manufacturers (Chainalysis, Huawei).

Two experts interviewed mentioned the lack of international uniformity that could offer a guideline for dealing with the new realities brought about by new technologies.

> There are thousands… millions of workers engaged in these platforms, and we do not have regulation. We do not have a guideline, for example, from the European Union. […] Each American state tries to make its law there, in their federalism. So we do not have a consensus yet in the world on this. (L06)

Due to the lack of guidance, national governments insist on “putting square pegs into round holes or vice versa […] trying to apply solutions developed in an era, to a reality, to a scenario that is now totally different” (E08).

Another source of ambiguity is associated with path dependence. The experience with laws and regulations quickly proved to be outdated, incapable of meeting the intended objectives, or whose side effects were not foreseen.

> For example, the intermediary liability regime of the Civil Landmark of Internet... two thousand and fourteen. It is seven years old. It was internationally hailed as a good design. It is in favor of freedom of expression. Seven years later, we are already starting to see a discussion about: is it ideal? Is the intermediary a mere intermediary? Or would algorithmic editing impose some sort of accountability on them? (E08)

The last source of ambiguity concerns the pervasive nature of digital technology nowadays. It does not fit with the experience of creating specialized regulatory agencies.

> When the agencies were created, we could very clearly put our finger on the areas, the borders, usually technological borders, where there was a need for this kind of decentralization and attribution of normative competencies to an independent entity. So, it was energy, oil, and telecommunications. Today, due to digital transformation, we see a phenomenon in which everything becomes the object of technology. (E08)

4.4.3.2 Time Constraints

Identifying the concept in the meetings' videos and interviews was easy. The main reason stated by the interviewees was the simultaneous participation in more than one Committee and the overlapping of agendas. “Few people know, but the committee meetings happen at the same time. They are simultaneous. Although I have participated as a member of more than one committee, you can only be present on one” (P02).

Besides, there is a perception that time today passes at an exponential speed, unlike in the past. “…. in the past, we had a singular progression. Time was linear. Today is an exponential thing. So two years, three years, today, means one hundred years in history”(L06).

This perception of the speed of time reflects the conflict between the traditional incrementalism of regulation and the strategy of dominating new unregulated markets.

> Things are being created, and no one knows how they will work. We cannot regulate something that we do not know how it works. It does not even make sense. Uber came out at two thousand fourteen. The first decree was in two thousand and sixteen. In other parts of the world, now that there is regulation. Why? Because we need some field research time to understand the impacts, how it works, and what is happening. We do not do it from today to tomorrow. (A11)

Therefore, the challenge is to reduce the time for monitoring, evaluating, and updating the regulation created.

> The big problem… is that we have an increasingly shorter time frame for evaluation, monitoring, and updating. I think all legislation today should already be born with monitoring forms and, mainly, how we do update it as an obligation. (E07)

4.4.3.3 Problematic Policy Preference

On the politicians' web pages and during the Committees' meetings, areas of preference for action are evident. Naturally, parliamentarians honor accountability to their particular electorate. "…someone who feels the need to be accountable, for example, to my voter and those who helped me" (P01).

Some main thematic groups of parliamentarians in the National Congress are the Agrobusiness, Evangelical, Business, and Public Security. Among those interviewed, we had one with an overarching entrepreneurial label, one environmental, one educational, one transport via apps, and one with a traditional business label who found in the Focus Event of the Ponzi scheme with crypto assets an opportunity to insert and develop a niche on the topic.

> If you watch this interview, do you have any complaints about a pyramid with crypto assets? Do you think our text of the presented project could be modified if you have any contributions? Could it be improved? It is time for you to send this modification, and we are here at your disposal to build the best text to make a libertarian regulation of growth that can be attractive to other countries, seeing Brazil as a place of investment and technology. (P03)

Apart from this case, the preference for problems related to emerging ICT still does not appear as an overarching label of parliamentarians whose mandates are still very much linked to the traditional economy. A recent exception was the election of the first representative in the City Council for a new app drivers niche. "…the final consideration is that the app drivers elected me can now count on a person thinking about self-employed workers through apps" (P09).

Despite the legitimacy of protecting his/her electorate, it creates difficulties for a more macro view of the problems and their impacts.

> So when you do something on a macro scale, you must see what is good in macro terms. So, I think this already creates a difficulty because each one is there trying to defend specific niches, and sometimes it makes it impossible for us even to have a better view of the whole. (A11)

4.4.3.4 Strait Individual Awareness

This MSF Framework concept was the most difficult to identify. Possible indicators of a lack of awareness of responsibility with the attributions of the Committee could be the absence of sessions or non-participation in debates in Public Hearings, as commented by one of the Senators during a session. “Many senators sat here. I will not say the name. My friends said: come on, I do not know anything about this subject. I am leaving” (Senator, Male, White, Right Wing, SCF3, Session Jun 26th, 2019).

However, we noticed in the interviews that this apparent lack of participation might be associated more with the lack of time.

Another confusion that makes classification difficult occurs with the concept of Problematic Policy Preference since the parliamentarian seeks to maximize the political return of his participation with his/her electorate.

> So, it is the lack of time, the connectivity of the topic with that person's mandate, because if he/she does not see any political gain, he/she will probably have less incentive to participate..., getting a quorum to materialize the entire formal environment is challenging. (P01)

This search for political return is manifested more clearly by the preference of parliamentarians to act in the two most important committees. The Constitution and Justice Committee assesses the constitutionality and legality of legislative proposals, and the Budget and Finance Committee assesses the budget and financial impact of the proposal. Almost all matters pass through the two committees, which offer more political power to parliamentarians.

> What usually ties someone there, for example, the Finance and Budget Committee and the Constitution and Justice Committee, are the entrance and exit doors. All projects must go through there. So, everyone is essential because they lock up the house if they stop. There is seldom a quorum problem. (P01)

4.4.3.5 Fluid Participation

The most significant turnover is in politicians due to elections every four years. In addition, there is an annual review of the composition of the committees based on the proportionality of party representation and political negotiations within the parties.

> Now, the parties must regroup this in the best possible way. Sometimes a party’s president chooses one or chooses the other. Then he says... ‘next time, it will be you. This legislature will be that one’. So, there is this political composition. (A11)

Specialists from the executive and the prosecution services have continuity, although they can be removed from top-level positions by the head of the executive branch or the prosecution services at any time. One way to ensure continuity would be through the participation of mid-level employees from various bodies. “One way to generate cooperation is precisely at the intermediate level. I would say at the level of department directors and secretaries” (E08).

This continuity contributes to executive, Public Prosecution, and legislative specialization. ”Of course, some councilors have been in the house for six terms, […]. He already has clairvoyance of what it is about, how it is about, what was discussed, and what was not” (A11).

4.4.3.6 Focusing event

Throughout the research, we observed three Focusing Events that could have accelerated the regulation process.

The first, at the municipal level, was the death of a delivery driver while providing service for an app platform. He suffered a stroke and the platform, when contacted by the customer trying to help him, “asked to lower the order so they would notify the next customers that they would not receive their products on time" (Figueiredo, 2019).

The second was a cryptocurrency Ponzi scheme (Kaaru, 2019) that drew the attention of parliamentarians to similar events taking place in other countries.

> I want to know if it is fake news or not what happened in Canada... ‘Cryptocurrency exchange owner dies. Customers lose millions’ What happened? ‘115 thousand people were left without access to 137 million invested in cryptocurrency exchanges’ [...] the loss occurred due to the death of the broker's founder, the only one with a password to access an extensive portfolio of clients. The case became news worldwide [...] So, it is not a safe system [...] If it happened in Canada, a highly developed country, very different from the one we live. (Senator, Male, White, Right Wing, SCF3, Session Jun 26th, 2019)

The third, also involving crypto assets, was the suspicion of payment to hackers who broke the confidentiality of Telegram messages between prosecutors and the judge of the Car-wash operation with bitcoins (Cimpanu & Mari, 2019).

> One of the main lines of investigation of the recent hacker attack that illegally violated the privacy of members of the Car-wash operation follows the trail of a deposit in bitcoins made for the benefit of a famous Russian hacker. (Senator, Male, White, Right Wing, SCF3, Session Jun 26th, 2019)

All these events mobilized parliamentarians in the Committees and resulted in the convening of companies and specialists in heated hearings. However, none of them made concrete progress towards regulation, serving more to explore the media exposure of the committee's work.

> And if the discussion gets too stuck in this scenario of kidnapping, equipment, ransom via crypto, or the Ponzi scheme, it can end up being very restrictive. So I think it is part of the discussion, but it should not be the focus. (E05)

On the other hand, political turmoil, for example, at the time of the President's impeachment, is pointed out by one of the executive's experts not as a trigger but as an obstacle to the ideal debate leading to the isolation of the legislature.

> I remember when we were discussing, for example, the personal data protection bill. There was an ongoing discussion in the legislature. Because of the impeachment process, the executive branch's government withdrew entirely from that debate. It is not good when the legislature alone has a critical agenda, and the executive has no idea what is happening. (E08)

4.4.4 Habermas' Lifeworld

Analyzing Habermas' Lifeworld domain was challenging. We needed a high level of abstraction and interpretation to identify values, attitudes, and beliefs in excerpts from members' speeches and invited experts in the videos and in the interviews that could be associated with concepts such as truth, sincerity, participation, language, dialogue, knowledge, and democracy.

We organized the coding results that we could associate with the main concepts applicable to the TCA's Lifeworld domain in the following subsections: Public Hearings; Traditional Mass Media versus Social Media; Validity of arguments; Values, attitudes, and beliefs.

4.4.4.1 Public Hearings as the Ideal Speech Situation

The legally constituted debate process in the Committees of all levels of administration satisfactorily met Habermas' Democratic Principle. Parliamentarians are free to propose Public Hearings and suggest guests. There was no evidence of any restriction on the participation of members or guests. The time for presentations and debates was limited but managed without bias.

All interviewees validated Public Hearings as a space for sharing knowledge and discussions to reach a consensus. Some of the guests interviewed expressed a preference for low-controversy Hearings. “I think this public hearing instrument in parliament is fundamental because it allows you to hear all sides. It is listening […]. It is not a clash” (E07).

Parliamentary assistants, otherwise, are rooting for more clashes. “And the Hearing is excellent […] because we get aspects that confront each other” (A10).

The analysis of the profile of the guests who participated in the Public Hearings (Table 4.8) reveals that, in general, there is a predominance in the participation of representatives of companies and business associations or unions (33%), followed by bureaucrats (30%), and academia representatives and professional experts (25%). Workers and their unions and civil society organizations had the lowest participation (12%). However, this profile is not homogeneous. It depends on the Committees’ legislative competence at each level of government and on the topics addressed. For example, the participation of workers' representation was concentrated in the Municipal Committee due to the theme of transport and delivery apps, while NGOs participated only in one of the Chamber's Committees.

For the politicians interviewed, the Public Hearings fulfill the role of publicizing the discussions and showing the participatory and democratic character of the construction of legislative proposals “with everyone sitting at the table” (P01). However, knowing that the “possible consensus” (L06) is an ideal difficult to achieve without qualifying the debate.

> That does not mean that the general society will agree with everything. Of course not. […] not all matters are consensual matters in society. Nevertheless, you cannot decide without a minimum consensus, a minimum understanding of the impacts of the transformations that each vote like this takes place. Some critical things are very poorly debated. (P02)

Public Hearings also serve as a demonstration of the parliamentarian's performance for his/her electorate. They know they are being filmed, so they also address voters who will watch the sessions' videos. While exploring the video sessions, we had this perception in which members often looked at the camera, acting in a pre-programmed artificial way.

The experts invited to participate in the hearings prepare to provide clarifications but are aware that questions are often asked not to clarify a doubt but to mark a political or interest group position.

> I used to joke with my friends that I prepare myself as if I were on a doctoral session, to have all the information at hand, documents, and not to fail to answer any questions. Over time, I have also realized that the dynamics of public hearings have a political component that is perhaps more important than the technical component. I go as a specialist, a technician on the

> subject. Otherwise, the parliamentarian who convenes the public hearing, or those who are there to ask questions, are not always looking for technical clarifications. Political demands, pressure from interest groups, or certain perceptions about the issues often drive them, in addition to a dynamic of opposition versus situation. (E08)

The experts leverage the potential of recorded hearings hoping to reach and enlighten the public.

> These hearings seem to be a significant opportunity to clarify the motivation behind public policies and provide more objective data. I often feel talking not only with the parliamentarian there but with the broader public who is watching, who will see it on TV Chamber, TV Senate, bringing a little credibility, explaining why the executive branch is going in one direction or another. (E08)

However, one deputy interviewed pointed out that this reach does not transform into the necessary active participation.

> Today, there are tools that any Brazilian can access TV Chamber, Radio Chamber, the websites of the Chamber, Senate, and Congress, and follow the debates of the articles. In the end, those who end up voting are the deputies. So, if they do not listen to society, if they don't... we need more active participation, not just passive participation. (P02)

One positive point about the Public Hearings was the participation of citizens through e-Participation platforms. Some of the questions presented were read and answered during the meetings. We examined these contributions via the e-Participation platform and noticed few participants, apparently from groups with a certain cohesion on the issues.

In addition to the digital divide problem, society's lack of participation in organized debates on public policies is not an exclusive feature of topics related to emerging ICT.

> I think the digital divide accentuates the existing situation because not everyone affected by a phenomenon will naturally participate in constructing solutions. Some will naturally be spectators, and others will be actors, which was already true in the pre-digital world. (E08)

4.4.4.2 Traditional Mass media versus Social Media

Traditional media remains essential to capturing, filtering, and communicating with the political class. Politicians continue to pay attention to the traditional mass media news to direct their performance in committees, especially the older ones. Nevertheless, it is easy to see in the videos that cell phones and social media have gained space as a direct communication channel between parliamentarians and their electorate.

> Look, the senator, [...] he is very close to his social media. It is not that he does not see the open media. However, he is marked out a lot by his electorate, by what arrives on his cell phone. […]

> Other parliamentarians do not have this role linked to social media. Old-fashioned parliamentarians use the more traditional media to guide their actions. (A10)

Moreover, the boundaries between traditional media and social media are increasingly blurred. “I think that traditional media continue to play a crucial role. [...] It continues to be relevant, but it starts to share space with other instruments, and we see a fading boundary between them” (E08).

However, direct contact does not necessarily imply better communication. On the contrary, disseminating fake news harms the quality of debates.

> So, sometimes you have great difficulty having a quality debate. You already have the information channel. People can access parliamentarians, but I think there is a lack of quality in the information […]. Nowadays, the population often looks for parliamentarians to confirm or not fake news. It is a severe problem that we have today […] that greatly undermines the debate. (P02)

Part of the parliamentarian and his/her assistants' job is to check the veracity of the news, trying to convince his/her electorate that the information is false.

> Not everything we receive from social media is true. So, we check if it is a very strange or abnormal topic. The communication team responds to everything, to everyone. [...] And if it is a relevant topic, he (the parliamentary) makes a video about it, […] showing the truth. (A11)

The big digital platforms and their algorithms for targeting and propagating content are pointed to as one of the disinformation causes.

> This issue of surveillance capitalism, of big platforms for cultural distribution, for political production, is a problem recently identified. […]. The whole issue of this algorithmic society is that we have informational mechanisms and algorithmic decisions that profoundly limit how much a message can be disseminated or how third parties receive it. (E08)

One of the parliamentarians highlighted the importance of the emergence and multiplication of agencies or observatories specialized in checking the veracity of information to face the problem and guarantee a safer environment for discussion.

> Today, we need agencies that can say... look, this is valid information, it is consistent, this is not. So, this type of observatory or information validation agency is growing increasingly worldwide, so people have access to secure information. (P02)

Another solution to the problem of misinformation pointed out by the same parliamentarian is the emergence of specific content channels for each area, produced on video, that translate specialized scientific knowledge for the ordinary citizen.

> Specific communication channels for each area. Today we have professionals in the science area who are dedicated to communication and sharing information about certain content. We

> have professionals from certain areas speaking and translating scientific knowledge to mass knowledge. (P02)

Interestingly, the recent election of one of the parliamentarians interviewed is related to this digital influencer activity.

> I know it is complicated to be an app driver... to learn. […] You must understand how to use apps and how they work […]. So I created a YouTube channel to start talking and explaining, helping people who wanted to be app drivers. The YouTube channel grew. (P09)

4.4.4.3 Validity of arguments

Participating guests in Public Hearings help to create a shared meaning of concepts, terms, and expressions. When there is polarization between participants, such as between employers and employees, traditional workers and self-employed workers, and traditional companies and Startups, this mutual understanding is more complicated. Parliamentarians seemed more comfortable and satisfied when experts from the executive branch, prosecution office, academia, and practitioners participated. “We received several specialists here. We asked the universities, the secretariat staff, and people connected to the private sector” (P01).

The experts were careful with the language, knowing that the audience of the Public Hearings mostly did not have enough technical knowledge.

> Finally, understanding that it is a very relevant audience but not a technical one, it is also necessary to calibrate the language so that people can make themselves understood. Because it is useless to reach a heterogeneous public, which sometimes will have a specialist parliamentarian, but often there will not be this specialist and bring an incomprehensible language. The idea is to start some dialogue and bring some kind of clarification. The language cannot be excessively hermetic. (E08)

Sincerity was undoubtedly the most challenging assumption to assess as it is more susceptible to hidden strategies. It is an inherent characteristic of the political environment that experts and parliamentary assistants recognize.

> Sometimes, a parliamentarian comes with his content. Sometimes, his understanding differs slightly from ours. He chooses. […] He has the mandate. We are technicians. We try to offer the best path, the path within technicality. Now, we know that ?(within)? technicality has politics. Politics? We get out of the political sphere. (A10)

We were only confident in recognizing the assumption when interviewees or participants in Public Hearings admitted that they did not know or did not have a solution to a problem or recognized the possibility of being wrong and ready to change their opinion.

> I do not know, I do not know where we want to go. I do not know what the state of São Paulo's goal is for two thousand and fifty. How do we create these bridges between each actor? I honestly do not know the answer. I would love to find out within this first mandate. (P01)
> Look, nobody owns the truth. We are trying to contribute with ideas that may be completely wrong. They are just initial impressions that we have. (L06)

However, this ideal speech condition is currently lacking in the country.

> Actually, I see these forums as forums for debate, dialogue, presenting ideas, and listening too. [...] So, dialogue is lacking in the country. The person presents himself with an open heart, presenting his ideas with the ability to listen to the other and always with the thought that we can be wrong and change opinion. Acceptance of another argument is inherent in the debate, never disqualifying the interlocutor [...] And there is no easy consensus in this discussion. These are possible consensuses. (L06)

The assumption of rightness is associated with curating the information carried out by the parliamentary assistance discussed in the previous subsection.

> In a project that the senator presented on artificial intelligence, there was an aspect that some technicians said that supervision in an IT area is unfeasible. I did not quite understand why. Then the guy convinced me outside the public hearing. (A10)

One aspect highlighted by one of the interviewed executive specialists that we understand the TCA's ideal speech situation does not cover is the feeling of belonging to the final product of the discussions.

> I think all these processes have in common the perception that the need and engagement of various actors do not stem only from the fact that it is a good practice to listen to everyone but because if […] the final public policy is not accepted, is not effective, because there is a feeling of estrangement on the part of the other actors. 'Ah... I did not participate in this. I do not commit to this document. I will ignore it, or I will even actively boycott it.' (E08)

4.4.4.4 Values, attitudes, and beliefs

Table 4.12 presents the principal codes representing beliefs, including values and attitudes related to personal knowledge about the subject, experiences, opinions, habits, and other perceptions that portray the interviewee's worldview.

We grouped the codes into three themes that are not mutually exclusive.

Table 4.12 Codes associated with themes representing Values, Necessity, and Concern

Theme	Code	Excerpt
Value	Anticipate no	E07: Every time the regulation tries to get ahead, it creates difficulty and makes implementation difficult.
	Challenge	E08: It is very challenging and exciting, but it is also a privilege for us to live in this moment. Fifteen years from now, when everything is better organized, people will look back... "wow, the people who were there at the beginning of the conformation of this new communications scenario...."
	Culture	P01: Perhaps these are the main regulatory challenges and more legal certainty for private funding for research in universities. Part of it is legal certainty, but much more a cultural change, not so much regulatory.
	Formal education	P04: I had enormous personal difficulty returning to the university in entering the university campus. I think it was a moment of personal overcoming and automatically opening up the range of knowledge to make me be able to make decisions even better.
	Government obstacle/inefficient	A11: Those who like the technology area are not in public administration. They even have preconceptions. Hate it.
	Incremental progression	P02: it is not possible to decide without a minimum of consensus, a minimum of understanding of the impacts of the transformations that each vote like this takes place
	Liberal	P01: If we look at it, there is no study behind it. It is desperate because legislators, on average, disrespect a lot of those leaving their comfort zone, that will invest their money, will invest all their capital, and will invest their time to try to create a solution that can generate employment.
	Neutrality	P09: I want to make this line very clear so that people... so that professionals have a better quality of life, can work more independently, and apps can also earn more. I think my job is always a win-win.
	Regulation is possible	E08: The difficulty is that we do not even fall into the temptation of thinking that the internet is an unregulated space, not subject to regulation, or should not be.
	Unpretentious/Humility	A11: One of the things I changed my mind in the middle of the process was about the regulation... it is cool because I also allow myself to change my mind.
	Waste of time/disbelief	E05: Maybe this discussion on a more open model, a public network, or other crypto assets gets lost in the time it takes for a bill to be discussed and appreciated in the House and Senate and be approved. We may end up missing these questions.
Need	Adherence to society	P02: Society cannot think one way, and the Legislative Houses think another way. So, this dissonance that sometimes exists in some issues can be reduced significantly with these debates.
	Diversity	E07: The issue of diversity is not about gender only, but it is diversity in the broadest sense. People are different. Territories are different. So, the fullness of diversity needs to be respected. Because regulation is a standard, and sometimes the pattern is dumb. So, we have to perceive how this affects the different actors in the ecosystem.

Theme	Code	Excerpt
Need	Education	P04: We will not be able to advance in efficacy and effectiveness if we do not prepare citizens. It starts by preparing the education professional, whether from the higher education, postgraduate, high school, or elementary school, and begins in kindergarten.
	Government protagonist	E08: I often noticed that whoever was in the area, inside the government, had a perhaps more accurate perception of the existing problems than an external consultancy. Of course, it also adds value, but I do not see the possibility of replacing the analysis of those in the public sector with a consulting study.
	Human dignity	L06: But the legislature has the democratic legitimacy to understand it differently, consider it a special relationship, and establish the rules, observing the minimum levels of civility, the minimum levels of dignity.
	Long term planning	P01: Because what I miss as a politician, as a deputy, as someone who feels the need to be accountable, what is our plan for two thousand and forty, two thousand and fifty? Where do we want to go?
	Nationalism	E07: We must commit to the citizen, a commitment to society, a commitment to territory, a commitment to the nation.
	Participation	P02: But in the end, those who vote are the deputies. So, if they do not listen to society, if they don't... we need more active participation, not just passive participation.
	Social protection	A11: I think that a universal basic income should already be considered. I understand the problems with this income because what is essential in one place is not in another, but people will need to be prepared to either change jobs or adapt.
	Transparency	P02: So, it is crucial that society can follow. Today there are tools. Any Brazilian can access the TV Chamber, Radio Chamber, and the Chamber, Senate, and Congress websites and follow the debates.
Concern	Asymmetry	E08: It is a dispute, shall we say, illegitimate because some are subject to the entire regulatory framework, others are not.
	Business environment	P01: Then, there is our tax system too, which is an insane asylum. Nowadays, with the ease of setting up headquarters abroad, we see several startups setting up headquarters abroad, providing services here. We are scaring away the best we can have.
	Delay of legislation	E08: Today, due to digital transformation, we see a phenomenon in which everything becomes the object of technology. All sectors of the economy, society, and the public sector are now impacted by these technological phenomena that generate a brutal change in the speed at which things happen and quickly create this lag in legislation approved by the National Congress.
	Digital divide	E08: My grandmother lives in the countryside. Besides the generational matter, there is no telephone there. I think about the children who are growing up there. They are outside the digital world, in which connectivity is a prerequisite.
	Justice divide	P09: The regular driver does not have easy access to the legal system and the apps… they ‘samba on’ (take advantage). They do wrong things. The driver does not know how to complain.
	Outdated legal institutes	E08: We have our constitution, our fundamental document, and a series of mechanisms to protect certain legal assets which no longer make sense. How will we restrict foreign capital on the internet if we can access the content from anywhere? Does that make sense? Does it make sense to talk about content quota? Does it make sense to speak about granting so one can provide a service?

Theme	Code	Excerpt
Concern	Punitive bias	P01: The government is not innovative. It has all the incentives to keep making a badge and making that ((hand gesture in parallel, limiting the view)). Any action outside that it tries to innovate to reduce expenses or invest in something to make its work more efficient, if it makes a mistake, it can be punished.
	Results/Impacts	L06: These critical workers' associations have a political factor, a power struggle. So, often, the legal, technical argument is a little left aside because a partial entity defends it, that has an underlying interest, an interest behind it, which is: 'look, I cannot... the legal thesis, abstract, it does not work for me, I need a result.'
	Safety	Senator, Male, White, Right Wing, SCF3, Session Jun 26th, 2019: My concern is protection. It is so much that my question to natália is about safety. My question to you is about security. All the questions I am going to ask are about protection
	Society is ready	P04: It is no use having a whole line of technologies available to the citizen to the public administration if we do not have the citizen prepared for this situation and the municipal administration ready to respond to this citizen's difficulty.
	Universality of benefits	P04: To serve the citizen within a state whose contact difficulty is much broader than in the region where we live. So, this discussion comes up a lot at this moment of the pandemic and the debate on 5G.

Source: by the author.

The first theme, “Value”, represents beliefs in passages in which the interviewees expressed importance or unimportance, a preference, or highlighted a difficulty related to problems. “Need” was a theme that sought to identify attitudes or values highlighted as necessary to solve problems. The last theme, “Concern”, identified passages in which the interviewees expressed concern. Therefore, the organization allows visualizing values considered important, what would be necessary to solve problems, and the underlying concern, without worrying about picturing the relationship between the codes in each theme.

Furthermore, these beliefs portrayed are individual, meaning an identification step that precedes sharing knowledge and an accepted worldview to reach a possible consensus.

4.4.5 System Colonization of Lifeworld

The signs of attempted instrumentalization of Lifeworld analyzed in the research are restricted to parliamentarians, their assistants, and specialists from the executive and prosecution service.

One of the parliamentarians’ strategies is to encourage the organization of interest groups and civil society in associations to unify the discourse and facilitate communication with parliamentarians. “We asked them to create an association to improve the dialogue with Congress. From the Association, have a single speech. […]. Because each one came and spoke differently, taking care of his/her backyard” (P03).

The executive's specialists prepare for the hearing to try to remove any negative bias resulting from Focusing Events based on a more macro technical analysis, highlighting the positive potential of new technologies without “wanting to be a seller of proposals” (E07). “

> The first time we started talking about it, we still had this issue of talking about Bitcoin, cryptocurrency. Therefore, we did not want to go that way because we saw it as an infrastructure, a possible use where SERPRO operated a government network. So, from two thousand and fifteen, we always tried to show that the market separated the cryptocurrency and the DLT blockchains. So, in the presentations, we always tried to demonstrate that the blockchain ecosystem went far beyond cryptocurrencies. (E05)

Part of this strategy to prepare for the hearings is to meet the parliamentarian who proposed and try to map out the doubts and possible motivations.

> What I liked to do when I was in ministries that had parliamentary advice, I asked for that “face meter”, that document in which you have a photo of each of the parliamentarians who are members of the committee, the party to which they are associated. Whenever possible, I tried to understand who had called that public hearing and their motivations. (E08)

All Executive specialists defended a regulation format that starts with elaborating a base document by the technical staff of the ministry's office or a contracted consultancy to raise international benchmarks and listen to all actors in the ecosystem.

> This, for me, is the best model. We have a body of technicians who prepare the document by listening to the actors in the ecosystem. Often we do not have the resources for it. We do not have the time for it. However, for me, if you ask what the best way is, that is it. We gather someone who will listen and build a document to submit to public consultation. (E07)

This practice of drawing up a draft regulation can also be born in parliamentarians' offices. The perception of the same expert was not so favorable in these cases.

> The Legislature, depending on the legislator, depending on the theme, have forms of collective construction. […] However, the vast majority are born in offices. Someone enlightened goes there, makes a proposal, and then we have to make successive approximations because it is very complex. (E07)

Another way to produce a base document would be through inter-ministerial working groups, including several ministries, public bodies, specialists, and the private sector. The benefit is to offer everyone a belonging sense to the process helping to achieve the norm legitimacy. However, it is a much more cumbersome format.

> E08: Also, we set up inter-ministerial working groups involving more than ten ministries, more than forty public bodies participating, expert consultation, public consultation, workshops, and seminars. In short, a hell of work to reach a document that could be recognized as legitimate by all actors.

This base document is then placed for public consultation on a web platform to receive criticism and suggestions from any interested parties, be it an individual, a company, a business or labor association, or any civil society organization. There are centralized public consultation platforms at the federal (Brasil Presidência da República, 2022) and municipal (Cidade de São Paulo, 2022) levels. At the state level, consultations are decentralized to each secretariat or agency. “So, to have what? ‘Judas’, the draft text we put on public consultation” (E07).

A last relevant colonization strategy is the construction of principled legal frameworks. It means laws with basic principles and guidelines, leaving the executive branch with the duty to regulate through infra-legal, faster, and more flexible instruments. For the specialist, this is essential for technology-related topics.

> I understand that the law better handles some issues. Certain obligations can only be imposed by law, through democratic legitimation, by elected parliamentarians, and by the people. However, there are specific issues, especially topics strongly linked to technology, with a proper dynamism, including information asymmetry and a breakneck transformation speed, which are better dealt with through infra-legal instruments, which are also more easily updated. It seems

> that this design of having the law with general parameters and principles and then having the infra-legal instrument that will specify and operationalize that vision that the legislator has printed is the best way. (E08)

The following section presents the critical analysis of the findings of the general difficulties of the political environment, those related to emerging ICT, and Lifeworld colonization.

4.5 Discussion

There is vast and consistent literature in the area concerned with the social and economic outcomes of emergent ICT. It contributes to developing technical norms, standards of good practices for ethical development and use, and public policies for digital inclusion. However, formal legal or regulatory treatment is traditionally not attractive to the IS area, whose essence is to overcome the challenges of breaking boundaries, trying out new techniques, and innovating.

The literature review showed the scarcity of works that tried to bring the IS area closer to the legal area. Therefore, this is the gap that our study aimed to fill through empirical research that used interviews with the protagonists in the regulation process as the primary data source. Politicians, parliamentary assistants, and experts from the executive branch or prosecution service who participated in discussions and Public Hearings in the specialized Science and Technology Committees, in 2019, at the three levels of public administration in Brazil (Federal, State, and Municipal), which video records and documents we explored previously.

Studies such as those by Schlagwein et al. (2019) and Stahl et al. (2012) contributed to the choice of Habermas' Theory of Communicative Action as a theoretical framework for the study.

In times when the truth of information has become a value so questioned or even subverted in digital universes of parallel reality, the option for a theory based on idealized conditions of speech, in which arguments could be validated as to truth and sincerity in such a way that consensus is reached without falsehoods or errors, is paradoxical. It is even more questionable when the norm to be validated involves ICT, whose consequences and side

effects are difficult to predict and will directly or indirectly affect the whole of society in different ways.

However, the power of the theory lies in its deontological perspective. Habermas' Lifeworld is a model that we compare to reality to realize how far we are from this rational ideal of society and try to understand why.

We did not observe the Ideal Speech Situation or the Democratic Principle fully attended in practice. However, we agree with Schlagwein et al. (2019) that the framework provides a helpful guideline for recognizing the difficulties, their effects, and remedies or possible solutions.

Before presenting the critical analysis of the results, it is necessary to understand how the ideal of emancipation of society is expressed in a peripheral country like Brazil. The perception of the rights to protection of personal data, access to the internet, and non-algorithmic discrimination, for example, of an American or European citizen, is not the same as that of a Brazilian, Latin American, Chinese, Indian, or African. They exist but are overshadowed by fundamental human rights to food, education, health, employment, access to public information, access to justice, and the protection of life itself. Faced with the imbalance of realities, it does not seem reasonable to expect the regulation of emerging technologies to follow the same standards. For developing countries, adhering to normative standards promoted by multilateral organizations may mean maintaining a subordinate position in technological, economic, and social development, perpetuating development segregation between the North and South. Therefore, the emancipation of society in this study takes an approach that goes beyond the ideal of the ethical development and use of emerging ICT respecting principles of human dignity.

Bringing the case of Brazil to study the research question means bringing a continental country with a civil law system divided into States and Municipalities. It is politically and administratively similar to the United States, but the State and Municipal levels of government have less power to regulate, limited to the activities within their competence provided for in the Constitution. The State of São Paulo, chosen for the study, had, until 2020, a higher GDP than European countries such as Poland, Sweden, and Belgium. São Paulo is the most populous city in Brazil, the American continent, and the entire southern hemisphere. Therefore, the choices for the study have economic and social relevance and can be replicable and comparable with other countries, states, or municipalities.

Brazil has a positive track record of legislation related to ICT, recognized internationally, such as the Civil Rights Framework for the Internet Act 2014. However, what makes the Brazilian case more attractive for the study of the problem is the recent past of prominent cases of corruption in public contracts, the troubled political environment in recent years with the impeachment process, and the intensification of polarization in society with a right-wing wave.

The country's history of corruption and impunity for white-collar crimes raises the risk of regulatory capture by politicians sponsored by interest groups, organized crime, or led by Big Tech companies. This corruption risk inhibits governments' potential to promote innovative solutions that evade rigid bidding rules. Public managers fear that the watchdog bodies likely interpret the failure cases as corruption suspects. The worst is that it does not prevent governments from adopting solutions prematurely without an understanding and national pact on the costs and side effects.

4.5.1 General difficulties of the political environment

Most of the difficulties identified are neither new nor exclusive to the regulation of emerging technologies. For example, the fiscal war between States and Municipalities to host companies is not new; the simultaneity of committee meetings; the need to be accountable to the electorate; the electoral return as the variable to be maximized; and the prevalence of political and interest groups issues.

In the case of politicians, Fluid Participation is inevitable and is related to elections and disputes within parties for participation in committees. On the other hand, the turnover of specialists from the executive and public prosecution service can be remedied by more involvement in discussions at intermediate levels of administration.

Another difficulty of general nature is the competition with other committees, especially the most targeted ones, related to evaluating the constitutionality of the themes and the financial and budgetary impact. It is the type of competition that harms committees specialized in discussing specific topics, such as science and technology, but stems from the regulation of the houses and the legitimate search for space in these forums. Almost all subjects go through these committees that attract due to the exposure and power they offer to parliamentarians.

The same exhibition ends up attracting the creation of temporary committees to address issues resulting from Focusing events. Those observed in the research did not open a Policy Window. They only served to broaden the audience of the committees' work and to expose the participation of parliamentarians.

Public Hearings help parliamentarians learn and form opinions, especially their direct assistants. There is a tendency for Public Hearings to serve as an instrument for the typical incrementalism of regulation. Hearings are repeated, bringing different speakers and with few clashes of ideas. There is limited popular participation through the e-participation platform, which is not exclusive to the regulation of emerging ICT. The representation of society through civil society organizations specialized in ICT discussions is still incipient. Although communication channels for popular participation are available, they are not enough to prove the reach to all those potentially affected. Even if possible, it would be ineffective in case too many people participate in an unorganized way.

Discussions about emerging technologies do not suffer so much from the polarization that the country is experiencing. However, the public security parliamentary group tends to be more permissive about using cameras with facial recognition, for example, while demanding stricter regulation for crypto assets.

An exception in terms of polarization was the municipality concerning the theme of transport and delivery application platforms, which experienced significant participation from the various actors.

It was strongly fueled by the dispute over union power and economic groups, opposing the traditional regulated economy to the economy created from new digital business models with the characteristic of rapid massification. In situations like this, where the power struggle prevails, the validity of the arguments is not even examined. Therefore, the consensuses are not based on shared understandings but are arbitrated by the regulators.

While politicians use Public Hearings to take advantage of the exposure for their electorate, experts also take advantage, hoping to communicate through videos of the Hearings with a wider lay audience. Although the attempt is valid, it is still content of a limited range. It does not replace mass dissemination and clarification campaigns.

Even if the videos reach the desired audience, access to information does not necessarily transform into active participation in the discussion process. Most of the population does not actively participate in public debates by choice, regardless of the topic. That is why Habermas

stated that those potentially affected by a norm could question its validity as long as they participate in the discussions when defining the Discourse Principle.

One condition added to Habermas' idealized framework was the one pointed out by one of the executive specialists. The condition is that dialogue is not enough if all parties do not have the feeling of belonging to the discussion and of authorship of the final product. Without this condition, achieving the ideal of mutual understanding and knowledge sharing is impossible.

4.5.2 Difficulties related to emerging ICT

Some difficulties gain their own dimension because they involve emerging ICT discussions. It is the case of the multistakeholder and multidisciplinary political decision-making scenario, the strait institutional awareness, the time constraints taking the speed of evolution, and, of course, the noise in communication due to fake news disseminated on social media.

The multistakeholder scenario gains groups of workers, entrepreneurs, startups, and investors acting in new business models mediated by digital platforms, competing with traditional and regulated business forms, or related to services created from the use of new technologies (e.g., drones). These groups do not have representatives and are little known by parliamentarians.

It is natural that in a country like Brazil, where a considerable contingent of the population, and therefore of the electorate, still suffers from basic needs, parliamentarians do not take as Problematic Policy Preference issues related to emerging ICT. Exceptions were rare. It does not mean that there are no parliamentarians attentive to the issues. Nevertheless, most have not yet woken up or do not understand which political movement will be electorally beneficial. They are still disconnected from these actors who naturally tend to gain seats in legislative houses, as has already happened in São Paulo city.

These new groups of actors and business models introduce difficulties, with repercussions mainly at the municipal administration level, related to the asymmetry of regulatory treatment in the same economic sector, opposing digital and traditional business forms. In addition, there is more difficulty in the face of these new realities in dimensioning

the implications for tax collection and, consequently, on the budget and financing capacity of governments.

The multidisciplinary scenario gains a much broader dimension due to the pervasiveness of ICT technologies today. As technology is in everything, all areas of knowledge and sectors of the economy or society are directly or indirectly affected, whether or not they are included in a given public policy project.

Pervasiveness is also opposed to the tradition of regulation through specialized agencies, but that needs to be faced as personal data protection was. It seems to make sense for this type of analysis and transversal support to be incorporated into the attributions of the Agency created to regulate and supervise the protection of personal data.

Strait awareness that attracted the most attention was not individual but institutional. It was surprising that the topic of using cameras for facial recognition was not discussed in the State Committee, the lack of a specific Science and Technology Committee in the municipality, and the lack of debates related to the Smart City and IoT themes, considering the economic dimension and population of the two entities.

Another predictable difficulty with a disruptive regulation dimension is the speed of development, maturation, and scale gain of consumers or users of digital solutions. It is disruptive because it confronts traditional regulatory incrementalism and challenges the democratic principle of discussion to reach the best consensual decision. The strategy of designing businesses that are situated in regulatory vacuums, or gray areas, will hardly be avoided. New businesses will emerge based on new technologies and can quickly gain scale of use. It means for the parliamentarian that the population approves and wants to keep it. Hence, it becomes more advantageous for the parliamentarian to sponsor these new businesses' interests. Once these new unregulated markets are dominated by business models with a discriminating atomized price model (Lynn, 2020), the regulation is onerous and tends to accommodate the reality formally.

The international uniformity pointed out by the experts interviewed would help deal with the new realities arising from new technologies but need to be credible and universal. Therefore, it shall apply to the Big Tech companies, war industries, research institutes, and all countries' governments. The tricky thing is to ensure that commitments in this regard are accomplished.

The difficulty of disinformation could be among the general difficulties of the political environment, but as massification occurs through social media platforms, it is inevitable to include the difficulty among those related to emerging ICTs.

The ideal imagined by cyber-libertarians, who saw the internet as the perfect Habermasian Public Sphere of freedom and discussions of ideas, was not confirmed. The disinformation only increases the difficulties inherent to discussing topics involving technologies whose development and use are at the frontier of knowledge, and that translation for a non-specialized audience is a great challenge.

The solutions proposed to deal with fake news through observatories and specialized content channels are appealing and should be encouraged. Nevertheless, they do not prevent opposing channels that distort or falsify information from existing or that observatories have the same bias. It would lead us into the same trap of current polarization and misinformation and the same dilemma between defending the right to freedom of expression or the right to access trustworthy and complete information. In Brazil, the latter has proved to be more vital.

4.5.3 The colonization or how to overcome the difficulties

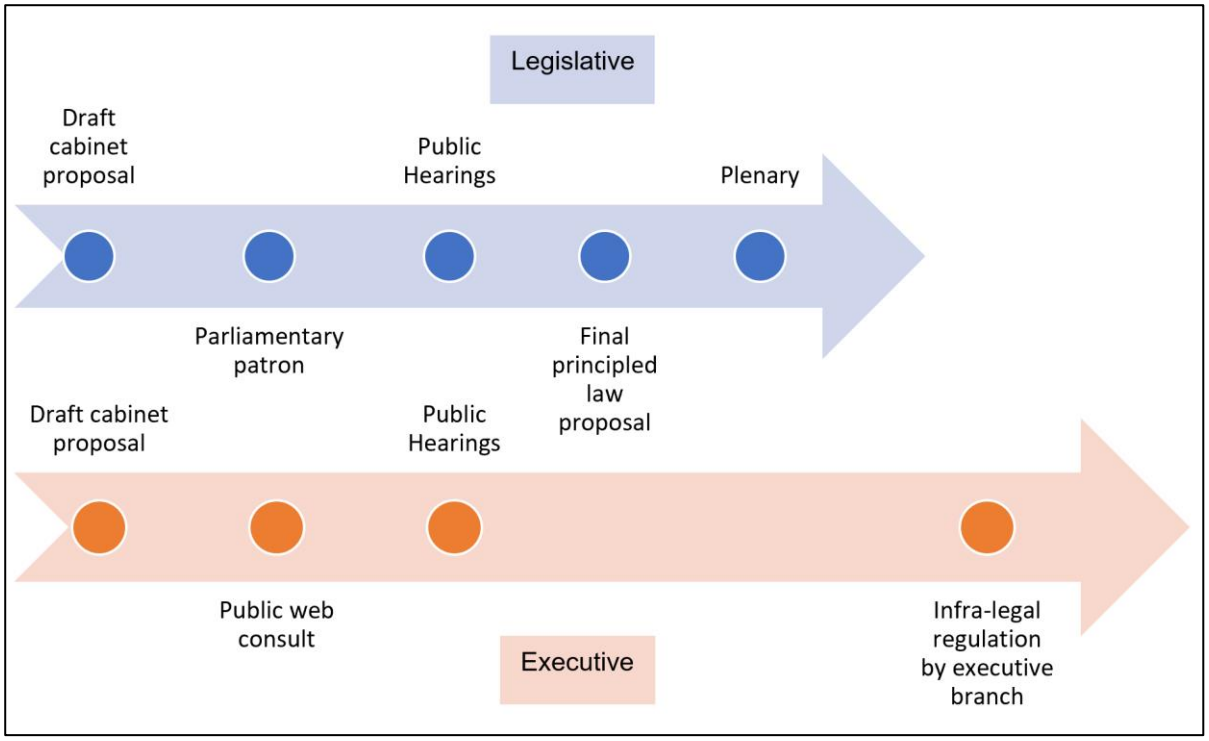
Some strategies identified are rational ways to influence the Lifeworld domain, but they are not harmful. For example, encouraging the organization of interest groups to unify discourse and improve communication is positive and necessary. In the same way, the preparation of specialists for the Hearings, seeking to know the parliamentarian well and trying to predict the questions and motivations behind, or seeking to emphasize in the presentation aspects of technology that explore more the potentially positive side to balance the negative bias that some Focusing Event may have caused or the other way around, are favorable.

Specialists in the executive, public prosecution, and parliamentary assistance services do not have the same degree of precariousness as the parliamentarians. Therefore, they are more capable of debate and more often use communication strategies to share knowledge.

All interviewees praised the importance of dialogue with multiple actors. Nevertheless, the specialists from the executive branch preferred organizing the discussions based on an initial proposal built in a cabinet, which is then offered for public consultation on the web. The Public Consultation results in a document of principled rules that attract the political class.

One parliamentary takes advantage of the emerging theme to try to take the lead, seeking to exploit it to maximize the benefit of the exhibition, mainly through Public Hearings. The debated proposal is forwarded, together with the Committee's report, for voting at the Plenary. Once approved, it is forwarded to the President of the Republic, who can veto entire articles. The President's vetoes are examined in Congress, which can overturn them. After the enactment, the regulation process continues in the executive through infra-legal acts. Figure 4.4 presents the ideal flow advocated by the executive specialists.

Figure 4.4 Ideal steps in the ICT regulation process



Source: by the author.

At all stages, there is the possibility of interest groups' action. It takes place somewhat transparently in Public Consultations and Public Hearings. However, there is a risk of fulfilling a mere protocol role of transparency and dialogue with society. In the other stages, the action covertly takes place. The steps in which this influence can have more effective impacts on public policy are in elaborating the initial document in the cabinet and the infra-legal regulation.

In the first case, the role of parliamentary assistants in cabinets or specialized study centers is strategic for collecting, filtering, understanding, validating, and transmitting information. The dependence of parliamentarians and the trust they place on issues

concerning emerging ICT makes assistants a strategic gateway for interest groups to act. In the case of infra-legal regulation, it is the specialists at the executive's intermediate level.

Finally, the preference for principled regulations favors the accommodation of different interests through infra-legal administrative regulations and interpretations independent of parliament. If, on the one hand, this option offers flexibility for adjustments and ease of updating, it brings to the focus judges and prosecutors who will have to interpret these principles in concrete cases without any guarantee of uniformity. A role that has already attracted the attention of international organizations (UNESCO & The Future Society, 2022).

In the next section, we present the implications, limitations, and suggestions for future research.

4.6 Conclusion

This empirical research took advantage of an intense legislative debate involving emerging technologies to help understand the regulation process, identify the difficulties, and obtain preliminary information on Brazillian regulators' behavior, a country with a civil law system and multiple administration levels.

For the IS area, the research is a bridge to the area of law, filling a gap primarily related to regulating emerging technologies. A problem that will be increasingly present in the face of the legal responsibility of programmers, CIOs, companies, and governments for developing and using AI and IoT solutions in a datafied society. For the other areas of knowledge, and especially for the area of law, the research is an invitation for more multidisciplinary research that seeks to contribute to the academia to pursue the Habermas communicative ideal of mutual understanding and possible consensus that reverberates in the political sphere. For researchers who intend to use the Habermas TCA, the research serves as a reference for integration with another theoretical framework.

From a practical point of view, the research helps to identify, within what would be the ideal process of discussion and regulation of emerging ICT, the strategic points of action of interest groups to influence proposals for laws and infra-legal regulations and the importance of hidden actors in this process. It is useful both for those who want to act strategically to obtain personal, business, or social sector benefits, as well as for academia, civil society groups, and individuals to accompany these movements of interest groups and act to

influence and curb regulatory capture attempts to obtain benefit at the expense of other parts of the population.

The Pandemic was a significant hindrance and source of research limitations. The fact that the interviewees were from the political elite and the field period coincided with the worst moments in the country in terms of the number of deaths, and consequent great political turmoil, was the main reason the guests refused to participate in the interviews. On the other hand, the need for social isolation forced the adjustment of the research method to an interview carried out through a videoconferencing platform. It expanded the universe of possible interviewees to states other than the researchers' residence. The alternative solution proved safe, with good visual and audio quality, easier to transcribe and to recover the interviewee's behavior.

Another relevant limitation that was not possible to circumvent concerns the lack of representation in legislative houses, at all levels, of blacks or browns and women. This dissonance with the Brazilian reality population in the legislative houses is reproduced in the Committees and the invited experts, reflecting an intrinsic bias in the sample of interviewees.

The last limitation, at the option of the researchers, was the non-inclusion in the interview universe of other actors who participated in the Public Hearings, such as academics and specialist professionals, representatives of companies or business associations, labor unions and associations of new workers, and organizations of civil society. An option that opens space for future research that addresses questions, for example:

a) Which companies participate in Public Hearings and Consultations? What do the contributions in these forums reveal about the Big Tech companies and Startups' strategies?
b) Which areas of academia participate in Public Hearings and Consultations? Are contributions in these forums multidisciplinary? Is there a convergence of understanding between the areas of the difficulties, values, needs, and concerns about ICT regulation?

In addition, other actors and other issues that the research revealed and that can be the object of future research are:

a) the academic preparation of prosecutors and judges for this new reality of emerging technologies in the face of the option for principled legislation;
b) the role of parliamentary assistants with social media and fake news;

c) parliamentary assistants and the intermediate level of executive personnel as a gateway to corporate lobbying;
d) lobbying strategies mediated by social media platforms algorithms; and
e) longitudinal studies that accompany the entire process of a theme or legislative initiative.

5 THE MULTIDISCIPLINARY CHALLENGE OF THE ICT REGULATION PROBLEM

A DISCRIMINANT ANALYSIS OF ACADEMIC FIELDS ABOUT THE ICT REGULATION PROBLEM

Abstract

The research is a descriptive study of the differences in attitudes and opinions of researchers from four grand Academic fields (Administration, IS, Law, and Sociology) about ICT regulation. The call for more regulations worldwide sparked the attention of the IS field to the scarcity of studies in which multidisciplinary is essential. We conducted a Multiple Discriminant Analysis of the answers to a survey with researchers from these areas. The questions assessed the experience and perception of difficulties, values, needs, and concerns raised in literature and previous qualitative research. In general, we found low participation and practical contribution and the recognition of the difficulties in regulating ICT. A few variables showed differences between the areas, some of which were unexpected. The research contributes by objectively describing the differences that challenge the multidisciplinary necessary to regulate ICT, which should be headed by the IS area but is not the case in Brazil.

Keywords: ICT regulation, Multidisciplinary, Academic fields, Discriminant Analysis.

5.1 Introduction

The regulation of ICT has begun to arouse academic interest in the IS area, but there is still a significant lack of research. Recent calls for papers from AIS basket journals (Gozman, Butler and Lyytinen, 2019; Aanestad et al., 2021) confirm the gap, highlighting the necessary multidisciplinary approach to study the problem, destined to assist policymakers in practice.

The multidisciplinary nature of a phenomenon stems from the possibility of studying the research problem from multiple theories and perspectives (Vaidya & Campbell, 2016), which results in a scientific production that takes a broad spectrum of technical, operational, practical, and philosophical positions (Zuiderwijk et al., 2021). The need to combine different research strands to achieve a cohesive interdisciplinary understanding of a phenomenon motivates seeking to know these strands (Jiang & Cameron, 2020; Elliot, 2011), which is usual in literature reviews (e.g., Coombs et al., 2020).

In our literature review on the difficulties of regulating ICT, we classified multidisciplinarity as a kind of difficulty inherent to the political environment in which discussions about regulation occur with the participation of diverse actors. The multidisciplinarity challenge reproduced in the political sphere of legal and regulatory discussions gains a novel dimension when the subject addressed involves emergent ICT and the digital economy.

Among the actors, academics and practitioners help legislators in different ways, such as through parliamentary debates and public consultations on regulatory proposals. However, what should we expect? Would an academic from the Administration area be more liberal and more averse to obstacles that inhibit innovation and entrepreneurship or concerns about Environmental, Social and Corporate Governance (ESG) principles already prevalent in the area? On the other hand, would an academic from the Sociology field be more favorable to state intervention to protect excluded groups and democracy or be more averse to limitations on freedom of expression? Would an academic from the Law field be more favorable to creating new regulations or be more comfortable defending the application of current legislation and the analysis of concrete cases based on analogy, hermeneutics, and jurisprudence? What to expect from an academic in the IS area, a greater aversion to controls and limitations that inhibit the creative development of methods for collecting, storing, processing, transmitting, and analyzing data, or does more in-depth technical knowledge enhance risk aversion to new technologies?

To answer these questions is to investigate the ontological assumptions of the problem that shape how the research object is seen and studied (Saunders et al., 2015). Not in the way the IS area borrowed and reinterpreted the ontology concept in its studies but in the original form of philosophy (Zúñiga, 2001). By portraying these assumptions in different fields of academia, it intends to provide a shared conceptualization of the problem for various stakeholders (Abdullah et al., 2016). Understanding the differences between basic assumptions or the meanings of concepts is critical when borrowing methods and theoretical schools from different disciplines (Mahieu et al., 2018; Nicolescu et al., 2018).

Our literature review found no investigations to overcome ontological and epistemological differences between disciplines.

The research problem refers to the multidisciplinary scenario of regulation of emerging ICT, especially the participation of different fields of Academia in discussing and constructing legislative and regulatory proposals.

This study is part of a broader research project that takes a critical philosophical position based on the Theory of Communicative Action (TCA) (Habermas, 1984).

The question we are addressing is: what are the differences between Academic fields regarding experience and perceptions concerning the ICT regulation problem?

At this stage, we aim to describe the differences between four grand academic areas (Administration, IS, Law, and Sociology) in terms of experience and perceptions about the problem of regulating ICT in Brazil. The specific objectives are: to describe the differences in participation and contribution to the discussions, the differences in perception of the difficulties in regulating ICT, and the differences in values and beliefs concerning ICT regulation.

Based on the challenges in regulating ICT raised in our literature review and on the worldview through values, needs, and concerns captured in interviews with eleven Brazilian parliamentarians, legislative assistants, and specialist bureaucrats who participated in public hearings in 2019, we conducted a survey with professors and researchers from the four grand academic areas. Each grand area incorporated related areas (e.g., IS - Informatics and Computer Science, Engineering, Mathematics, and Statistics). The analysis technique was the Multiple Discriminant Analysis (MDA), in which the grand academic area was the categorical dependent variable under analysis, taking the answers to each question based on our previous literature review and qualitative research as independent variables.

The analysis of 139 responses minimally covered the areas of study interest and revealed meager participation and effective contribution in general for all areas, which is contradictory to the assessment made by the respondents for the importance of participation. The assessment that the suggestions presented in public consultations are not considered, in which the IS area stood out, maybe one of the reasons for the lack of participation. Difficulties in regulating ICT were recognized as relevant. Most of the independent variables did not show discrimination between the areas. However, differences observed in some of the variables were surprising and challenging to explain, considering the academic characteristics of each area.

The rest of the article is organized as follows: in the next section, we present the multidisciplinary theme, its relationship with the problem of ICT regulation, the difficulties in regulating raised in our previous literature review, and the role of the Academy in the discussions. We then describe the research method, findings, and discussion of the results to conclude with the theoretical and practical implications of the study and suggestions for future research.

5.2 Background

5.2.1 The multidisciplinary and the ICT regulation

Since the 1990s, IS research has moved beyond corporate back-office problems and productivity tools, leaving the exclusive focus centered on organizational development and IT solutions adoption (Beath et al., 2013). This movement followed the idea of IT ubiquity, giving it a central strategic position for all organizations (Sawyer & Winter, 2011), resulting in a double challenge for the IS area: to expand the disciplinary boundary to a broader set of IS topics and to engage with other disciplines to understand phenomena arising from or related to IS (Tarafdar & Davison, 2018).

Multidisciplinarity, Interdisciplinarity, and transdisciplinarity are often incorrectly used as synonyms (Choi & Pak, 2006). The difference is subtle but already well discussed in the literature (e.g., Klein, 1990). Multidisciplinary refers to the knowledge of a phenomenon produced by different disciplines that add up but are not integrated to seek a new, harmonized, and cohesive level of analysis, such as that covered by interdisciplinarity (Choi & Pak, 2006). Transdisciplinarity goes beyond the knowledge produced in academia and seeks a holistic view of the phenomenon. (Choi and Pak, 2006; Klein, 1990; Serna, 2015).

Integrating knowledge from several domains is not a new challenge for the IS. It is an inherent field trait (Webster & Watson, 2002). However, the contribution of the IS area is still predominantly intradisciplinary (Tarafdar & Davison, 2018).

Calls for papers (e.g., Beath et al., 2013; Zuiderwijk et al., 2021) from AIS basket journals have sought to stimulate the integration and expansion of the discipline's boundaries, seeking to contribute to and influence different academic areas. Some of the answers propose new theories, such as the Interdisciplinary Structuration Theory (Puron-Cid, 2013), frameworks

(e.g., Ciriello, 2021), or new research methods, such as Competitive Benchmarking (Ketter et al., 2016).

Some researchers seek knowledge in other areas through interdisciplinary literature reviews motivated by the need for a holistic view of the problems (e.g., Elliot, 2011), by the recognition of the lack of consensus on key findings and implications (Coombs et al., 2020), which undermines more cohesive treatment (Smith et al., 2011).

These contributions are essential to deal with socio-technical problems that are increasingly complex and have vast repercussions in different ways in the business environment, society, and governments, which cannot be reduced to a mere empirical measurement (Raadschelders, 2011).

Artificial intelligence, facial recognition, cryptocurrencies, autonomous vehicles, and digital platforms are some recurring themes involving emerging ICT in which the concern to discuss and establish limits and rules for development and use is present in the studies of multilateral organizations (e.g., ILO, 2021), standard-setting organizations (e.g., IEEE, 2019), government agencies (e.g., High-Level Expert Group on Artificial Intelligence, 2019), consulting companies (e.g., Eggers and Turley, 2018), and non-government organizations (NGO) (e.g., Ada Lovelace Institute and AI Now Institute and Open Government, 2021). Following this trend, it is common to find a paradoxical situation where the CEOs of Big Tech companies claim more regulation for their business (e.g., Bartz and Culliford, 2021). Definitively, a new direction of interdisciplinary research that brings the area of IS closer to that of political studies is opened (Pelizza, 2021).

The ICT regulation theme is still immature in the IS field but gaining attention. Some of the calls for papers from the AIS basket journals show the path starting from the ethical concern with AI and Analytics for society (Dennehy et al., 2016), passing through the call for responsible research (Davison et al., 2017), the impact to the socio-economic development of digital platforms in developing countries (Davison et al., 2018), the implications of winner-takes-all platform economics, and the social, environmental and economic implications of the blockchain (M. Rossi et al., 2019), the concern with fake news phenomenon on the Internet (Dennis et al., 2019), and with the failure of digital transformation initiatives in Latin American context (Joia et al., 2020). This path led to the calls for papers from IS basket journals highlighting the gap in research and suggesting questions like: “how to bridge the gap between ethics and policy (e.g., for AI)? Where is the overlap and divergence?” (Gozman et al., 2019),

or “how should policymakers develop frameworks, regulations, and laws on ethics and accountability regarding the deployment of digital technologies in society?” (Aanestad et al., 2021).

In our literature review on the difficulties of regulating ICT, we selected 41 articles from journals or conferences published between 2009 and 2019. We had to adjust the initial planning to deal with the difficulty of integrating with law scholars and the imbalance in the different legal systems favorable to journals from common law countries.

The philosophy field greatly influenced most studies due to ethical discussions like ethical issues in crowdsourcing practices (Schlagwein et al., 2019) and privacy dilemmas in healthcare (Mittelstadt & Floridi, 2016), or ethics by design (Schuelke-Leech et al., 2019).

Luciano Floridi and Jürgen Habermas appeared as the most used theoretical lens. The latter shows the advantage of being used in empirical studies (Schlagwein et al., 2019; Stahl et al., 2012), which are more scarce.

5.2.2 The difficulties in regulating ICT and the IS role

Notwithstanding the gap in studies focusing on regulators in the literature review, we got insights from the authors about regulators’ difficulties in regulating ICT, which we separated into six groups described in Table 5.1.

Table 5.1 Regulators’ difficulties in regulating ICT found in the literature review

Group	Difficulties	Example
Technical issues	Related to computational limitations and decision-making modeling complexity	Access to the data and the algorithms (Hacker, 2018), ethics by design (Weng et al., 2015).
Legal issues	Involving technical aspects of the law field	Competition and conflict between different forms of regulation (Hacker, 2018), Deregulation aversion (Vogelsang, 2017)
Drivers	Externalities that influence the regulation process	AI apocalypse view (Wasilow & Thorpe, 2019), Failures, accidents, or death caused by autonomous vehicles (Schuelke-Leech et al., 2019)
Environmental issues	Related to the political environment in which the regulation process occurs and geopolitical aspects.	Business lobbying (Benvenisti, 2018), Multidisciplinary (Mahieu et al., 2018)
Societal objectives	Philosophical and sociological questions.	The complexity of human interaction (Pagallo, 2015), public and policymakers’ moral imagination (Schuelke-Leech et al., 2019)

Group	Difficulties	Example
Individual behavior or trace	Regulators' characteristics	Bounded rationality (Sokolovska & Kocarev, 2018), lacks expertise (Calo, 2015)

Multidisciplinary was classified in the group of difficulties inherent to the political environment in which discussions about regulation occur with the participation of multiple actors with different academic backgrounds, professional life experiences, economic power, power of communication and persuasion, values, beliefs, and concerns. Among the actors, academics and practitioners help legislators by participating as guests in parliamentary committee debates, contributing criticism and suggestions in public consultations on regulatory proposals, or are hired by the government, business sectors or civil society, or even by multilateral organizations to analyze and give an opinion on a given problem.

The reviewed literature does not address which areas of Academia participate, and most influence the outcome of the discussions, nor the difference between the perception of academics about the problems related to ICT regulation. Therefore, whether or not the necessary holistic multidisciplinary approach to balance the positive and negative outcomes of emergent ICT, which Jeroen van den Hoven calls "Comprehensive Engineering" (Maedche, 2017), is achieved.

The IS area is specialized both in the technical issue related to emerging ICTs and in the ability to capture and understand the ontology of the problem from the user's point of view (Fonseca & Martin, 2007), which qualifies the area in a position of strategic capacity to the discussions involving the legal repercussions of the broad transformations that the pervasiveness of the digitalization of life brought (Beath et al., 2013, Riemer and Peter, 2021). Without the participation of the IS area, ICT regulation will hardly be effective and achieve the intended objectives (Fast et al., 2022).

The following section presents the research method.

5.3 Method

The research is a descriptive study of the differences in attitudes and opinions of researchers from four grand Academic fields (Administration, IS, Law, and Sociology) about ICT regulation. We described their experiences discussing and contributing to law and

regulation proposals and their opinions about some of the difficulties in regulating ICT raised in our previous literature review. Besides, we tried to capture their perception of values, needs, and concerns which represent the worldview of a sample of eleven parliamentarians, their direct assistants, and technocrats from the executive branch and prosecution service whom we interviewed in the previous stage of this research. They all participated in Public Hearings about ICT regulation in 2019, which occurred in Science and Technology specialized committees from the legislative houses at Brazil's three levels of government (Federal, State, and Municipal).

The grand Administration (A) area also includes Accounting and Economics. Informatics and Computer Science, Engineering, Mathematics, and Statistics are in the grand field of Information Systems (C). The grand area of Sociology (S) includes Anthropology, Political Science, and Philosophy. The Law (L) field is the only individualized area.

5.3.1 Research instrument (questionnaire)

The technique used in the study was a survey with professors and researchers from the four grand areas. The research instrument (APPENDIX H) was divided into four sections with objectives and examples of questions described in Table 5.2.

Table 5.2 Research instrument description

Section / Number of questions	Objective	Dimensions	Examples of questions
Demographic profile Four questions	Survey the generational profile, the culture of the legal system by the country of birth, the areas of the academic background of the respondents, and the possible professional link to the public administration that could result in a bias in the results.	-	What is your age group? What is your born country? Identify the area(s) of knowledge of your academic background. Include undergraduate, master, and doctoral areas.
Experience in the emerging ICT regulation Three questions	Survey researchers' experiences in the ICT regulation process in recent years in Brazil.	Participation Contribution	How have you participated in ICT regulation discussions in the last five years? If you contributed with criticisms or suggestions in the Public Consultations, please indicate which ones.

Section / Number of questions	Objective	Dimensions	Examples of questions
Difficulties in regulating emerging ICTs One question with twelve items was evaluated.	Raise the researcher's perception of difficulties in regulating ICT identified in the literature review and classified into six groups.	Difficulties	In your opinion, how do the elements below impact emerging ICT regulation in terms of difficulty to be overcome? Access to company data and algorithms
Values, Needs, and Concerns Three questions with ten, nine, and ten items each.	Assess the respondent's importance to some statements or doubts in excerpts from interviews classified as values, needs, and concerns.	Worldview	For each selected interview excerpt, mark the degree of importance for the value associated with the statement or doubt presented.

The study's objective is to determine whether differences between the grand academic groups exist, which are the elements of the categorical dependent variable under analysis, taking the answers to each question based on our previous qualitative research as independent variables. Besides, we want to determine which of the independent variables contributes most to the differences in the average score profiles of the academic groups.

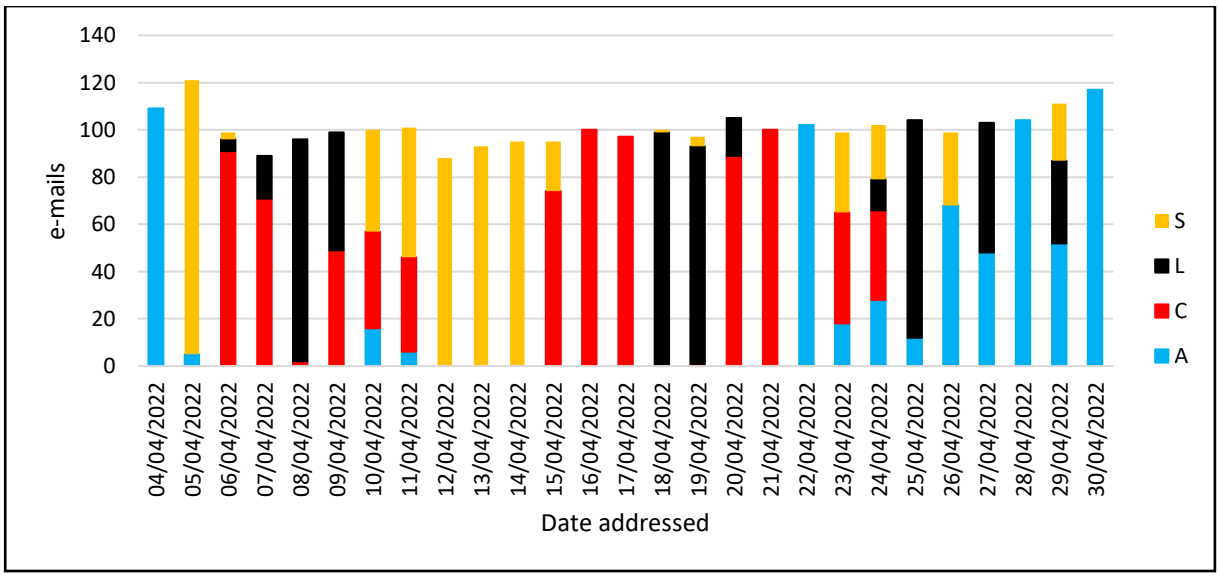
APPENDIX I details the research model by describing the variables related to each question of the research instrument (APPENDIX H), the measurement scales, the actions of conversion into dummy variables, corrections of inconsistency, and the exclusion of records due to missing data.

5.3.2 Sample collection

The invitation to participate in the research was disseminated through e-mail, sent between 04/04 and 04/30/2022, and answered until 05/10/2022, complemented by the authors' social network academic groups. We collected e-mails on the pages of educational institutions for courses in areas of research interest. In addition to the University of São Paulo, the selection of institutions was based on the Assessment of the National Postgraduate System (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), 2022), taking the best-qualified courses in each of the areas, listed in APPENDIX I. Following up on the evolution of responses by area of knowledge, we prioritized the selection of courses in areas with fewer respondents.

In the end, 2710 e-mails were sent, with the profile by area illustrated in Figure 5.1.

Figure 5.1 Evolution of e-mails addressed by knowledge area during data collection.



We collected 170 responses whose treatment and results are described in the next section.

5.3.3 Quantitative analysis technique

The analysis technique was the Multiple Discriminant Analysis (MDA) which is suitable when the dependent variable is non-metric multichotomous, the independent variables are metrics, and the primary objective is to understand group differences (Hair Jr et al., 2018, p. 27). Nominal independent variables were converted into dummy variables and ordinal variables to a numeric scale.

To understand group differences, we carried out the analysis by combining a subset of independent variables to represent the discrimination dimensions indicated in Table 5.2.

We ran the Box's M test in R (Fox et al., 2021) for each dimension to assess the independent variables' assumption of equal dispersion and covariance matrices. The tests in all dimensions rejected (significant p-value) the null hypothesis that the observed covariance matrices for the independent variables are equal across groups. Therefore, we opted for the Quadratic Discriminant Analysis (QDA) once it is recommended when the assumption of a common covariance matrix for all classes is not observed (Hair Jr et al., 2018, p. 489). We ran the analysis in R with the MASS package (Venables & Ripley, 2002).

The results were analyzed by visual inspection of the group means for the variables in each dimension.

The following section presents the findings on respondents' demographics, their experience and differences in the perception of the difficulties in regulating ICT, and the differences in worldview.

5.4 Findings

5.4.1 Demographics

We received a total of 170 responses. We excluded ten respondents with academic backgrounds exclusively in other areas (e.g., psychology, biology, medicine, dentistry) than those of interest to the study. In addition, we excluded 21 respondents who failed to answer more than 50% of the questions. Thus, we reached 139 respondents, of which 110 completed at least 97% of the questions. The question with the highest non-response rate (11%) was the difficulty of "Sharing true values among the various stakeholders". All others had an abstention rate of less than 10%.

Thirty-four respondents reported academic background in more than one area, including at least one of those of research interest. Table 5.3 describes the distribution of responses by academic area and age. Despite not meeting the condition of being mutually exclusive (Hair Jr et al., 2018, p. 485), we decided to keep the analysis of these responses as a multidisciplinary ("M") independent group to see whether it discriminates from the pure areas.

Table 5.3 Distribution of respondents by grand academic area and age group

Academic Area	Responses	%	20-29	30-39	40-49	50-59	>=60
A[(a)]	25	18%		5	5	6	9
C[(b)]	34	24%	1	1	11	14	7
L[(c)]	25	18%	2	6	3	11	3
S[(d)]	21	15%	1	4	6	6	4
M[(e)]	34	24%	1	3	9	11	10
AC	*17*	*12%*		*2*	*3*	*4*	*8*
ACL	*1*	*1%*			*1*		
ACO[(f)]	*1*	*1%*				*1*	
AL	*4*	*3%*			*1*	*3*	
ALS	*1*	*1%*			*1*		

Academic Area	Responses	%	20-29	30-39	40-49	50-59	>=60
AO	*1*	*1%*				*1*	
AS	*5*	*4%*	*1*	*1*	*2*		*1*
CL	*1*	*1%*				*1*	
LO	*1*	*1%*				*1*	
LS	*1*	*1%*			*1*		
SO	*1*	*1%*					*1*
Total	139	100%	5	19	34	48	33

Note: (a) A - Administration, Accounting, and Economics. (b) C - Information Systems, Informatics and Computer Science, Engineering, Mathematics, and Statistics. (c) D - Law. (d) S - Sociology, Anthropology, Political Science, and Philosophy. (e) M - Multidisciplinary, including at least one grand area of interest. (f) O – Other areas (e.g., medicine, biology).

All areas, including the multidisciplinary group, exceeded the recommended minimum of 20 respondents for the discriminant analysis (Hair Jr et al., 2018, p. 487). Individually, 12 of the 41 questions have an area with less than 20 respondents, with a minimum of one question with 16 respondents in the Sociology area. The other 11 questions reached at least 18 respondents in each area.

As for the legal culture, 97% of the respondents were Brazilians, and the few isolated cases of foreigners were born in civil law countries (Spain, France, Italy, Portugal, and Russia).

Only seven respondents were employees of bodies or entities of the executive, legislative, prosecution service, or judiciary. 30% had no ties to the government, while 65% were professors or researchers at public universities.

5.4.2 Experience in the emerging ICT regulation

Almost half of the respondents had some experience with ICT regulation, as summarized in Table 5.4. The grand area of Sociology was the only one in which the number of participants exceeded the number of non-participants.

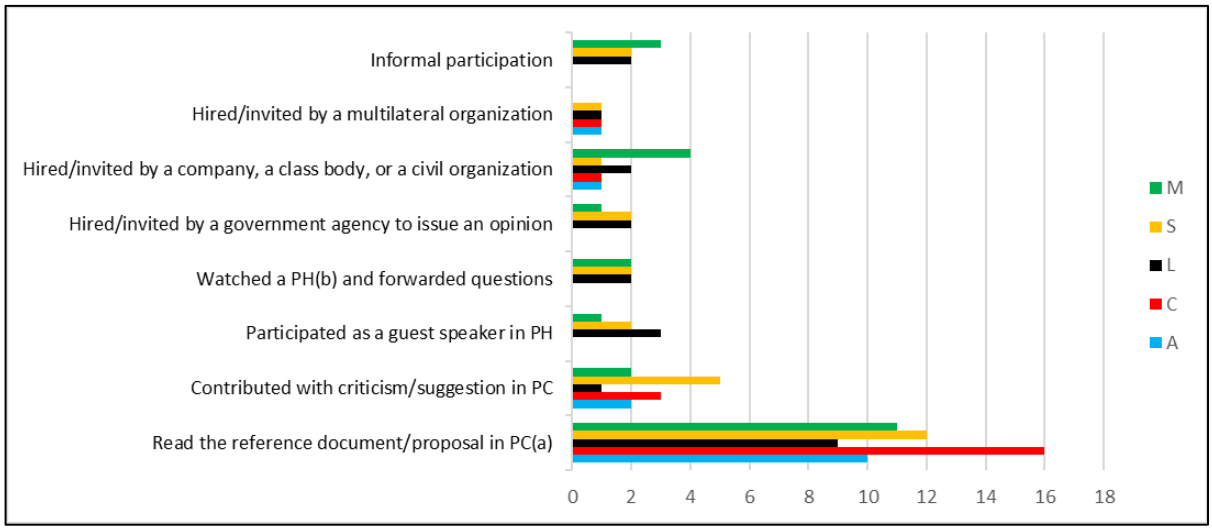
Table 5.4 Participation in any of the options by grand area and Contribution to any of the ICT regulation options

	Participation					Contribution					
Area	No	%	Yes	%	Total	No	%	Yes	%	Total	%
A	14	56%	11	44%	25	9	82%	2	**18%**	11	100%
C	18	53%	16	47%	34	11	69%	5	**31%**	16	100%
L	14	56%	11	44%	25	8	73%	3	27%	11	100%
S	9	**43%**	12	**57%**	21	9	75%	3	25%	12	100%
M	20	59%	14	41%	34	9	64%	5	**36%**	14	100%

	Participation					Contribution					
Area	No	%	Yes	%	Total	No	%	Yes	%	Total	%
Total	75	**54%**	64	**46%**	139	46	**72%**	18	28%	64	100%

The majority (72%) of those who participated indicated a single form of contribution. More than three forms of participation were only observed for a few respondents (6%) from the Law and Sociology areas. Reading the reference document or proposal in Public Consultation was the leader option, as illustrated in Figure 5.2.

Figure 5.2 Forms of participation in the ICT regulation process experienced by respondents from each area



Note: (a) PC – Public Consultatio. (b) PH – Public Hearing

Figure 5.3 presents the means results for each area obtained from the QDA for the independent variables of participation (Table 5.5) and contribution (Table 5.6). Both participation and contribution are presented in two ways. First, participation and contribution are counted once, regardless of how many ways the respondents indicated (Any). The second, for each respondent, sums up the different forms of participation and contribution indicated (Total).

QDA confirmed that the Sociology area has slightly higher participation in some options than the other areas that do not show significant differences. Considering the participation weighted by the number of participation alternatives indicated in the answers, this prominence of the Sociology area is amplified, followed by the Law field.

The Administration area contributed the least to the regulation proposals, differing slightly from the other areas.

Figure 5.3 Radar chart of QDA group means of Participation and Contribution independent variables for each academic area.

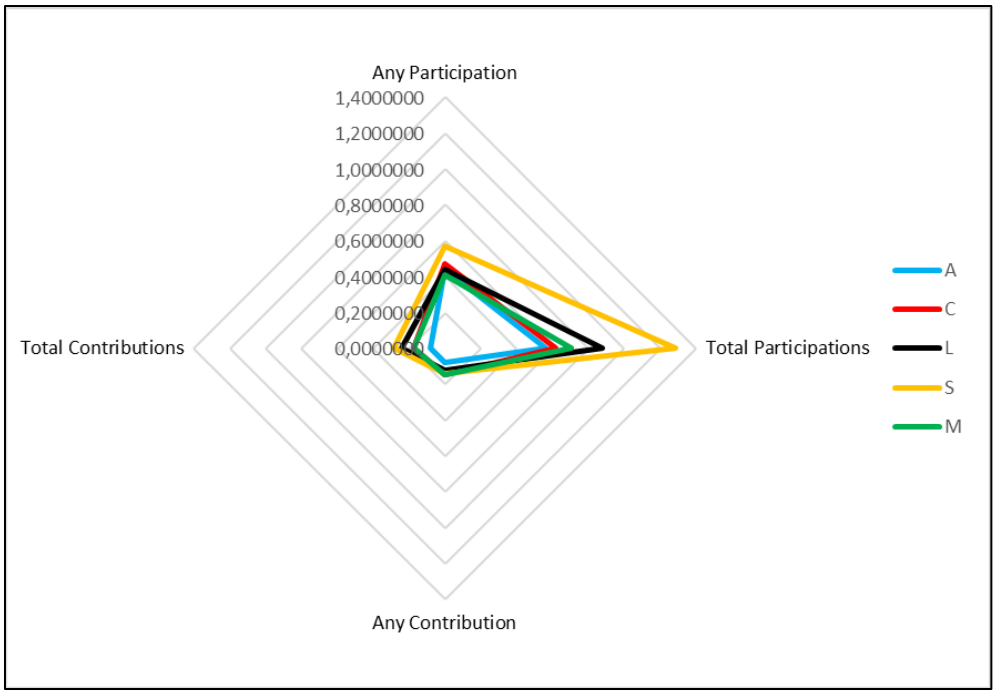


Table 5.5 QDA Group means for any and total Participation

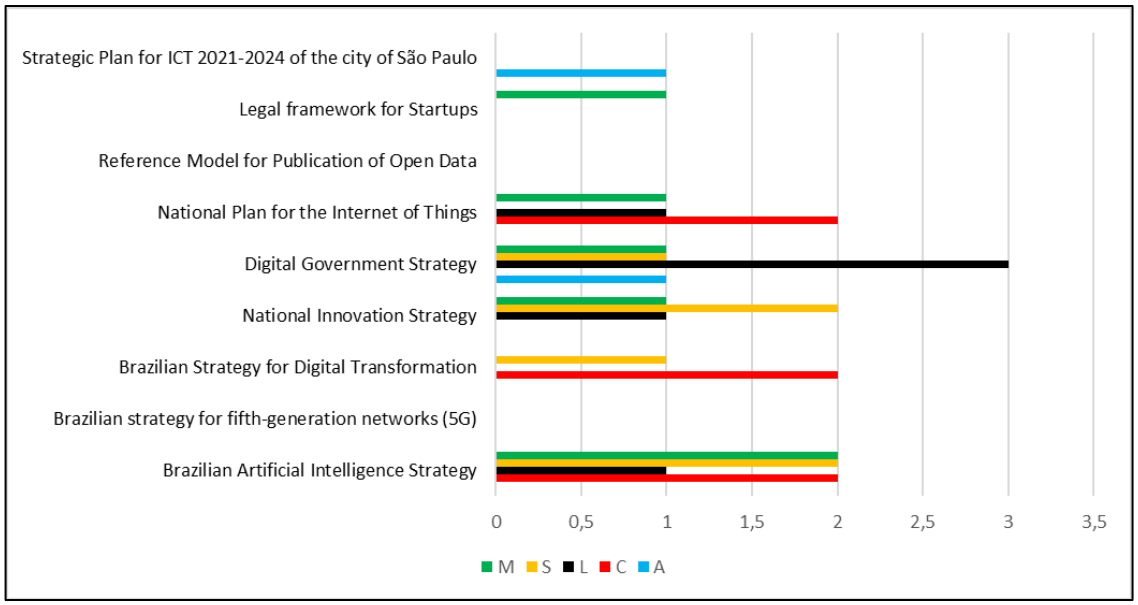
	Any Participation				Total Participation						
	No	Yes	Total	Mean	1	2	3	5	6	Total	Mean
A	14	11	25	0.4400000	9	1	1	-	-	11	0.5600000
C	18	16	34	0.4705882	13	1	2	-	-	16	0.6176471
L	14	11	25	0.4400000	7	2	-	1	1	11	0.8800000
S	9	12	21	**0.5714286**	7	1	2	-	2	12	**1.2857143**
M	20	14	34	0.4117647	10	1	2	-	1	14	0.7058824
Total	75	64	139	-	46	6	7	1	4	64	

Table 5.6 QDA Group means for any and total Contribution

	Any Contribution				Total Contribution				
	No	Yes	Total	Mean	1	2	4	Total	Mean
A	23	2	25	**0.0800000**	2	-	-	2	**0.0800000**
C	29	5	34	0.1470588	4	1	-	5	0.1764706
L	22	3	25	0.1200000	2	-	1	3	**0.2400000**
S	18	3	21	0.1428571	2	-	1	3	**0.2857143**
M	29	5	34	0.1470588	4	1	-	5	0.1764706
Total	121	18	139	-	14	2	2	18	

The Public Consultations that received the most contributions were the Brazilian AI Strategy and the Digital Government Strategy. On the contrary, the Brazilian strategy for 5G networks and the Reference Model for Publication of Open Data did not receive any contribution, as shown in Figure 5.4.

Figure 5.4 Public Consultations related to the regulation of ICT that received criticism and suggestions from respondents in each area.



Among those who contributed, the distribution between those who considered the criticisms and suggestions were used, those who thought they were not used, and those who did not check were relatively homogeneous, as described in Table 5.7. The areas of IS and Sociology had a greater weight on those who were not satisfied with having their contributions disregarded.

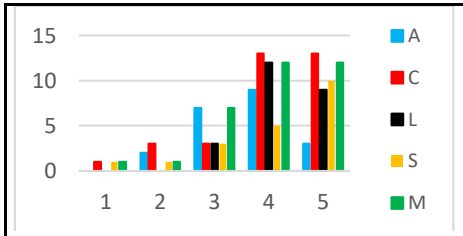
Table 5.7 The usefulness of contributions from each area.

Area	Yes, a good part	%	No, very few	%	I do not know. I did not check	%	Total	%
A	1	50%		0%	1	50%	2	100%
C	1	20%	3	**60%**	1	20%	5	100%
L	1	33%		0%	2	67%	3	100%
S		0%	2	**67%**	1	33%	3	100%
M	2	40%	1	20%	2	40%	5	100%
Total	5	28%	6	33%	7	39%	18	100%

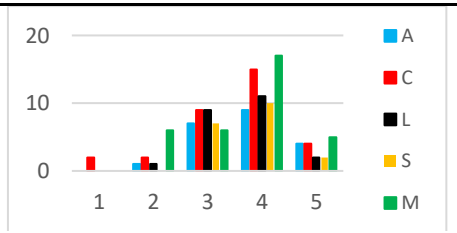
5.4.3 Differences in the perception of the difficulties in regulating ICT

The respondents rated most of the difficulties with a fair to a high degree of difficulty (Table 5.8), as illustrated in Figure 5.5. Access to corporate data and algorithms and the Business Lobby were the only difficulties rated as extremely difficult. The AI Apocalyptic Cinematic Vision was the only difficulty with an overall trend rating from fair to low difficulty.

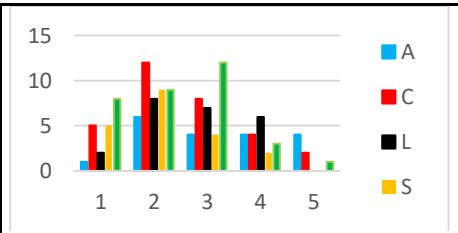
Figure 5.5 Distribution of the respondents' classification of the degree of difficulty for each alternative presented.



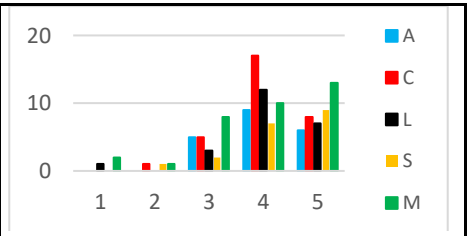
Access to corporate data and algorithms



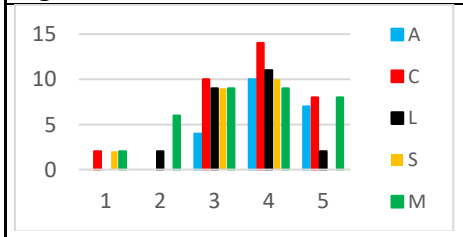
Competition and conflict between different forms of regulation



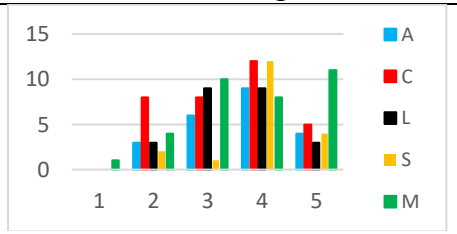
The apocalyptic vision of artificial intelligence in cinema



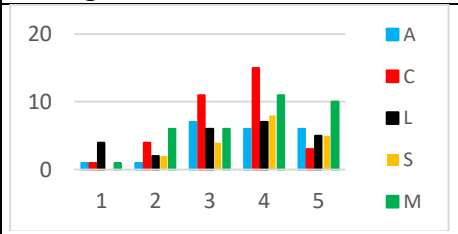
Business lobbying



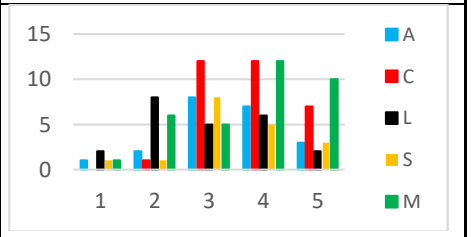
The complexity of human interaction



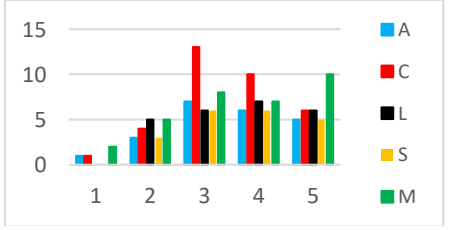
Relying entirely on information/opinions from professional or business organizations



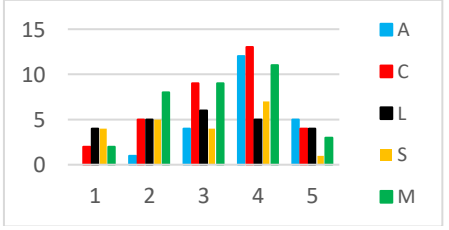
Incorporate ethics in the design, development, and use of technological artifacts



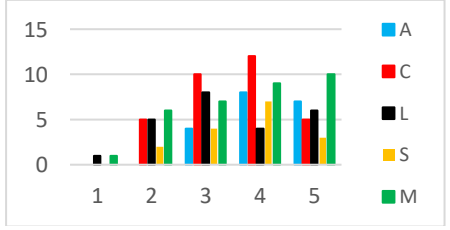
The enforcement of existing legislation



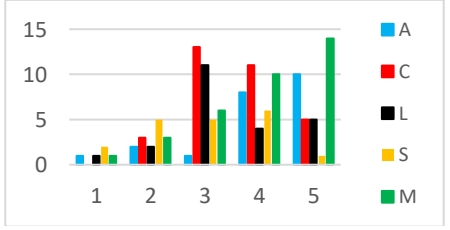
Occurrence of failures/fatalities or criminal use with high media coverage



Multidisciplinary



Sharing true values among the various stakeholders



A national culture that influences the flexibility, bureaucracy, and efficiency of regulators

Note: (a) X-axis scale the degree of difficulty: [1] No difficulty; [2] Few; [3] Reasonable; [4] Lots of; [5] Extreme difficulty.

Table 5.8 Respondents' classification of the degree of difficulty for each alternative presented

Area	Degree of difficulty	dif_acesso	dif_formareg	dif_iaapocal	dif_lobby	dif_relhuman	dif_confia	dif_etica	dif_tradleg	dif_falha	dif_multidisc	dif_valorverd	dif_cultura
A	No difficulty	-	-	1	-	-	-	1	1	1	-	-	1
	Few	2	1	6		-	3	1	2	3	1		2
	Reasonable	7	7	4	5	4	6	7	8	7	4	4	1
	Lots of	9	9	4	9	10	9	6	7	6	12	8	8
	Extreme difficulty	3	4	4	6	7	4	6	3	5	5	7	10
C	No difficulty	1	2	5	-	2	-	1	-	1	2	-	-
	Few	3	2	12	1	-	8	4	1	4	5	5	3
	Reasonable	3	9	8	5	10	8	11	12	13	9	10	13
	Lots of	13	15	4	17	14	12	15	12	10	13	12	11
	Extreme difficulty	13	4	2	8	8	5	3	7	6	4	5	5
L	No difficulty	-	-	2	1	-	-	4	2		4	1	1
	Few	-	1	8	-	2	3	2	8	5	5	5	2
	Reasonable	3	9	7	3	9	9	6	5	6	6	8	11
	Lots of	12	11	6	12	11	9	7	6	7	5	4	4
	Extreme difficulty	9	2	-	7	2	3	5	2	6	4	6	5
S	No difficulty	1	-	5	-	2	-	-	1		4	-	2
	Few	1		9	1	-	2	2	1	3	5	2	5
	Reasonable	3	7	4	2	9	1	4	8	6	4	4	5
	Lots of	5	10	2	7	10	12	8	5	6	7	7	6
	Extreme difficulty	10	2	-	9		4	5	3	5	1	3	1
M	No difficulty	1	-	8	2	2	1	1	1	2	2	1	1
	Few	1	6	9	1	6	4	6	6	5	8	6	3
	Reasonable	7	6	12	8	9	10	6	5	8	9	7	6
	Lots of	12	17	3	10	9	8	11	12	7	11	9	10
	Extreme difficulty	12	5	1	13	8	11	10	10	10	3	10	14
Total Geral		131	129	126	127	134	132	132	128	132	133	124	130

QDA revealed no significant discrimination between areas in the respondents' assessment of most difficulties, as illustrated in Figure 5.6 (Table 5.9). The Administration area showed the most apparent one regarding the difficulty "accessing corporate data". The "enforcement of existing legislation" was another difficulty in which assessment by the IS area and the multidisciplinary background respondents was higher than in other academic fields. The last difference was the Sociology area regarding the evaluation of the difficulties of "sharing true values among the various stakeholders" and "a national culture that influences the flexibility, bureaucracy, and efficiency of regulators", especially in this case in comparison with the respondents with a multidisciplinary background.

Figure 5.6 Radar chart of the QDA group means for Difficulties regulating ICT as independent variables for each academic area.

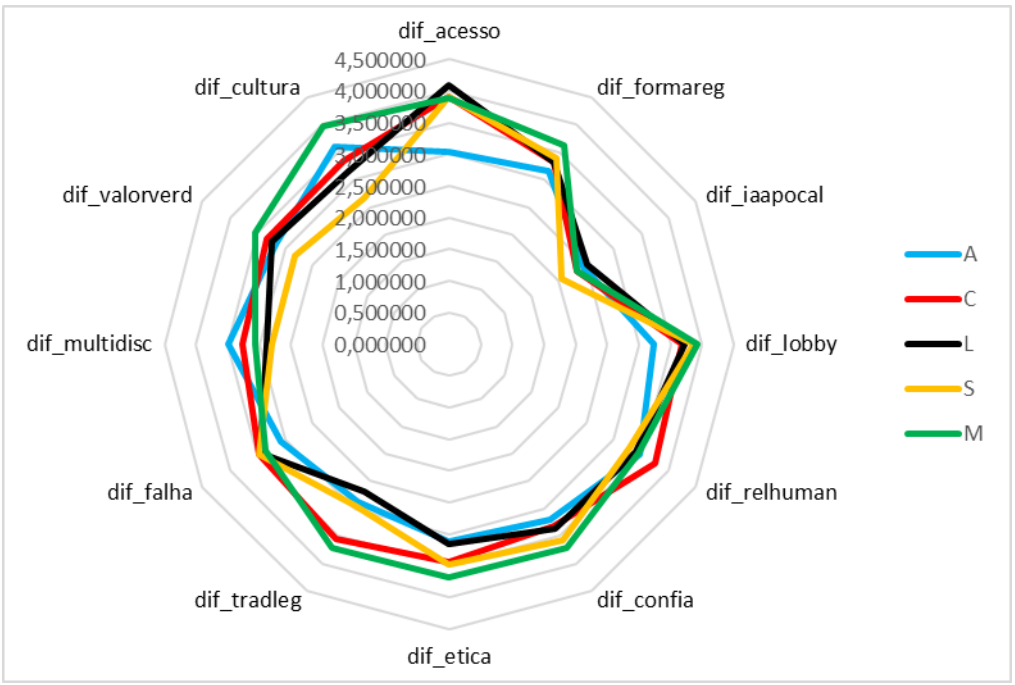


Table 5.9 QDA group means for Difficulties regulating ICT as independent variables for each academic area.

	Areas QDA Group means				
Difficulty (Variable)	A	C	L	S	M
Access to company data and algorithms (dif_acesso)	**3.040000**	3.911765	4.080000	3.904762	3.882353
Competition and conflict between different forms of regulation (dif_formareg)	3.160000	3.323529	3.320000	3.380952	3.617647
The apocalyptic vision of artificial intelligence in cinema (dif_iaapocal)	2.440000	2.323529	2.520000	2.047619	2.323529
Business lobbying (dif_lobby)	**3.240000**	3.676471	3.720000	3.857143	3.911765

Difficulty (Variable)	Areas QDA Group means A	C	L	S	M
The complexity of human interaction (dif_relhuman)	3.480000	3.764706	3.400000	3.285714	3.441176
Relying entirely on information/opinions from professional or business organizations (dif_confia)	3.200000	3.323529	3.360000	3.571429	3.705882
Incorporate ethics in the design, development, and use of technological artifacts (dif_etica)	3.120000	3.441176	3.160000	3.476190	3.676471
The enforcement of existing legislation (dif_tradleg)	2.880000	**3.558824**	2.680000	2.952381	**3.705882**
Occurrence of failures/fatalities or unlawful use with high media coverage (dif_falha)	3.080000	3.470588	3.440000	3.476190	3.352941
Multidisciplinary (dif_multidisc)	**3.480000**	**3.264706**	2.880000	2.809524	**3.058824**
Sharing true values among the various stakeholders (dif_valorverd)	3.160000	3.323529	3.240000	**2.809524**	3.529412
A national culture that influences the flexibility, bureaucracy, and efficiency of regulators (dif_cultura)	3.600000	3.352941	3.160000	**2.666667**	3.970588

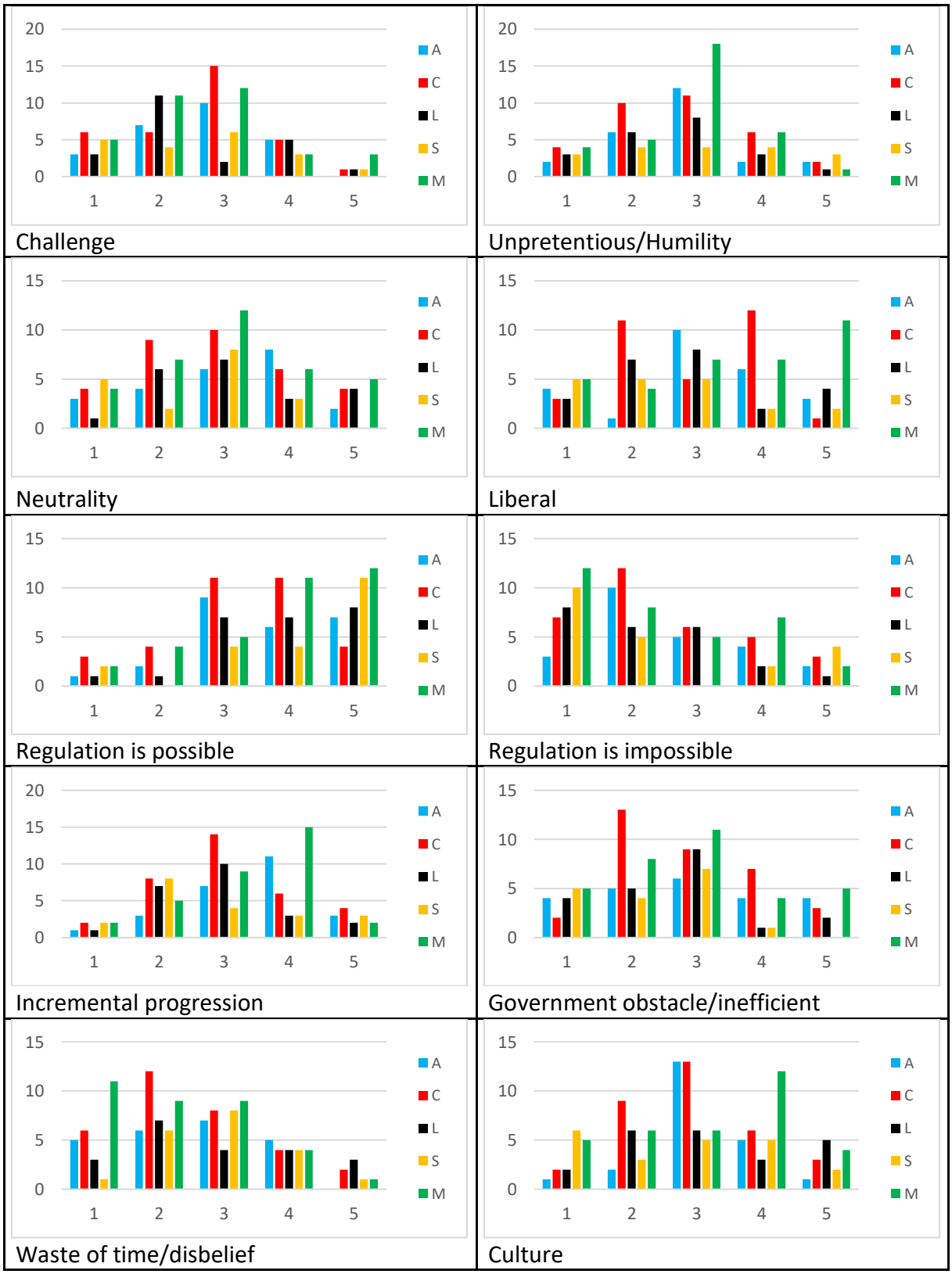
5.4.4 The differences in worldview

Most of the values evaluated by the respondents (Table 5.10) did not show a clear trend, as can be observed in Figure 5.7. The only exception was the value expressing the belief that it is possible to regulate ICT in contrast with the disbelief. The perception that it is possible to regulate was considered very important, while the perception that it is not possible to regulate was evaluated as of little importance. Another lighter but noticeable trend that makes sense with this result is the one that classifies the value of wasted time with the discussions as of little importance.

The needs (Figure 5.8 and Table 5.11) presented very marked trends, such as the one that places transparency, human dignity, diversity, and the need for long-term planning as very important. The only need with a slight tendency to rank as minor importance was nationalism.

Concerns (Figure 5.9 and Table 5.12) had a similar result with a ranking trend more important for concern about the justice divide, the digital divide, and the universality of benefits. Furthermore, the only one with a tendency of minor importance ranking was concerned with a punitive bias.

Figure 5.7 Distribution of the respondents' classification of each value importance.



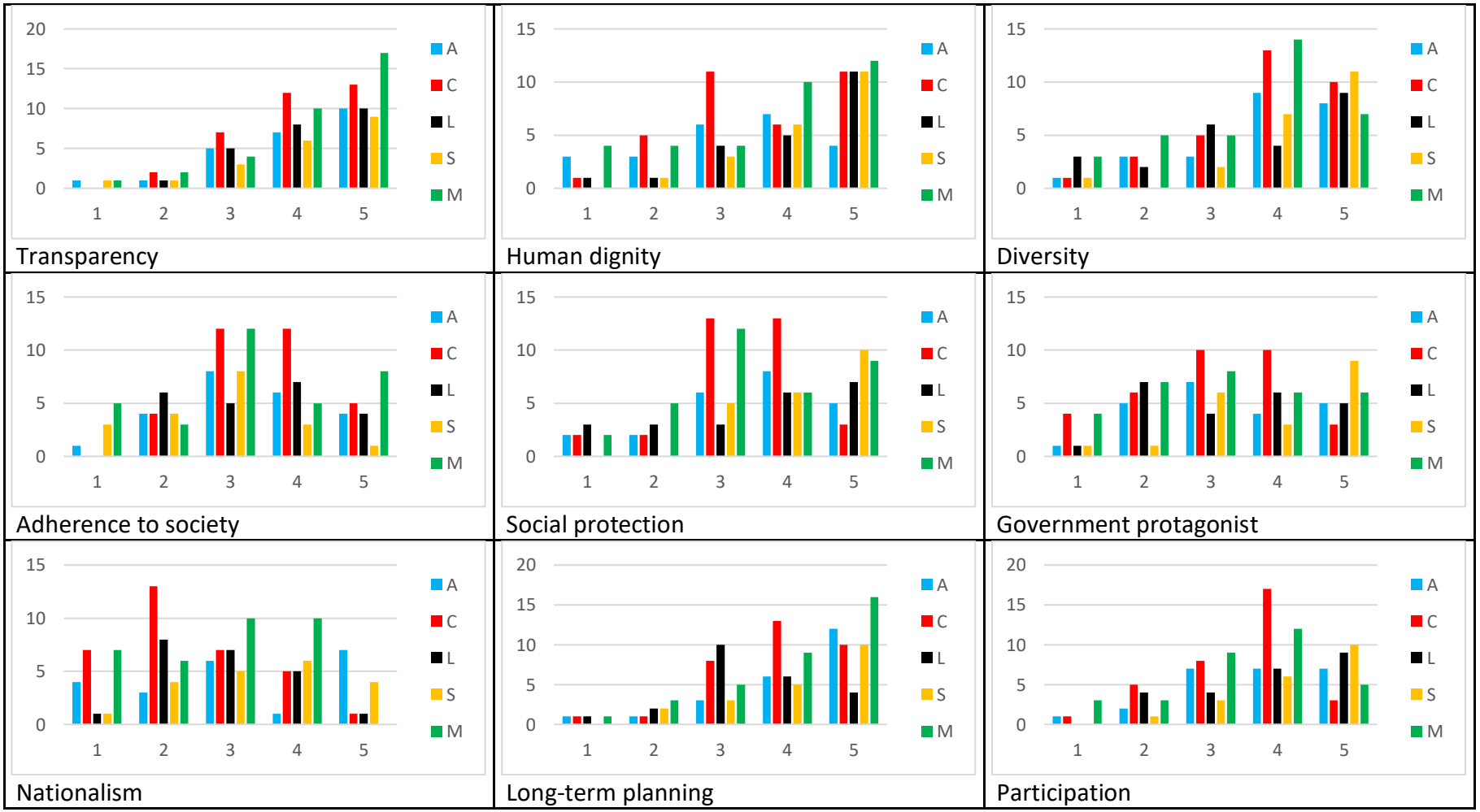
Note: (a) X-axis scale the degree of importance: [1] Irrelevant [2] Little importance [3] Important [4] Very important [5] Essential.

Table 5.10 Respondents' classification of each Value's importance

		Values									
Area	Level Importance	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
A	Irrelevant	3	2	3	4	1	3	1	4	5	1
	Little importance	7	6	4	1	2	10	3	5	6	2
	Important	10	12	6	10	9	5	7	6	7	13
	Very important	5	2	8	6	6	4	11	4	5	5
	Essential	-	2	2	3	7	2	3	4	-	1
	Total	25	24	23	24	25	24	25	23	23	22
C	Irrelevant	6	4	4	3	3	7	2	2	6	2
	Little importance	6	10	9	11	4	12	8	13	12	9
	Important	15	11	10	5	11	6	14	9	8	13
	Very important	5	6	6	12	11	5	6	7	4	6
	Essential	1	2	4	1	4	3	4	3	2	3
	Total	33	33	33	32	33	33	34	34	32	33
L	Irrelevant	3	3	1	3	1	8	1	4	3	2
	Little importance	11	6	6	7	1	6	7	5	7	6
	Important	2	8	7	8	7	6	10	9	4	6
	Very important	5	3	3	2	7	2	3	1	4	3
	Essential	1	1	4	4	8	1	2	2	3	5
	Total	22	21	21	24	24	23	23	21	21	22
S	Irrelevant	5	3	5	5	2	10	2	5	1	6
	Little importance	4	4	2	5		5	8	4	6	3
	Important	6	4	8	5	4		4	7	8	5
	Very important	3	4	3	2	4	2	3	1	4	5
	Essential	1	3	-	2	11	4	3		1	2
	Total	19	18	18	19	21	21	20	17	20	21
M	Irrelevant	5	4	4	5	2	12	2	5	11	5
	Little importance	11	5	7	4	4	8	5	8	9	6
	Important	12	18	12	7	5	5	9	11	9	6
	Very important	3	6	6	7	11	7	15	4	4	12
	Essential	3	1	5	11	12	2	2	5	1	4
	Total	34	34	34	34	34	34	33	33	34	33
Total	Irrelevant	22	16	17	20	9	40	8	20	26	16
	Little importance	39	31	28	28	11	41	31	35	40	26
	Important	45	53	43	35	36	22	44	42	36	43
	Very important	21	21	26	29	39	20	38	17	21	31
	Essential	6	9	15	21	42	12	14	14	7	15
	Total	133	130	129	133	137	135	135	128	130	131

Legend: [1] Challenge; [2] Unpretentious/Humility; [3] Neutrality; [4] Liberal; [5] Regulation is possible; [6] Regulation is impossible; [7] Incremental progression; [8] Government obstacle/inefficient; [9] Waste of time/disbelief; [10] Culture.

Figure 5.8 Distribution of the respondents' classification of each need importance.



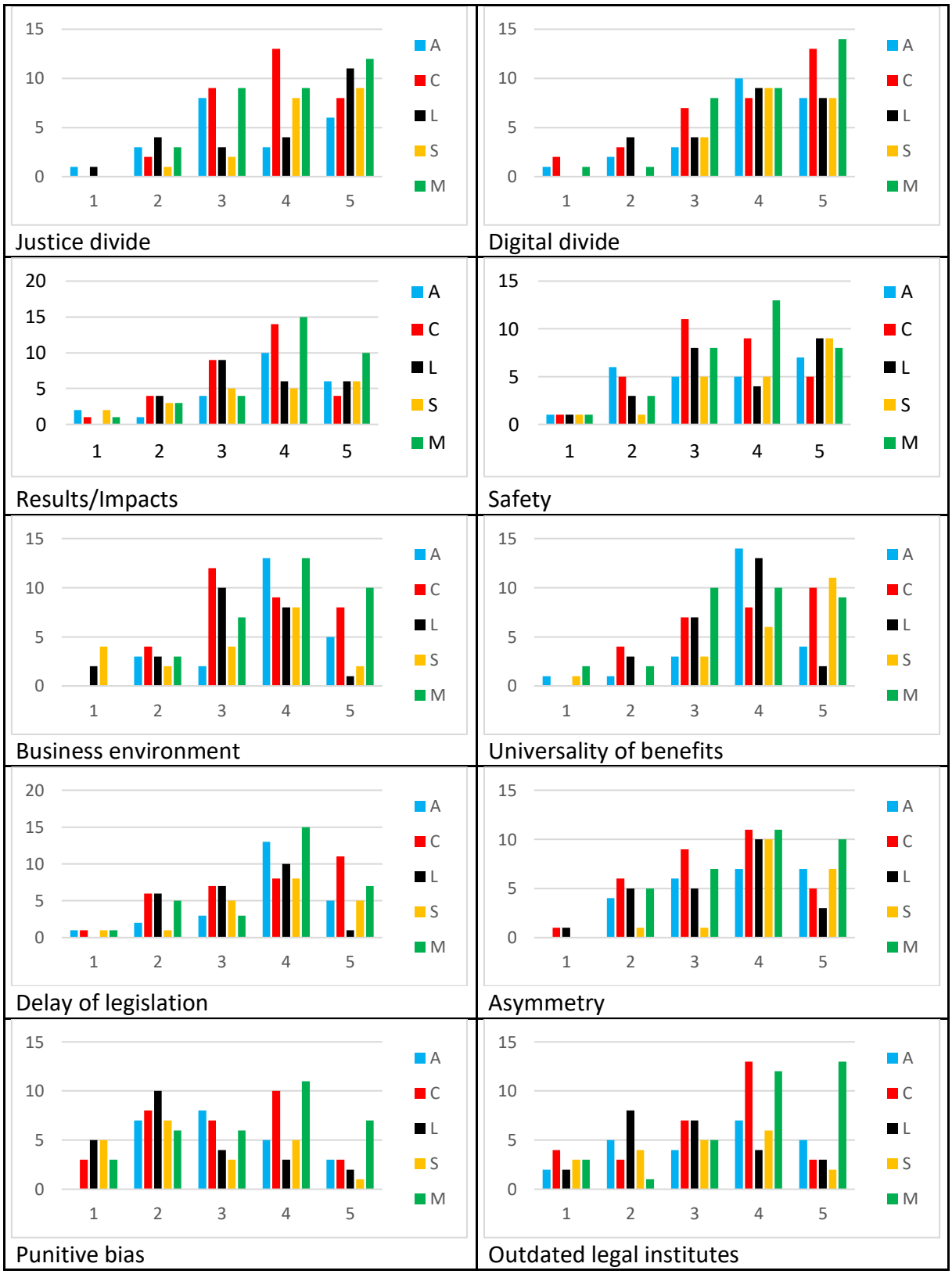
Note: (a) X-axis scale the degree of importance: [1] Irrelevant [2] Little importance [3] Important [4] Very important [5] Essential.

Table 5.11 Respondents' classification of each need importance

		Needs								
Area	Importance level	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
A	Irrelevant	1	3	1	1	2	1	4	1	1
	Little importance	1	3	3	4	2	5	3	1	2
	Important	5	6	3	8	6	7	6	3	7
	Very important	7	7	9	6	8	4	1	6	7
	Essential	10	4	8	4	5	5	7	12	7
	Total	24	23	24	23	23	22	21	23	24
C	Irrelevant		1	1		2	4	7	1	1
	Little importance	2	5	3	4	2	6	13	1	5
	Important	7	11	5	12	13	10	7	8	8
	Very important	12	6	13	12	13	10	5	13	17
	Essential	13	11	10	5	3	3	1	10	3
	Total	34	34	32	33	33	33	33	33	34
L	Irrelevant		1	3		3	1	1	1	
	Little importance	1	1	2	6	3	7	8	2	4
	Important	5	4	6	5	3	4	7	10	4
	Very important	8	5	4	7	6	6	5	6	7
	Essential	10	11	9	4	7	5	1	4	9
	Total	24	22	24	22	22	23	22	23	24
S	Irrelevant	1		1	3		1	1		
	Little importance	1	1		4		1	4	2	1
	Important	3	3	2	8	5	6	5	3	3
	Very important	6	6	7	3	6	3	6	5	6
	Essential	9	11	11	1	10	9	4	10	10
	Total	20	21	21	19	21	20	20	20	20
M	Irrelevant	1	4	3	5	2	4	7	1	3
	Little importance	2	4	5	3	5	7	6	3	3
	Important	4	4	5	12	12	8	10	5	9
	Very important	10	10	14	5	6	6	10	9	12
	Essential	17	12	7	8	9	6		16	5
	Total	34	34	34	33	34	31	33	34	32
Total	Irrelevant	3	9	9	9	9	11	20	4	5
	Little importance	7	14	13	21	12	26	34	9	15
	Important	24	28	21	45	39	35	35	29	31
	Very important	43	34	47	33	39	29	27	39	49
	Essential	59	49	45	22	34	28	13	52	34
	Total	136	134	135	130	133	129	129	133	134

Note: [1] Transparency; [2] Human dignity; [3] Diversity; [4] Adherence to society; [5] Social protection; [6] Government protagonist; [7] Nationalism; [8] Long-term planning; [9] Participation

Figure 5.9 Distribution of the respondents' classification of each concern's importance.



Note: (a) X-axis scale the degree of importance: [1] Irrelevant [2] Little importance [3] Important [4] Very important [5] Essential.

Table 5.12 Respondents' classification of each Concern's importance

		Concern									
Area	Importance Level	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
A	Irrelevant	1	1	2	1	-	1	1	-	-	2
	Little importance	3	2	1	6	3	1	2	4	7	5
	Important	8	3	4	5	2	3	3	6	8	4
	Very important	3	10	10	5	13	14	13	7	5	7
	Essential	6	8	6	7	5	4	5	7	3	5
	Total	21	24	23	24	23	23	24	24	23	23
C	Irrelevant	-	2	1	1	-	-	1	1	3	4
	Little importance	2	3	4	5	4	4	6	6	8	3
	Important	9	7	9	11	12	7	7	9	7	7
	Very important	13	8	14	9	9	8	8	11	10	13
	Essential	8	13	4	5	8	10	11	5	3	3
	Total	32	33	32	31	33	29	33	32	31	30
L	Irrelevant	1	-	-	1	2	-	-	1	5	2
	Little importance	4	4	4	3	3	3	6	5	10	8
	Important	3	4	9	8	10	7	7	5	4	7
	Very important	4	9	6	4	8	13	10	10	3	4
	Essential	11	8	6	9	1	2	1	3	2	3
	Total	23	25	25	25	24	25	24	24	24	24
S	Irrelevant	-	-	2	1	4	1	1	-	5	3
	Little importance	1	-	3	1	2	-	1	1	7	4
	Important	2	4	5	5	4	3	5	1	3	5
	Very important	8	9	5	5	8	6	8	10	5	6
	Essential	9	8	6	9	2	11	5	7	1	2
	Total	20	21	21	21	20	21	20	19	21	20
M	Irrelevant	-	1	1	1	-	2	1	-	3	3
	Little importance	3	1	3	3	3	2	5	5	6	1
	Important	9	8	4	8	7	10	3	7	6	5
	Very important	9	9	15	13	13	10	15	11	11	12
	Essential	12	14	10	8	10	9	7	10	7	13
	Total	33	33	33	33	33	33	31	33	33	34
Total	Irrelevant	2	4	6	5	6	4	4	2	16	14
	Little importance	13	10	15	18	15	10	20	21	38	21
	Important	31	26	31	37	35	30	25	28	28	28
	Very important	37	45	50	36	51	51	54	49	34	42
	Essential	46	51	32	38	26	36	29	32	16	26
	Total	129	136	134	134	133	131	132	132	132	131

Legend: [1] Justice divide; [2] Digital divide; [3] Results/Impacts; [4] Safety; [5] Business environment; [6] Universality of benefits; [7] Delay of legislation; [8] Asymmetry; [9] Punitive bias; [10] Outdated legal institutes

QDA showed that most independent variables (values, needs, and concerns) do not discriminate between academic areas.

Among the values (Figure 5.10 and Table 5.13), the belief that the government is an obstacle appeared with greater discriminant power, mainly in the Sociology area and a little less in the Law area. Both consider this value less important. The two areas also feature prominently in the incrementalism assessment, indicating a slightly lower assessment of importance to the value. The Sociology area appears again isolated, giving less importance to neutrality and the liberal value in which researchers with a multidisciplinary background, and not those from the Administration area, appear at the opposite end of the evaluation. The last value that appears slightly highlighted, perhaps, as expected, was that of the IS area regarding the assessment that it is possible to regulate ICT with a lower level of importance.

Figure 5.10 Radar chart of the QDA group means for Values as independent variables for each academic area

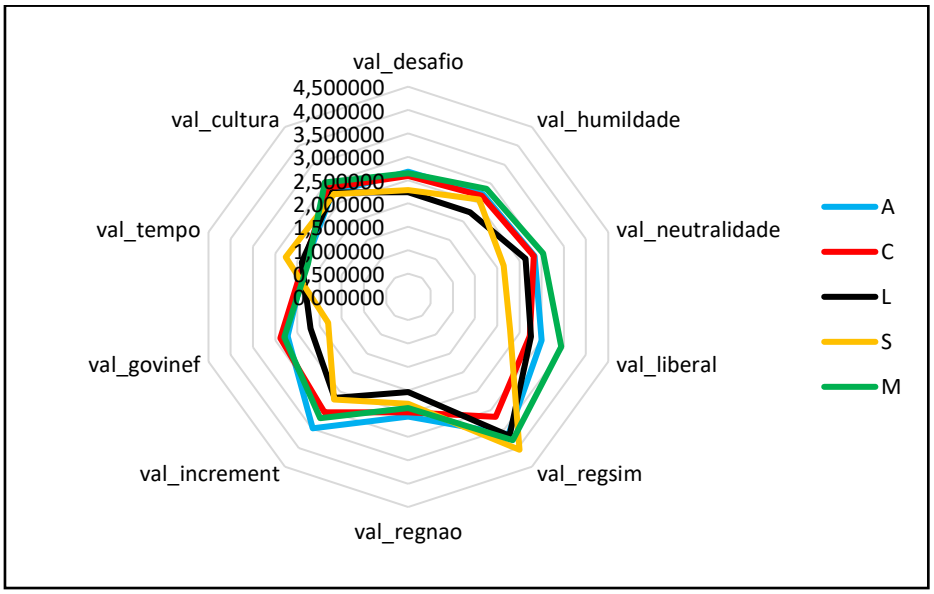


Table 5.13 QDA group means for Values as independent variables for each academic area

	Areas QDA Group means				
Value (Variable)	A	C	L	S	M
Challenge (val_desafio)	2,680000	2,588235	2,240000	2,285714	2,647059
Unpretentious/Humility (val_humildade)	2,720000	2,676471	2,240000	2,571429	2,852941
Neutrality (val_neutralidade)	2,840000	2,823529	2,640000	**2,142857**	3,029412
Liberal (val_liberal)	3,000000	2,735294	2,760000	**2,285714**	**3,441176**
Regulation is possible (val_regsim)	3,640000	**3,176471**	3,680000	4,047619	3,794118
Regulation is impossible (val_regnao)	2,560000	2,470588	2,040000	2,285714	2,382353
Incremental progression (val_increment)	3,480000	3,058824	**2,680000**	**2,714286**	3,205882

Value (Variable)	Areas QDA Group means A	C	L	S	M
Government obstacle/inefficient (val_govinef)	2,720000	2,882353	**2,200000**	**1,809524**	2,794118
Waste of time/disbelief (val_tempo)	2,320000	2,352941	2,400000	2,761905	2,264706
Culture (val_cultura)	2,760000	2,882353	2,760000	2,714286	3,029412

The Sociology area also discriminates more often than the other areas when assessing needs (Table 5.14), as illustrated in Figure 5.11. Social protection, diversity, respect for human dignity, and having the government as a protagonist were needs evaluated by the area with the highest degree of importance distinguishing from the other areas. On the other hand, when evaluating the need for adherence to society, the Sociology area stood out, evaluating it with a lower level of importance. The assessment of the Administration area for the need for human dignity stood out at the opposite extreme to that of the Sociology area, giving it a lower degree of importance. The Law area also appears with a slightly lower assessment of the need for long-term planning.

Figure 5.11 Radar chart of the QDA group means for Needs as independent variables for each academic area

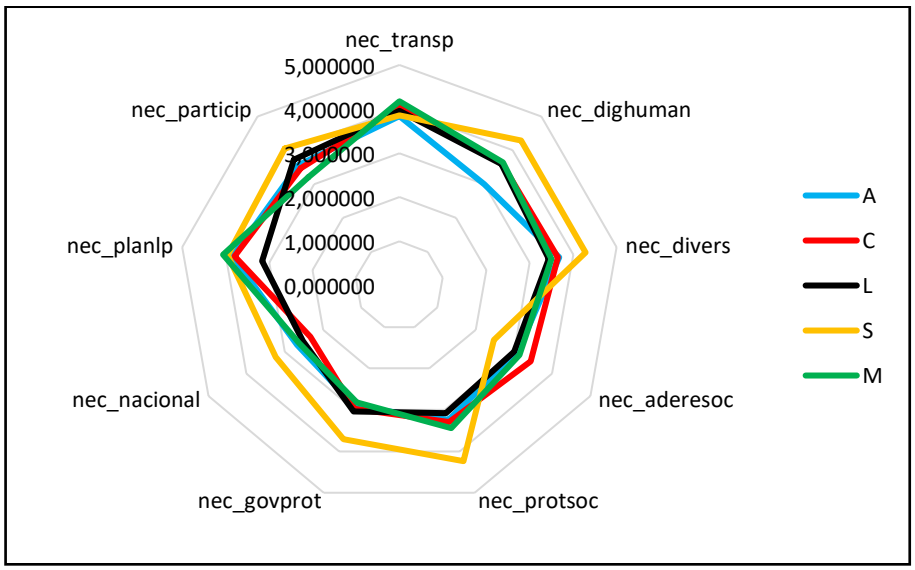


Table 5.14 QDA group means for Needs as independent variables for each academic area

Need (Variable)	Areas QDA Group means A	C	L	S	M
Transparency (nec_transp)	3,840000	4,058824	3,960000	3,857143	4,176471
Human dignity (nec_dighuman)	**3,000000**	3,617647	3,600000	**4,285714**	3,647059
Diversity (nec_divers)	3,680000	3,647059	3,440000	**4,285714**	3,500000
Adherence to society (nec_aderesoc)	3,080000	3,441176	3,000000	**2,476190**	3,147059

Need (Variable)	Areas QDA Group means A	C	L	S	M
Social protection (nec_protsoc)	3,240000	3,294118	3,080000	**4,238095**	3,441176
Government protagonist (nec_govprot)	2,920000	2,970588	3,040000	**3,714286**	2,823529
Nationalism (nec_nacional)	2,680000	2,323529	2,520000	3,238095	2,617647
Long-term planning (nec_planlp)	3,840000	3,794118	**3,160000**	3,952381	4,058824
Participation (nec_particip)	3,560000	3,470588	3,720000	4,047619	3,205882

Researchers with multidisciplinary backgrounds appeared with greater importance for the concern with the punitive bias and, mainly, for outdated legal institutes (Figure 5.12 and Table 5.15). The Sociology area detached again, giving greater importance to the concern with the universality of benefits. Once more, it appeared along with the Law area with a slightly lower assessment of importance for the business environment. The Administration area, in turn, gave less importance to the concern with access to justice.

Figure 5.12 Radar chart of the QDA group means for Concerns as independent variables for each academic area

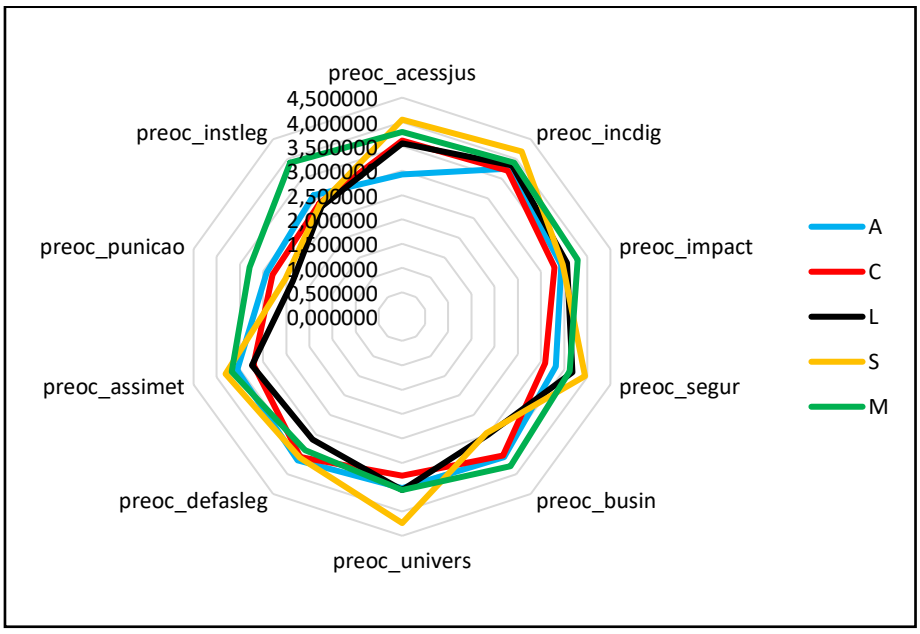


Table 5.15 QDA group means for Concerns as independent variables for each academic area

Concern (Variable)	Areas QDA Group means A	C	L	S	M
Justice divide (preoc_acessjus)	**2,920000**	3,617647	3,560000	4,047619	3,794118
Digital divide (preoc_incdig)	3,760000	3,705882	3,840000	4,190476	3,911765
Results/Impacts (preoc_impact)	3,440000	3,294118	3,560000	3,476190	3,794118
Safety (preoc_segur)	3,320000	3,088235	3,680000	3,952381	3,617647
Business environment (preoc_busin)	3,560000	3,529412	**3,000000**	**2,952381**	3,794118

	Areas QDA Group means				
Concern (Variable)	A	C	L	S	M
Universality of benefits (preoc_univers)	3,520000	3,264706	**3,560000**	4,238095	3,558824
Delay of legislation (preoc_defasleg)	3,640000	3,558824	3,120000	3,571429	3,382353
Asymmetry (preoc_assimet)	3,560000	3,205882	3,240000	3,809524	3,676471
Punitive bias (preoc_punicao)	2,920000	2,794118	2,360000	2,523810	**3,294118**
Outdated legal institutes (preoc_instleg)	3,080000	2,882353	2,800000	2,857143	**3,911765**

5.5 Discussion

The results objectively present points of agreement and differences between the grand areas of the Academy covered in the research (Administration, IS, Law, and Sociology) regarding the current problem of emerging ICT regulation. Through a discriminant analysis of a survey with 139 professors and researchers, we analyzed the experience and contribution to the discussion process, the perception of the difficulties pointed out in the literature review that regulators have to face, and the perception of values, needs, and concerns that represent the worldview of a sample of politicians and specialized bureaucrats from the executive and public prosecution service, who participated in the discussions and we interviewed in the previous phase of this research.

It is a pioneering study for a problem that is gaining the attention of IS Community (Gozman et al., 2019) and faces the difficulty of demanding a multidisciplinary approach in which the role of the IS area should be the protagonist (Beath et al., 2013, Riemer and Peter, 2021).

The sample of respondents minimally covered the study's areas of interest for the application of discriminant analysis. The few cases of public servants from the executive, legislative, judiciary, or prosecution service bodies who answered the questionnaire did not introduce significant bias in the responses compared to other respondents from the same academic area to which they belonged.

The result of the study exclusively portrays respondents with a positivist legal culture (civil law). The generational profile of the sample has a significant predominance of people who are not digital natives (83%). It is an acceptable result for a universe of professors and researchers nowadays, opening up the possibility of a change in results over the next 10 to 20 years.

Academic participation, in general, is small and very focused on reading the regulatory proposals presented in public consultations. The Sociology area, perhaps by tradition and due to the study profile being closer to the formulation and evaluation of public policies, was the only one that showed slightly greater participation and, naturally, together with the Law area, contributed more effectively with criticism, suggestions, participation in public hearings and advice to politicians, companies, multilateral organizations, including informally.

However, practical contributions were very few. This result contradicts the general importance given to the need for participation and the recognition of the possibility of regulating ICT. The discredit with Public Consultation instruments, fueled by restricted dissemination, very tight deadlines, and a negative experience regarding suggestions and criticisms overlooked in previous consultations, may be one of the reasons for the low effective participation in the discussions. It is worrying when one realizes that the IS area was the one that most considered its contributions not to be useful. This neglect feeling may justify a slightly lower assessment of the area for the possibility of regulating ICT, as well as explaining the greater importance given to the difficulty related to applying existing regulations.

In general, the respondents recognized the relevance of the difficulties in regulating ICT identified in the literature, except for the apocalyptic cinematographic vision of AI.

The exact alignment was observed with the need for transparency, respect for human dignity, diversity, and long-term planning, as well as with concerns about the justice divide, the digital divide, and the universality of benefits. This result is consistent with the discussion and production of policy standards and good practices for the development and ethical use of emergent ICT (e.g., IEEE, 2019; High-Level Expert Group on Artificial Intelligence, 2019). The exceptions with ratings with a slightly lower degree of importance were the need for nationalism and the concern about the punitive bias against innovations taken as possible sources of corruption. In the first case, the assessment reflects the disruptive effect of the internet and the globalized digital economy on the geographic concept of borders and sovereignty.

Most independent variables had no power to discriminate between the academic areas. However, some more clear differences that emerged in assessing difficulties in regulating ICT, values, needs, and concerns were surprising or challenging to explain.

It was the case with the assessment of minor importance with the difficulty of access to corporate data by the Administration area. The area stood out with a slightly lower rating for

the need to respect human dignity and concern for access to justice. One could imagine this result was related to an assessment of greater importance for the liberal value, but this was not confirmed. Respondents with a multidisciplinary background detached, considering the liberal value more important than the academics in the Administration area, while at the same time, the multidisciplinary group stood out for giving greater importance to the punitive bias.

Sociology and Law are distinguished from other areas by classifying incrementalism, government as an obstacle, and concern with the business environment with less importance. In the case of incrementalism, the result is surprising, as these areas value debates and social participation, especially the Sociology area, which is more in line with the incremental legislative tradition. The result may reflect a sense of urgency of regulation in the face of the perception of risks to values of respect for human dignity and diversity. It is consistent with the assessment of lesser importance in the field of Sociology for the neutrality of regulation and liberal values, as well as the same level of importance for the need to adhere to society and of more importance for the need for respect for human dignity, social protection, diversity and having the government as a protagonist in the process.

5.6 Conclusion

The research answers the call for studies (Gozman, Butler and Lyytinen, 2019; Aanestad et al., 2021) to bridge the gap between ethics and the problem of regulating ICT, contributing to the deepening of the analysis of the participation and the difference in researchers' perception of the problem in four grand areas of Academia (Administration, IS, Law, and Sociology), each of which grouping related academic areas.

The research showed that there are no significant differences between the areas. Notably, the IS area, which in the survey encompasses the areas of Informatics and Computer Science, Engineering, Mathematics, and Statistics, showed a very consistent alignment with most of the other areas for most of the questions evaluated.

It is impossible to generalize the results from the answers to some survey questions applied to a limited sample of professors and researchers such as the study. Even if it were applied to the academic areas individually, it is still inevitable that there is no homogeneity within the areas. The IS area is no exception to this reality as it has members who embrace different philosophical, methodological, and possibly worldview positions.

Despite not having the objective of generalizing the conclusions, the research contributes by objectively describing the differences in values, beliefs, and experiences of the grand academic areas in discussing the problems and proposals for regulating emerging ICT. It is a challenge that should count on the leadership of the IS area in the participation and contribution. However, the results indicate that this ideal is not observed in the Brazilian case.

The results show that, despite recognizing the importance of participation in the discussions, the IS area still has a minimal presence. This absence can have severe consequences for the technical effectiveness of the regulations that may be imposed, for the business environment's legal security, for the conduct of the IS professionals in the development of solutions, and the scientific development of the field.

We hope the research will also contribute to the academic topic concerning multidisciplinary, interdisciplinary, and transdisciplinary collaboration for scientific development.

In practical terms, the main implication of the research is to show legislators who have to face the difficulties in regulating emerging technologies the differences between the effective participation of different areas of Academia and to try to seek guidance and foster debates in such a way that these divergences have space, appear and contribute to the construction of collaborative and effective regulatory solutions.

Finally, the study's limitations and the results allow us to suggest some future research topics: the replication of the research in countries with a common-law system to determine whether the legal culture of the respondent influence the differences between the academic areas; longitudinal studies that can reach higher levels of digital native respondents and compare the evolution of the differences; studies that include other academic areas like medicine, biology, psychology; and observational research for an in-depth analysis on the participation in public consulting and the overlooked contributions.

6 CONCLUSION

This research aimed to add knowledge about the difficulties in regulating disruptive technologies. It is a current, complex, and socially and economically relevant problem. The purpose was an in-depth study taking the protagonists in the regulation process: politicians and specialized bureaucrats who participated in legislative or regulatory proposals discussions.

The way to answer the research question was to raise the recent and qualified scientific literature that dealt with the topic, explore documents produced in the political environment in which the problem is discussed, interview protagonists in the process, and listen to the opinion of the academy on some of the research findings.

The three articles that structure the thesis followed this path, whose individual theoretical and methodological contributions, limitations, and suggestions for future research are summarized in the Contribution Matrix of Mooring (Costa et al., 2019) in Table 6.1.

The first step of reviewing the literature on the regulation of emerging ICT encountered an obstacle that underlies the research problem: sharing knowledge based on multidisciplinary contribution.

The first article detailed the steps of the systematic literature review whose final result, regardless of the methodological careful with all steps, failed to bring the contribution of an essential field when dealing with a theme of regulation that is the Law field. It happened due to the difference between the scientific production culture and area qualification criteria.

From this conclusion, the difference became another guiding element of the whole thesis. Differences in legal systems, levels of administration, and groups of actors. Differences in gender, race, academic background, and political wing. Differences in perception about the difficulties, interests, strategies, argumentation and bargaining power, and worldview. Differences of experience with discussions and contributions about the problem and perception of different academic areas regarding values and beliefs on the needs and concerns.

Table 6.1 Contribution Matrix of Mooring

RESEARCH CENTRAL QUESTION What are the regulators' difficulties in regulating disruptive technologies?			
GENERAL OBJECTIVE Understand legislators' difficulties in regulating disruptive technologies and how they overcome them, primarily through the participation of different fields of Academia.			
Summary of results	Study		
	1	2	3
Contributions to the advancement of knowledge	Scope review of the ICT regulation problem: significant influence from the philosophy field; Luciano Floridi and Jürgen Habermas most used theoretical lens; regulators' challenges in regulating ICT classified into six groups (Technical issues, Legal issues, Drivers, Environment issues, Societal objectives, and Individual behavior or trace) which are possible levels of analysis and expand the classification of regulatory challenges proposed by Eggers & Turley (2018) and OECD (2019).	Bridge the IS and Law fields by filling the gap in regulating emerging ICT in an empirical study in a developing country with a civil-law system; the study on multiple levels of public administration; focus on regulators as the primary data source; the case of a country with a high risk of regulatory capture due to historical corruption, turbulent political environment, and high polarization in society with a right-wing wave; integration of Habermas TCA with another theoretical framework; reveal covert and new groups of actors in the ICT regulation environment; regulators' beliefs as values, needs, and concerns about ICT regulation; critical analysis of the general difficulties of the political environment and those related to emerging ICT discussions; the ideal ICT regulation process advocated by the executive branch specialists.	Bridge the gap between ethics and the problem of regulating ICT; Objectively describes the differences in values, beliefs, and experiences of four grand academic areas (Administration, IS, Law, and Sociology) in discussing the problems and proposals for regulating emerging ICT; general few participation and contribution, especially from the IS area due to possible discredit with Public Consultation instruments.
Contributions to methodological advancement	IS and Business Management fields commonly used SLR guidelines are unsuitable for integrating with law scholars. Practical advice for those planning to integrate their literature review with the Law field.	Use of meetings and public hearings video recordings as an exploratory source for a photo-diary interview approach (Latham, 2003); Myers and Newman's (2007) face-to-face dramaturgical interview model adjusted to a videoconferencing platform; description of steps and difficulties for an "elite" interview; the Participant Information Sheet and the Participant Consent Form adjusted to a non-anonymized "elite" interview and Personal Data Protection Law.	Research instrument with questions based on some of the difficulties in regulating ICT raised in the literature review and the previous qualitative stage, which captured the perception of the worldview of parliamentarians, their direct assistants, and technocrats from the executive branch and prosecution service.
Limitations	Not consult a group of academics in the law field to confirm and improve the hand-search sources.	The Covid-19 pandemic hindered the number of interviewees; the bias of lack of legislative representation of blacks or browns and women; the reserved behavior of legislative assistants from specialized centers; the non-	Respondents with a positivist legal culture (civil law); digital natives are still uncovered;

		inclusion of academics and specialist professionals, representatives of companies or business associations, labor unions and associations of new workers, and organizations of civil society in the universe of interviewees.	
Proposal for future studies	The side effects or unintended outcomes of national ICT policy in developing countries and the role of BigTech companies; ethical challenges of health data privacy in biomedical Big Data applications, and the risk of the "whiplash effect" (Mittelstadt & Floridi, 2016) of legislation; the effect of the health monitoring artifacts on the public health care system; the risk of paternalism by regulators and identify true values important to the various stakeholders; legal enforcement mechanisms and civil and criminal liability of autonomous agents in IS-Law field collaboration; Individual aspects of decision-making and the political environment in the face of regulatory "Drivers"; and the ontological differences of the ICT regulation problem between the academic fields.	Interview with other groups of actors; Big Tech companies and Startups' strategies through the participation and contributions in Public Hearings and Consultations; differences between academic fields about the participation, contribution in the discussions concerning ICT regulation, and the perception about regulators' worldview; the academic preparation of prosecutors and judges; the role of parliamentary assistants with social media and fake news; parliamentary assistants and the intermediate level of executive personnel as a gateway to corporate lobbying; lobbying strategies mediated by social media platforms algorithms; and longitudinal studies that accompany the entire process of a theme or legislative initiative.	The influence of the legal culture (common-law x civil-law system) on the differences between the academic areas; longitudinal studies that can reach higher levels of digital native respondents and compare the evolution of the differences; inclusion of other academic areas; the participation in public consulting and the overlooked contributions.
Integrating Conclusion	There are regulatory difficulties that are typical of disruptive technologies, whose strategic actors are legislative assistants and mid-level bureaucrats from the executive branch. There are more convergences than divergences between the four grand areas of the Academy researched. However, in general, there is little participation and contribution to the discussions, which in the case of the IS area is even more severe for the regulations to be technically effective. Part of this result can be attributed to the discredit of institutional instruments of participation and the difficulty of integrating the areas of IS and Law due to the distinct culture of production and qualification of academic works.		

Despite the frustration, the literature review allowed us to identify Habermas' Theory of Communicative Action as an alternative theoretical lens that proved to be adequate to study the problem in the second article, giving the research a critical philosophical perspective. Therefore, allowing the researcher to leave neutrality and take a value position to reveal and challenge prevailing beliefs and social practices, aiming at the emancipation of individuals and societal improvements (Myers & Klein, 2011).

Furthermore, the difficulties in regulating emerging ICT identified and classified in the literature review served as provisional coding in the exploratory stage of the second article and as a background for the interviews. These difficulties were also used in the third article to capture the perception of researchers in the survey. The result validates the literature review finding and identifies the assessment differences between the researched academic areas.

After completing the literature review and defining the theoretical lens, we moved on to the methodological design of an in-depth study of the problem. We started by exploring the political environment at the three levels of the Brazilian government. In addition to the federal government, we selected the State of São Paulo and the municipality of São Paulo and found a wealth of material produced by the Science and Technology Committees of the respective legislative houses. In the municipality's case, the inexistence of specific Science and Technology Committees forced the selection of a Committee whose purpose seemed to be the most adequate for the study. This absence, added to the lack of discussion on the use of cameras for facial recognition in the State Committee, indicates that these levels of government are more oblivious to technological evolution and more susceptible to the action of interest groups.

The exploratory document analysis was fundamental for the selection, negotiations with the gatekeepers, and the conduction of the interviews.

If, on the one hand, the pandemic prevented face-to-face interviews from being carried out as initially planned, on the other hand, video conferencing platforms were revealed as a reliable means, accepted by the interviewees, and flexible for the researcher. This methodological revelation promotes a disruption in the geographic limits for qualitative research that use an interview as a data source. For example, this same research on the Brazilian political context could be converted into a cross-country study to compare the results of a common-law system country.

Among all the research stages, the most difficult was the qualitative analysis of the interviews, trying to identify the TAC concepts in the interviewees' speeches. Using a policy study framework helped analyze aspects of the rational-instrumental reasoning domain, delimiting the boundary with the Lifeworld domain and identifying colonization strategies. This separation and the coding strategy of Values coding and Versus coding made it possible to identify values and beliefs in the interviewees' speeches, which were used in the third article to describe the differences in perception between the research areas.

In this way, the three articles are interconnected to answer the research question. Among all the difficulties inherent to the regulation of disruptive technologies identified in the second article, multidisciplinary collaboration, so common in the final considerations of scientific articles, was the one that received the most attention in the research.

In addition to the difficulty observed in the literature review, it is worrying the lack of participation of the Academy, fueled in part by a typical distance from political and legal discussions and possibly by a discredit in institutional instruments of participation: public hearings and public consultations.

It raises concern about the role different areas of the Academy need to play in sharing knowledge so that differences in perceptions about the problem are known and taken into account and enlighten the population and regulators. Especially in the case of the IS area, this distance compromises the effectiveness of the proposed regulations, contributing to the insecurity of the business environment and increasing economic, social and fundamental human rights losses.

Finally, we hope the research has effects on non-participants and non-respondents. We expected that the more than forty parliamentarians contacted and who did not accept to participate in the interviews realize that their role in the committees discussing disruptive technologies is relevant and alerted to the Academy's gaze. In the same way, we hope that the survey has aroused the curiosity of more than 2.500 researchers from the best-qualified courses in the researched areas who did not answer the questionnaire. Moreover, we expect that the research encourages them to contribute academically and in practice to construct the necessary regulations that do not hinder innovation and economic development but respect human dignity and protect the rights of all those affected.

It is possible to imagine that each citizen will soon be able to debate any matter directly with parliamentarians in a universe of parallel reality, as in a game. Moreover, the interactions

of each citizen in this universe are stored and processed by some artificial intelligence algorithm to offer parliamentarians the most accurate diagnosis of society's problems and help them make the best public policy decision. Still, the digitally excluded and those unable to pay will remain non-existent as data. A condition not imagined in Habermas's idealization of society.

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APPENDIX A Top Ten Journals Ranked in JCR, SJR, and Google Scholar Databases in Categories Related to Ethics and Legal Aspects

Title	H Index	Country	Source[(a)]	Category	Rank
American Journal of Bioethics	54	United States	JCR	Ethics	1
			SJR	Issues, Ethics and Legal Aspects	2
Applied Energy	162	United Kingdom	SJR	Management, Monitoring, Policy and Law	3
Berkeley Technology Law Journal		United States	GS	Technology Law	2
BMC Medical Ethics	35	United Kingdom	JCR	Ethics	5
			SJR	Issues, Ethics and Legal Aspects	1
Business & Society	64	United States	GS	Ethics	2
Business Ethics Quarterly	64	United Kingdom	GS	Ethics	7
			JCR	Ethics	4
Business Ethics: A European Review		United Kingdom	GS	Ethics	5
			JCR	Ethics	3
Business Strategy and the Environment	84	United States	SJR	Management, Monitoring, Policy and Law	9
California Law Review		United States	GS	Law	9
			JCR	Law	8
Cambridge Quarterly of Healthcare Ethics	33	United Kingdom	SJR	Issues, Ethics and Legal Aspects	10
Columbia Journal of Law & the Arts		United States	GS	Technology Law	10
Columbia Law Review	60	United States	GS	Law	3
Common Market Law Review	43	Netherlands	GS	European Law	2
			JCR	Law	4
Computer Law & Security Review	28	United Kingdom	GS	Technology Law	1
Corporate Social Responsibility and Environmental Management	58	United States	GS	Ethics	3
Criminology	122	United States	SJR	Law	3
Economic Policy	67	United Kingdom	SJR	Management, Monitoring, Policy and Law	2
Ecosystem Services	46	Netherlands	SJR	Management, Monitoring, Policy and Law	10
Environmental Values	41	United Kingdom	GS	Ethics	9
Ethics	65	United States	GS	Ethics	8
			JCR	Ethics	10
Ethics and Information Technology	41	Netherlands	JCR	Ethics	7
European Business Organization Law Review	18	Netherlands	GS	European Law	7

Title	H Index	Country	Source[a]	Category	Rank
European Constitutional Law Review	21	United Kingdom	GS	European Law	5
European Journal of Psychology Applied to Legal Context	15	Spain	JCR	Law	6
European Journal of Risk Regulation	14	Germany	GS	European Law	9
European Law Journal	48	United Kingdom	GS	European Law	1
European Law Review	17	United Kingdom	GS	European Law	6
Fish and Fisheries	91	United Kingdom	SJR	Management, Monitoring, Policy and Law	4
Georgetown Law Journal	42	United States	GS	Law	5
			JCR	Law	7
German Law Journal		Germany	GS	European Law	3
Global Environmental Change	147	Netherlands	SJR	Management, Monitoring, Policy and Law	1
Harvard Law Review	73	United States	GS	Law	2
			JCR	Law	3
IIC-International Review of Intellectual Property and Competition Law	13	Germany	GS	Technology Law	8
International Data Privacy Law		United Kingdom	GS	Technology Law	3
International Journal of Constitutional Law	27	United Kingdom	GS	European Law	4
International Journal of Project Management	121	United Kingdom	SJR	Management, Monitoring, Policy and Law	8
International Organization	133	United Kingdom	SJR	Law	1
International Security	97	United States	SJR	Law	2
Iowa Law Review	29	United States	GS	Law	10
Journal of Aging Studies	55	United Kingdom	SJR	Issues, Ethics and Legal Aspects	5
Journal of Applied Philosophy	26	United States	GS	Ethics	10
Journal of Business Ethics	147	Netherlands	GS	Ethics	1
			JCR	Ethics	2
Journal of Criminal Justice	64	United Kingdom	SJR	Law	7
Journal of Environmental Economics and Management	105	United States	SJR	Management, Monitoring, Policy and Law	7
Journal of European Competition Law & Practice		United Kingdom	GS	European Law	8
Journal of Experimental Criminology	41	Germany	SJR	Law	9
Journal of Law and the Biosciences	1	United Kingdom	JCR	Ethics	6

Title	H Index	Country	Source[a]	Category	Rank
Journal of Medical Ethics	65	United Kingdom	JCR	Ethics	9
			SJR	Issues, Ethics and Legal Aspects	3
Journal of Quantitative Criminology	72	Netherlands	SJR	Law	5
Journal on Telecommunications & High Technology Law		United States	GS	Technology Law	9
Justice Quarterly	77	United Kingdom	SJR	Law	8
Legal Medicine	39	Netherlands	SJR	Issues, Ethics and Legal Aspects	8
Maastricht Journal of European and Comparative Law		Switzerland	GS	European Law	10
MICHIGAN LAW REVIEW	46	United States	JCR	Law	9
Minnesota Journal of Law, Science & Technology		United States	GS	Technology Law	4
New Genetics and Society	30	United Kingdom	SJR	Issues, Ethics and Legal Aspects	9
Nursing Ethics	50	United States	SJR	Issues, Ethics and Legal Aspects	4
Pharmaceutical Patent Analyst	13	United Kingdom	GS	Technology Law	7
Police Quarterly	42	United States	SJR	Law	10
Public Health Ethics	18	United Kingdom	SJR	Issues, Ethics and Legal Aspects	7
Regulation & Governance	35	United Kingdom	JCR	Law	10
Review of Environmental Economics and Policy	42	United States	SJR	Management, Monitoring, Policy and Law	5
Science and Engineering Ethics	43	Netherlands	GS	Ethics	4
			JCR	Ethics	8
			SJR	Issues, Ethics and Legal Aspects	6
Social Responsibility Journal	23	United Kingdom	GS	Ethics	6
Stanford Law Review	62	United States	GS	Law	4
			JCR	Law	5
			SJR	Law	4
Texas Law Review	43	United States	GS	Law	8
University of Chicago Law Review	50	United States	GS	Law	7
University of Pennsylvania Law Review	53	United States	GS	Law	6
			JCR	Law	1
Vanderbilt Journal of Entertainment and Technology Law		United States	GS	Technology Law	5

Title	H Index	Country	Source[(a)]	Category	Rank
Weather and Climate Extremes	21	Netherlands	SJR	Management, Monitoring, Policy and Law	6
World Patent Information	27	United Kingdom	GS	Technology Law	6
Yale Law Journal	70	United States	GS	Law	1
			JCR	Law	2
			SJR	Law	6

Source: (a) GS: Google Scholar. Metrics. Top Publications. Categories: Social Sciences. Subcategories: Ethics; European Law; Law; Technology Law. Available in https://scholar.google.com.br/citations?view_op=top_venues&hl=pt-BR&vq=soc. Consulted on 6th Oct. 2019.
JCR: JCR Clarivets Web of Science. InCites Journal Citation Reports. Journals by Rank. 2018. Selected Categories – Ethics; Law. Available in https://jcr.clarivate.com/JCRJournalHomeAction.action? Consulted on 6th Oct. 2019.
SJR: Scimago Journal & Country Rank. Journal Ranks. Categories: Issues, Ethics and Legal Aspects; Law; Management, Monitoring, Policy and Law. Available in https://www.scimagojr.com/journalrank.php. Consulted on 6th Oct. 2019.

APPENDIX B Final Sample of Primary Qualified Literature

	Reference	Year	Journal	SJR[a]	H index[a]	Google h5[b]	Citation[c]	Average /year
1	(Mittelstadt & Floridi, 2016) The Ethics of Big Data: Current and Foreseeable Issues in Biomedical Contexts	2016	Science and Engineering Ethics	0,754	43	36	229	57,25
2	(Calo, 2015) Robotics and the Lessons of Cyberlaw	2015	California Law Review	1,735	48	30	248	49,60
3	(Cath et al., 2018) Artificial Intelligence and the 'Good Society': the US, EU, and UK approach	2018	Science and Engineering Ethics	0,754	43	36	86	43,00
4	(Mingers & Walsham, 2010) Toward Ethical Information Systems	2010	MIS Quarterly	4,212	195	72	216	21,60
5	(Stahl et al., 2014) From computer ethics to responsible research and innovation in ICT: The transition of reference discourses informing ethics-related research in information systems	2014	Information and Management	1,727	142	62	88	14,67
6	(Winfield & Jirotka, 2018) Ethical governance is essential to building trust in robotics and artificial intelligence systems	2018	Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences	0,948	143	59	28	14,00
7	(Stahl & Coeckelbergh, 2016) Ethics of healthcare robotics: Towards responsible research and innovation	2016	Robotics and Autonomous Systems	0,831	100	49	56	14,00
8	(Nemitz, 2018) Constitutional democracy and technology in the age of artificial intelligence	2018	Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences	0,948	143	59	24	12,00
9	(Novitzky et al., 2015) A Review of Contemporary Work on the Ethics of Ambient Assisted Living Technologies for People with Dementia	2015	Science and Engineering Ethics	0,754	43	36	59	11,80
10	(Stahl et al., 2012) Information security policies in the UK healthcare sector: A critical evaluation	2012	Information Systems Journal	2,319	79	39	72	9,00

	Reference	Year	Journal	SJR[a]	H index[a]	Google h5[b]	Citation[c]	Average /year
11	(Hacker, 2018) Teaching fairness to artificial intelligence: Existing and novel strategies against algorithmic discrimination under EU law	2018	Common Market Law Review	1,606	43	25	16	8,00
12	(Wu, 2014) Protecting personal data in E-government: A cross-country study	2014	Government Information Quarterly	1,408	84	58	38	6,33
13	(Floridi, 2018) Soft ethics, the governance of the digital and the General Data Protection Regulation	2018	Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences	0,948	143	59	12	6,00
14	(Weng et al., 2015) Intersection of "Tokku" Special Zone, Robots, and the Law: A Case Study on Legal Impacts to Humanoid Robots	2015	International Journal of Social Robotics	0,593	38	36	28	5,60
15	(Wasilow & Thorpe, 2019) Artificial intelligence, robotics, ethics, and the military: A Canadian perspective	2019	AI Magazine	0,577	66	25	5	5,00
16	(Benvenisti, 2018) Upholding democracy amid the challenges of new technology: What role for the law of global governance	2018	European Journal of International Law	1,014	52	25	9	4,50
17	(Barclay, 2014) Using Frugal Innovations to Support Cybercrime Legislations in Small Developing States: Introducing the Cyber-Legislation Development and Implementation Process Model (CyberLeg-DPM)	2014	Information Technology for Development	0,559	29	26	24	4,00
18	(Zhou & Piramuthu, 2013) Technology Regulation Policy for Business Ethics: An Example of RFID in Supply Chain Management	2013	Journal of Business Ethics	1,86	147	98	22	3,14
19	(Liu, 2014) International standards in flux: A balkanized ICT standard-setting paradigm and its implications for the WTO	2014	Journal of International Economic Law	1,099	44	21	15	2,50

	Reference	Year	Journal	SJR[a]	H index[a]	Google h5[b]	Citation[c]	Average /year
20	(Cohen-Almagor, 2012) Freedom of Expression, Internet Responsibility, and Business Ethics: The Yahoo! Saga and Its Implications	2012	Journal of Business Ethics	1,86	147	98	18	2,25
21	(Pagallo, 2012) Cracking down on autonomy: Three challenges to design in IT Law	2012	Ethics and Information Technology	0,591	41	22	17	2,13
22	(Relly & Schwalbe, 2016) How business lobby networks shaped the US Freedom of Information Act: An examination of 60 years of congressional testimony	2016	Government Information Quarterly	1,408	84	58	8	2,00
23	(Scholl & Bolívar, 2019) Regulation as both enabler of technology use and global competitive tool: The Gibraltar case	2019	Government Information Quarterly	1,408	84	58	2	2,00
24	(Sokolovska & Kocarev, 2018) Integrating Technical and Legal Concepts of Privacy	2018	IEEE Access	0,609	56	89	4	2,00
25	(Schlagwein et al., 2019) Ethical norms and issues in crowdsourcing practices: A Habermasian analysis	2019	Information Systems Journal	2,319	79	39	2	2,00
26	(Schuelke-Leech et al., 2019) Regulating autonomy: An Assessment of Policy Language for Highly Automated Vehicles	2019	Review of Policy Research	0,698	40	20	2	2,00
27	(Taylor, 2017) The next stage of U.S. communications policy: The emerging embedded infosphere	2017	Telecommunications Policy	0,753	60	36	5	1,67
28	(Mahieu et al., 2018) From dignity to security protocols: a scientometric analysis of digital ethics	2018	Ethics and Information Technology	0,591	41	22	3	1,50
29	(Charlesworth, 2012) Data Protection, Freedom Of Information And Ethical Review Committees: Policies, practicalities and dilemmas	2012	Information Communication and Society	3,211	59	59	12	1,50
30	(Pagallo, 2018) Apples, oranges, robots: Four misunderstandings in today's debate on the legal status of AI systems	2018	Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences	0,948	143	59	3	1,50

	Reference	Year	Journal	SJR[a]	H index[a]	Google h5[b]	Citation[c]	Average /year
31	(Vidgen et al., 2019) Exploring the ethical implications of business analytics with a business ethics canvas	2019	European Journal of Operational Research	2,205	226	92	1	1,00
32	(Pagallo, 2015) The Realignment of the Sources of the Law and their Meaning in an Information Society	2015	Philosophy and Technology	0,618	16	22	5	1,00
33	(Woolley, 2019) Trust and Justice in Big Data Analytics: Bringing the Philosophical Literature on Trust to Bear on the Ethics of Consent	2019	Philosophy and Technology	0,618	16	22	1	1,00
34	(Vogelsang, 2017) Regulatory inertia versus ICT dynamics: The case of product innovations	2017	Telecommunications Policy	0,753	60	36	3	1,00
35	(Fisher & Harindranath, 2004) Regulation as a barrier to electronic commerce in Europe: The case of the European fund management industry	2004	European Journal of Information Systems	2,036	96	43	12	0,75
36	(Dainow, 2013) What can a medieval friar teach us about the internet: Deriving criteria of justice for cyberlaw from thomist natural law theory	2013	Philosophy and Technology	0,618	16	22	2	0,29
37	(North-Samardzic, 2019) Biometric Technology and Ethics: Beyond Security Applications	2019	Journal of Business Ethics	1,86	147	98	0	-
38	(Winfield et al., 2019) Machine ethics: The design and governance of ethical ai and autonomous systems	2019	Proceedings of the IEEE				3	3,00
39	(MacAk, 2016) Is the international law of cyber security in crisis:	2016	International Conference on Cyber Conflict, CYCON				6	1,50
40	(Kunyenje & Chigona, 2017) External Actors' Influence on National ICT Policy in Developing Countries: A Literature Review	2017	African Conference on Information Systems & Technolog				4	1,33
41	(Lubin, 2018) Cyber law and espionage law as communicating vessels	2018	International Conference on Cyber Conflict, CYCON				2	1,00

Source: by the author based on (a) SJR 2018 and H Index 2018: Scimago Journal & Country Rank. Journal Ranks. Available in https://www.scimagojr.com/journalrank.php. Access on Oct. 2019, (b) Google h5 Index: Google Scholar. Metrics. Available in https://scholar.google.com.br/citations?view_op=top_venues&hl=pt-BR&vq=soc. Access on Oct. 2019, and (c) Citation: Google Scholar. Available in https://scholar.google.com.br/. Access on Oct. 2019.

APPENDIX C Participant Information Sheet Model

ICT Regulation Process: Habermas meets the Multiple Streams Framework

FOLHA DE INFORMAÇÃO AO PARTICIPANTE

Versão 3.0 Data: 06/11/2020

Gostaríamos de convidá-lo a participar de uma pesquisa científica. Antes de decidir, é importante que entenda por que a pesquisa está sendo feita e o que ela envolverá. Por favor, avalie cuidadosamente se deseja participar. Leia essas informações com cuidado e discuta-as com assessores, amigos, família, se desejar. Se houver algo que não entenda, ou se quiser mais informações, por favor, pergunte-nos.

1. ***Qual é o propósito da pesquisa?***

O propósito da pesquisa é conhecer e analisar o processo de regulação de novas tecnologias de informação e comunicação no Brasil. As perguntas que esta pesquisa pretende responder são: como funciona o processo de regulação de novas tecnologias no Brasil, quais são as dificuldades, como os reguladores tentam superá-las, especialmente a assimetria do conhecimento e do poder de convencimento e de negociação de diferentes interesses.
Os objetivos são: identificar os atores; descrever o processo regulatório em todos os níveis de administração; identificar e investigar possíveis razões para as dificuldades e as estratégias adotadas para superá-las; e identificar e investigar a eficácia dos canais de comunicação com a Academia.
O problema da pesquisa é atual e relevante tanto para o ambiente de negócios quanto para a sociedade. O processo regulatório pode se tornar um obstáculo competitivo para um país com um sistema de direito civil, administração com múltiplos níveis e uma distribuição complexa do poder regulatório, como é o caso do Brasil.

2. ***Por que fui convidado para participar?***

Você foi convidado porque é membro da [Comissão de Ciência e Tecnologia, Comunicação e Informática – CCTCI da Câmara de Deputados/Comissão Especial da Câmara de Deputados, destinada a proferir parecer ao Projeto de Lei nº 2.303, de 2015, envolvendo moedas virtuais/Comissão de Ciência, Tecnologia, Inovação, Comunicação e Informática do Senado Federal/Comissão de Ciência, Tecnologia, Inovação e Informação da Assembleia Legislativa do Estado de São Paulo/Comissão de Trânsito, Transporte e Atividade Econômica da Câmara de Vereadores do município de São Paulo], ou era membro em 2019. Nós iremos recrutar até 8/5/2/8/4 membros da Comissão para entrevista.

3. ***Eu tenho que participar?***

Não. Descreveremos o estudo e você pode fazer quaisquer perguntas sobre a pesquisa antes de decidir se quer ou não participar. Se concordar em participar, pediremos que assine um termo de consentimento e lhe daremos uma cópia para guardar. No entanto, você ainda estará livre para se retirar do estudo, sem dar uma razão e sem punição ou constrangimentos, bastando comunicar ao pesquisador esta decisão. O prazo para você revogar o consentimento e requerer para retirar qualquer informação que você tenha contribuído para a pesquisa vai até submissão da tese para a defesa, prevista em fevereiro de 2022. Mais adiante explicaremos o que acontecerá com os dados coletados até o eventual ponto de retirada.

4. ***O que vai acontecer comigo se eu participar da pesquisa?***

Você será convidado a participar de uma entrevista, que será realizada por meio de uma plataforma de vídeo conferência de sua preferência, como Zoom (https://zoom.us/), Microsoft Teams (https://www.microsoft.com/pt-br/microsoft-365/microsoft-teams/free) ou Google Meet (https://meet.google.com/). Será uma entrevista individual, com uma duração mínima estimada de trinta minutos.

A entrevista será semiestruturada, ou seja, contará com um roteiro básico de temas e questões chave, que será encaminhado para o entrevistado antes da data agendada. Porém, será um roteiro flexível, cabendo mais ao entrevistado, como protagonista, decidir os aspectos de sua experiência que são mais relevantes aprofundar.

Se o entrevistado concordar, a entrevista será gravada, pelo menos o áudio, para auxiliar o pesquisador a se concentrar no conteúdo das respostas, tornando o processo de coleta das impressões do entrevistado mais fidedigno. O termo de consentimento assinado deverá ser encaminhado até a data agendada da entrevista.

Haverá três momentos durante a entrevista. O primeiro, que não será gravado, para um bate-papo de apresentação e para tirar alguma dúvida remanescente sobre a pesquisa. A partir do momento que o entrevistado se sinta confortável, iniciaremos a gravação e a entrevista propriamente dita. A expectativa é que essa etapa dure entre 30 e 40 minutos. Você poderá pedir para pausar ou parar a gravação a qualquer momento. Uma vez encerrada, a gravação será interrompida e retomaremos o ambiente informal para troca de impressões, esclarecimentos sobre os encaminhamentos, e agradecimentos.

A gravação da entrevista será transcrita de forma “não naturalista”, que privilegia o discurso verbal por meio da omissão de elementos tais como gaguez, pausas, vocalizações involuntárias e linguagem não-verbal, além da correção de erros da oralidade (Azevedo et al., 2017). Será encaminhada para conferência e comentários do entrevistado, que poderá também apresentar por escrito informações adicionais ou esclarecimentos sobre qualquer ponto tratado na entrevista.

5. ***Existem riscos potenciais em participar?***

O único risco em tomar parte da pesquisa seria a quebra de confidencialidade com a exposição de alguma informação que o entrevistado não quer ver revelada. Para reduzir o risco potencial, os dados serão mantidos pelo investigador em unidade de armazenamento local e backup em nuvem (OneDrive), com acesso exclusivo pelo mesmo, e protegidos por criptografia.

Por se tratar de entrevista com participante do tipo “elite”[10] , em que o número de membros em cada comissão é reduzido, os dados demográficos (gênero, raça, faixa etária, formação acadêmica, e posição ideológica do partido), os traços característicos do discurso, e a própria imagem inviabilizam que se ofereça a anonimização como uma alternativa de mitigação do risco. O máximo que se pode oferecer ao participante é a pseudonimização ou a análise dos dados de forma agregada, sem citação direta ou por pseudônimo.

6. ***Existem benefícios em participar?***

O único benefício para o participante é a oportunidade de contribuir para o estudo com sua percepção e experiência em um tema relacionado com sua atuação política.

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[10] Segundo Dexter (2006) essa abordagem tem sido adotada com mais frequência com participantes influentes, proeminentes e bem-informados, dentre os quais “...altos funcionários do governo, ministros ou membros do Parlamento” (Central University Research Ethics Committee, 2018) (tradução nossa)

7. O que acontece com os dados fornecidos?

As informações que você fornecer durante o estudo são os **dados da pesquisa**. Quaisquer dados de pesquisa dos quais você possa ser identificado (nome, gênero, raça, data de nascimento, formação acadêmica, partido político, e gravação do vídeo ou áudio) é conhecido como **dados pessoais.** Com exceção da gravação da entrevista, os demais dados são públicos e foram coletados no site da própria [Câmara de Deputado/Senado/Assembleia Legislativa do Estado de São Paulo/Câmara de Vereadores do Município de São Paulo], ou na página de divulgação de candidaturas e contas eleitorais do Tribunal Superior Eleitoral (http://divulgacandcontas.tse.jus.br/).

Os **arquivos de vídeo e áudio** serão armazenados localmente no disco rígido do computador do pesquisador, e será mantida uma cópia de segurança armazenada na área protegida (Cofre Pessoal) do serviço de nuvem OneDrive da Microsoft (https://www.microsoft.com/pt-br/microsoft-365/onedrive/personal-vault?smc365=personalvault&rtc=1) . Os arquivos serão também importados para o software Nvivo12 (https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home), de análise qualitativa de dados, onde serão transcritos. Os arquivos de projeto do Nvivo (.npv) serão trabalhados localmente no computador do pesquisador e mantida cópia de segurança no Cofre Pessoal do OneDrive. As cópias de segurança serão criptografadas com a ferramenta de compactação de arquivos 7-Zip (https://www.7-zip.org/7z.html).

Os arquivos originais das gravações serão oferecidos para os arquivos públicos/biblioteca da [Câmara de Deputados/Senado/Assembleia Legislativa do Estado de São Paulo/Câmara de Vereadores do Município de São Paulo] após a defesa da tese, prevista para ocorrer em abril de 2022. Além disso, serão mantidos pelo pesquisador, por até cinco anos da data da defesa de tese, para uso exclusivo nas publicações de artigos científicos resultantes da pesquisa. E, se autorizado, os arquivos serão transferidos e mantidos no repositório de dados científicos da USP (https://uspdigital.usp.br/repositorio/) para compartilhamento e reuso dos dados por outros pesquisadores, podendo ser em finalidades diversas da pesquisa, desde que de caráter acadêmico.

Outros dados de pesquisa, incluindo o termo de consentimento, serão armazenados por pelo menos cinco anos após a data da defesa de tese.

O pesquisador, o orientador e colaboradores contratados (tradutores e transcritores) poderão acessar os dados da pesquisa. Membros do Comitê de Ética em Pesquisa da FEA/USP poderão acessar os dados com a finalidade de monitoramento e/ou auditoria da pesquisa.

Se autorizado, poderá ser usada citação por meio de pseudônimo nos resultados da pesquisa.

8. O que acontecerá com os resultados da pesquisa?

Os resultados parciais da pesquisa poderão ser utilizados em artigos a serem submetidos para apresentação em eventos científicos nacionais e internacionais. A pesquisa será escrita como uma tese, em inglês. Após a aprovação na defesa da tese, ela será depositada tanto em formato impresso quanto online nos arquivos da Universidade, para facilitar seu uso em pesquisas futuras. A tese poderá permanecer com acesso inicialmente restrito, enquanto os artigos resultantes forem submetidos para publicação em revistas científicas. Encerrado o prazo, a tese será de acesso livre.

9. Quem está orientando e financiando a pesquisa?

O Prof. Dr. Cesar Alexandre de Souza (lattes.cnpq.br/9897564356792091) é o orientador da pesquisa, que não é financiada.

10. Quem revisou este estudo?

Este estudo foi revisado e aprovado, em 14/04/2020, pela Comissão Examinadora para o Exame Geral de Qualificação composta pelo Prof. Dr. Ernani Marques dos Santos (UFBA) e pela Profa. Dra. Manuela Maia Ribeiro (NIC.br).

11. ***Quem eu contato se tiver uma preocupação com o estudo ou quiser reclamar?***

Pode entrar em contato, na sequência, com o pesquisador (jose.galhardo@usp.br), com o orientador (calesou@usp.br) e com o Comitê de Ética em Pesquisa em Administração, Economia e Contabilidade (https://www.fea.usp.br/fea/colegiados-e-comissoes/comite-etica/membros-mandatos) Avenida Prof. Luciano Gualberto, 908, Cidade Universitária – Butantã – São Paulo, (011) 3091-5805.

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APPENDIX D Participant Consent Form Model Female

Termo de Consentimento Livre e Esclarecido

Declaro, por meio deste termo, que **concordei em ser entrevistada** para a pesquisa de campo intitulada **"*ICT Regulation Process: Habermas meets the Multiple Streams Framework*"** desenvolvida no Departamento de Administração da **FEA/USP**. Fui informada, ainda, de que a pesquisa é conduzida pelo candidato a doutorado **José Antonio Gouvêa Galhardo (FEA/USP)**, sob a orientação do **Prof. Dr. Cesar Alexandre de Souza (FEA/USP)**, a quem poderei consultar a qualquer momento que julgar necessário através dos e-mails calesou@usp.br e jaggalhardo@usp.br.

Afirmo que **aceitei participar por minha própria vontade**, sem receber qualquer incentivo financeiro ou ter qualquer ônus e com a finalidade exclusiva de colaborar para o sucesso da pesquisa. Fui ainda informada de que **posso me retirar** dessa pesquisa a qualquer momento, sem precisar justificar, sem sofrer quaisquer sanções ou constrangimentos. Fui também esclarecida de que os usos das informações por mim oferecidas estão submetidos às normas éticas da pesquisa científica na USP e ao disposto na Lei nº 13.709/2019 - Lei Geral de Proteção de Dados (LGPD).

Fui informada dos **objetivos acadêmicos do estudo** que busca conhecer e analisar o processo de regulação de tecnologias emergentes no Brasil. Confirmo que li e entendi a folha de informações da pesquisa, versão 3, de 06/11/2020. Tive a oportunidade de conhecer as **informações relacionadas à pesquisa**, fazer perguntas e obtive respostas satisfatórias quanto a: finalidade específica do tratamento; forma e duração; identificação e contato do controlador (doutorando); possibilidade de compartilhamento dos dados e a finalidade; e responsabilidades do agente que realizará o tratamento.

Fui informada de **meus direitos de requerer**, a qualquer momento, e obter do controlador: confirmação da existência de tratamento; acesso aos dados; correção de dados incompletos, inexatos ou desatualizados; anonimização, bloqueio ou eliminação de dados desnecessários, excessivos ou tratados em desconformidade com o disposto na LGPD; eliminação de dados pessoais tratados com meu consentimento; e revogação do consentimento.

( ) Autorizo / ( ) Não autorizo a realização da entrevista por meio da **plataforma de videoconferência _____.**

( ) Autorizo / ( ) Não autorizo que o **vídeo da entrevista seja gravado**.

( ) Autorizo / ( ) Não autorizo que **somente o áudio da entrevista seja gravado**.

Compreendo como as gravações de áudio e vídeo serão transcritas e usadas na pesquisa, com o auxílio da **ferramenta NVivo**. Fui esclarecida de que o **processo de anonimização pode ser reversível**.

( ) Autorizo / ( ) Não autorizo que o **meu nome seja citado** na lista de pessoas entrevistadas para esta pesquisa.

( ) Autorizo / ( ) Não autorizo o uso de **citações com pseudônimo** nos resultados da pesquisa.

Entendo que o acesso e análise dos dados se fará pelo pesquisador e orientador da pesquisa.

( ) Autorizo / ( ) Não autorizo a eventual **contratação de colaborador** pelo pesquisador para **tradução ou transcrição dos dados**.

Entendo como os dados serão armazenados, o que acontecerá com os dados no final do projeto, e como esta pesquisa será escrita e publicada.

( ) Autorizo / ( ) Não autorizo o armazenamento de **cópia de segurança** dos dados na área protegida (Cofre Pessoal) do serviço de armazenamento em **nuvem OneDrive da Microsoft**.

( ) Autorizo / ( ) Não autorizo a transferência e manutenção dos dados no **repositório de dados científicos da USP para compartilhamento e reuso dados por outros pesquisadores**, podendo ser em finalidades diversas da pesquisa, desde que de caráter acadêmico.

Eu entendo como comunicar uma preocupação ou fazer uma reclamação.

Atesto **recebimento de uma cópia assinada** deste Termo de Consentimento Livre Esclarecido, conforme recomendações da conduta de ética em pesquisa.

São Paulo, ___ de novembro de 2020.

Assinatura do(a) participante: _____

E-mail (se desejar receber os resultados da pesquisa): _____

Assinatura do pesquisador: _____

APPENDIX E Committee members, executive and public prosecutor experts, and legislative assistants interviewed

Mrs. Angela Regina Heinzen Amin Helou (Federal Deputy member of the Science and Technology, Communication and Informatics Committee from the Chamber of Deputies)

Mr. Aureo Lidio Moreira Ribeiro (Federal Deputy author of Bill 2303/2015 and member of the Special Committee from the Chamber of Deputies, destined to issue an opinion on the same, which provides for the inclusion of virtual currencies and air mileage programs in the definition of payment arrangements under the supervision of the Central Bank)

Mr. Marlon Farias da Luz (City Councilor elected in 2020 and member of the Transit, Transport and Economic Activity Committee from the São Paulo City Council)

Sr. Rodrigo Antonio de Agostinho Mendonça (Federal Deputy membro da Comissão de Ciência e Tecnologia, Comunicação e Informática da Câmara de Deputados)

Mr. Sérgio Luiz Victor Júnior (State Deputy President of the Science, Technology, Innovation and Information Committee from the São Paulo State Assembly)

Mrs. Miriam Wimmer (was Director of the Department of Telecommunications Services of the Ministry of Science, Technology, Innovations and Communications and is currently Director of the National Data Protection Authority)

Mr. Marco Tulio da Silva Lima (Blockchain Product Manager at Federal Data Processing Service — SERPRO)

Mr. Paulo César Rezende De Carvalho Alvim (was Secretary of Entrepreneurship and Innovation at the Ministry of Science, Technology, Innovations and Communications and is currently Minister of Science, Technology and Innovations)

Mr. Rodrigo Barbosa de Castilho (Prosecutor of the Public Labour Prosecution Office (MPT) in São Paulo, MPT Digital Platforms Project Manager)

Mrs. Cristiane Musa Pino Miranda (Special Coordinator of the Cabinet of City Councilor Marlon Luz)

Mr. Wesley Sidou Pimentel (Legislative Technician Subchief of Cabinet of Senator Styvenson Valentim)

APPENDIX F Example of coding methods used based on Saldaña's (2009) guidelines

Cycle	Method	Coding	Description and application	Approach	Example
First	Grammatical	Attribute	Notation of basic descriptive information, usually at the beginning of a data set. Organizations and Actors' characteristics or demographics.	Deductive	FS: House Federal Senate
	Exploratory	Provisional	Few initial codes based on what the initial investigation and theoretical framework suggest. Basic MSFs and TCA's concepts, the type of technology under discussion, some expected problems raised, and other actors in the discussion.	Deductive	(TCA) Ideal Speech Situation: "As there will be a presentation, all invited people have the right to speak. Not only the companies that will make the presentation. All the people whom today need to place their position."
		Holistic	A single code is applied to a large unit of data in the corpus to capture the sense of the overall content. It is useful when the researcher already has a general idea of what to investigate in the data. Same basic MSF and TCA concepts, as well as signals of the colonization process of Habermas' Lifeworld and unexpected issues.	Deductive/ Inductive	(MSF) Ambiguity: "Natália, get organized. Create a single discussion. Bring a single agenda. Otherwise, the deputies' minds do not understand what this is today."
	Elemental	In Vivo	A word or short phrase from the actual language found in the qualitative data record that may represent members' particular culture, subculture, or microculture. Unexpected issues.	Inductive	Technological white elephant: "Technological white elephants: investments in technology that quickly turn out to be obsolete or do not meet what they intended or whose maintenance is expensive and are scrapped.
		Descriptive	Summarizes in a word or short phrase the basic topic of a passage of qualitative data. General use.	Inductive	Social media: "We are working with our team. The demand is so great through

Cycle	Method	Coding	Description and application	Approach	Example
					WhatsApp, Instagram, and Facebook that we cannot handle it."
	Affective	Values	Reflect a participant's values, attitudes, and beliefs, representing his or her perspectives or worldview. A value is an importance we attribute to oneself, another person, thing, or idea. An attitude is how one thinks and feels about oneself, another person, thing, or idea. A belief is part of a system that includes our values and attitudes, knowledge, experiences, opinions, prejudices, morals, and other interpretive perceptions of the social world. Values Coding does not necessarily have to code for all three or differentiate between them unless the study's goals include determining participant motivation, agency, causality, or ideology. Values Codes can be determined a priori (beforehand) as Provisional Codes or constructed during the data coding. Interviewees' perspectives or worldviews, some of them as Provisional Codes, based on TCA concepts.	Inductive	Progressive maturing: "What we perceive very clearly is that these texts need to mature. For society to be able to evolve, it usually is progressive, and this progressive journey involves the maturing of the matter."
		Versus	Phrases that capture the actual and conceptual conflicts within, among, and between participants. Identify in binary terms the individuals, groups, social systems, organizations, phenomena, processes, concepts, etc., in direct conflict with each other.	Inductive	Regulated x Unregulated: "Perhaps you have followed Anatel's decisions involving Claro and FOX. When you start putting linear programming channels on the internet without having authorization, this is perceived as a breach of the regulatory balance. It is a dispute, shall we say, illegitimate because some are subject to the entire regulatory framework, others are not."

Cycle	Method	Coding	Description and application	Approach	Example
Second		Pattern	The “meta-code” category label that identifies similarly coded data.	Inductive	Conduct: joining codes like "Progressive maturing", "Like Challenge", "Humility/unpretentiousness", and others.

Source: by the author

APPENDIX G Examples of ICT Technologies Subject to Brazilian Constitutional Legislative Competencies Distribution

Competence	Level	Federal Constitution	Subject	Examples of Technology
Concurrent	All	Art. 24 IX	education, culture, teaching, and sports	e-Learning, Virtual/Augmented reality, Surveillance, AI
Concurrent	All	Art. 24 XI	judicial procedures	Blockchain, AI
Concurrent	All	Art. 24 V	production and consumption	Platforms, 3D printing, Robots, Social media, AI
Concurrent	All	Art. 24 XII	protection and social integration of disabled persons	IoT, Surveillance
Concurrent	All	Art. 24 XII	protection of childhood and youth	IoT, Surveillance, Social media
Concurrent	All	Art. 24 XII	social security, protection, and healthcare	IoT, Smart City, Surveillance
Concurrent	All	Art. 24 I	tax, financial, penitentiary, economic and urbanistic law	Smart City, Platforms, Blockchain, Crowdsourcing
Concurrent	All	Art. 24 III	trade boards	Smart contracts
Exclusive	Federal	Art. 22 I	civil, commercial, criminal, procedural, electoral, agrarian, maritime, aeronautical, space, and labor law	Blockchain, Drones, Surveillance, Platforms Crowdsourcing
Exclusive	Federal	Art. 21 XX	establish directives for urban development, including housing, basic sanitation, and urban transportation	Autonomous vehicles, Drones, Platforms
Exclusive	Federal	Art. 21 XXI	establish principles and directives for the national transportation system	Autonomous vehicles, Drones, Platforms
Exclusive	Federal	Art. 21 VII	issue currency	Cryptocurrencies
Exclusive	Federal	Art. 21 XI	operate, directly or through authorization, concession or permission, the telecommunications services, as set forth by law, which law shall provide for the organization of the services, the establishment of a regulatory agency, and other institutional issues	Platforms
Exclusive	Federal	Art. 21 XII a	operate, directly or through authorization, concession, or permission: a) the services of sound broadcasting and sound and image broadcasting	Platforms
Exclusive	Federal	Art. 21 XII c	operate, directly or through authorization, concession, or permission: c) air and aerospace navigation and airport infrastructure	Drones

Competence	Level	Federal Constitution	Subject	Examples of Technology
Exclusive	Federal	Art. 21 XII d	operate, directly or through authorization, concession, or permission: d) railway and waterway services between seaports and national borders or which cross the boundary of a state or territory	Autonomous vehicles
Exclusive	Federal	Art. 21 XII e	operate, directly or through authorization, concession, or permission: e) interstate and international highway passenger transportation services	Autonomous vehicles, Platforms, Crowdsourcing
Exclusive	Municipal	Art. 30 I	legislate upon matters of local interest	Platforms, Autonomous vehicles, Drones, IoT, Smart City
Exclusive	Municipal	Art. 30 VI	maintain, with the technical and financial cooperation of the Federal Government and the state, programs for infant and elementary school education	e-Learning, Virtual reality, Augmented reality, Surveillance
Exclusive	Municipal	Art. 30 V	organize and render, directly or by concession or permission, the public services of local interest, including mass transportation, which is of essential nature	Platforms, Autonomous vehicles, Smart City, Surveillance
Exclusive	Municipal	Art. 30 VIII	promote, wherever pertinent, adequate territorial ordaining through planning and control of use, apportionment, and occupation of the urban soil	Platforms
Exclusive	Municipal	Art. 30 VII	provide, with the technical and financial cooperation of the Union and the state, health services to the population	IoT, Smart City, Surveillance
Exclusive Delegable to States	Federal	Art. 22 XXIX	commercial advertising	Platforms, Social media
Exclusive Delegable to States	Federal	Art. 22 XXIV	directives and bases of the national education;	e-Learning, Virtual/Augmented reality
Exclusive Delegable to States	Federal	Art. 22 VIII	foreign and interstate trade	Platforms
Exclusive Delegable to States	Federal	Art. 22 XXI	general organization rules, troops, material, guarantees, drafting, and mobilization of the military police and military fire brigades;	Surveillance, AI
Exclusive Delegable to States	Federal	Art. 22 XXVII	general rules for all types of bidding and contracting for governmental entities, associate government agencies, and foundations of the Union, the States, the Federal District, and the Municipalities, following article 37, XXI, and for public enterprises and joint stock companies, under the terms of article 173, paragraph 1, III;	Blockchain
Exclusive Delegable to States	Federal	Art. 22 IX	guidelines for the national transportation policy	Platforms, Autonomous vehicles

Competence	Level	Federal Constitution	Subject	Examples of Technology
Exclusive Delegable to States	Federal	Art. 22 VII	policies for credit, foreign exchange, insurance, and transfer of values	Cryptocurrencies
Exclusive Delegable to States	Federal	Art. 22 XXV	public registers	Blockchain, Smart contracts
Exclusive Delegable to States	Federal	Art. 22 XXVIII	territorial defense, aerospace defense, maritime defense, civil defense, and national mobilization	Cryptocurrencies
Exclusive Delegable to States	Federal	Art. 22 VI	the monetary and measures systems, metal certificates, and guarantees	Cryptocurrencies
Exclusive Delegable to States	Federal	Art. 22 XVI	the organization of the national employment system and conditions for the practice of professions	Platforms
Exclusive Delegable to States	Federal	Art. 22 X	the regime of the ports and lake, river, ocean, air, and aerospace navigation	Autonomous vehicles, Drones
Exclusive Delegable to States	Federal	Art. 22 XI	traffic and transportation	Platforms, Autonomous vehicles, Drones
Exclusive Delegable to States	Federal	Art. 22 IV	waters, energy, informatics, telecommunications, and radio broadcasting	Platforms, 5G

Source: by the author.

APPENDIX H Research Instrument

Academy's Perception of the Emerging ICT Regulation Problem

* Mandatory

Participants Informed Consent

Thank you for accepting to participate in this research conducted by [researcher name], a Ph.D. candidate in Business Administration at the Faculty of Economics, Business and Accounting at the University of São Paulo (FEA/USP) and supervised by Professor [advisor name] from FEA/USP.

You were invited to participate because of your performance in the academy as a **teacher and/or researcher**.

This study aims to understand the **perception of different areas of the academy about the problem of regulating emerging information and communication technologies (ICT)**.

The regulation concept used throughout the questionnaire covers the creation of laws by the legislative houses of the federative entities and the edition of infra-legal norms by the executive branch and regulatory agencies.

You can express the degree of importance you give to statements made and doubts raised by parliamentarians, specialists from the executive branch, and the prosecutor's service who participated in public hearings promoted by the legislative houses of the federal, the state of São Paulo, and the municipality of São Paulo, in 2019, which we interviewed in the previous stage of this research.

We estimate it will take you around **15 minutes** to complete the questionnaire.

Participation is entirely **voluntary**. If you decide to participate, you may withdraw at any time, for any reason, before submitting your responses by pressing the 'Exit'/closing the browser.

The only **personal data** we will collect (which **response is mandatory**) is your age group; the country where you were born; the areas of knowledge of your academic background; and if you work as a civil servant or in a commissioned position in public administration. If you do not want to answer any other question, you can ignore it.

Your answers will be **confidential** and only used when combined with other responses.

We will use the research results in publishing scientific articles, presenting at conferences, webinars, and postings on websites, blogs, traditional media, and social networks.

We hope you feel free to share your own insights into the issue.

1. If you have read the above information and agree to participate with the understanding that the research will process the data (including any personal data) you submit accordingly; please tick the box below to get started. *

o Yes, I agree to participate

o I do not agree to participate

Section Demographic profile

The objective of this section was to survey the generational profile, the legal system culture, the respondent's academic background, and possible position as a public servant.

2. What is your age group? *

- ○ 21 to 29 years
- ○ 30 to 39 years
- ○ 40 to 49 years
- ○ 50 to 59 years
- ○ ○ 60 years or more

3. What is your born country? *

- ○ Brazil
- ○ Other_____

4. Identify the area(s) of knowledge of your academic background. * Include undergraduate, master, and doctoral areas.

- ○ Administration/ Management
- ○ Anthropology
- ○ Biology
- ○ Political science
- ○ Accounting
- ○ Law
- ○ Economy
- ○ Engineering
- ○ Philosophy
- ○ Informatics and Computer Science
- ○ Mathematics and Statistics
- ○ Medicine
- ○ Psychology
- ○ Sociology
- ○ Other _____

5. Do you work as a public servant or in a commissioned position?

- ○ No
- ○ Yes, at a Higher Education Institution or Research Center
- ○ Yes, in another body or entity of the Executive, Legislative, Public Prosecutions Service, or Judiciary

Section Experience in the emerging ICT regulation

The objective of this section is to survey researchers' experiences in the ICT regulation process in recent years.

6. How have you participated in ICT regulation discussions in the last five years?

- ○ I read the reference document/proposal in Public Consultation.
- ○ I contributed with criticism/suggestion in Public Consultation.
- ○ I participated as a guest speaker at a Public Hearing.

- o I watched a Public Hearing and forwarded questions through the channel/platform for citizen participation.
- o I was hired or invited by a government agency to issue an opinion and make recommendations.
- o I was hired or invited by a company, a class body, or a civil organization to express opinions and make recommendations.
- o I was hired or invited by a multilateral organization to issue an opinion and make recommendations.
- o I was informally contacted by a parliamentarian, an executive branch authority, a prosecutor, or a judge to issue an opinion and make recommendations.
- o I did not participate because I did not follow or was not interested in participating.
- o Other _____

7. If you contributed with criticisms or suggestions in the Public Consultations, please indicate which ones.

- o Brazilian Artificial Intelligence Strategy
- o Brazilian strategy for fifth-generation networks (5G)
- o Brazilian Strategy for Digital Transformation
- o National Innovation Strategy
- o Digital Government Strategy
- o National Plan for the Internet of Things
- o Reference Model for Publication of Open Data
- o Legal framework for Startups
- o Strategic Plan for Information and Communication Technology 2021-2024 of the city of São Paulo
- o Other _____

8. Were your criticisms or suggestions utilized?

- o Yes, a good part.
- o No, very few.
- o I do not know. I did not check

Section Perception of the difficulties of regulating emerging ICTs

In the literature review, we identified the existence of at least six groups of difficulties. Difficulties in meeting social objectives are related to philosophical and sociological issues. Environmental difficulties are related to the political and multidisciplinary environment in which regulatory discussions and decisions occur and geopolitical aspects. Technical difficulties are related, for example, to computational limitations or the complexity of modeling the decision-making process. Legal difficulties involve aspects of the field of law, for example, the conflict between legislations. Individual behavioral difficulties or regulators' characteristic traits, for example, lack of knowledge. Finally, externalities that influence

regulation. This section aims to raise the researcher's perception of some difficulties regulating ICT classified in these groups.

9. In your opinion, how do the elements below impact emerging ICT regulation in terms of difficulty to be overcome?

[1] No difficulty [2] Few [3] Reasonable [4] Lots of [5] Extreme difficulty [0] I do not know, or I prefer not to comment

Difficulties	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[0]**
Access to corporate data and algorithms						
Competition and conflict between different forms of regulation						
The apocalyptic vision of artificial intelligence in cinema						
Business lobbying						
The complexity of human interaction						
Relying entirely on information/opinions from professional or business organizations						
Incorporate ethics in the design, development, and use of technological artifacts						
The enforcement of existing legislation						
Occurrence of failures/fatalities or unlawful use with high media coverage						
Multidisciplinary						
Sharing true values among the various stakeholders						
A national culture that influences the flexibility, bureaucracy, and efficiency of regulators						

Section Values, Needs, and Concerns

We identified values, beliefs, and concerns in excerpts from interviews carried out with parliamentarians, members of the specialized Science and Technology Committees, parliamentary assistants, and bureaucrats from the executive branch and public prosecution service who participated as guests in Public Hearings. The objective of this section is to assess the respondent's importance to some statements or doubts classified as values, needs, and concerns.

10. For each selected interview excerpt, mark its degree of importance for the value associated with the statement or question presented.

[1] Irrelevant [2] Little importance [3] Important [4] Very important [5] Essential [0] I do not know, or I prefer not to comment

Values	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[0]**
Challenge: "It is very, very much **challenging** and exciting, but it is also a privilege for us to live this moment. Fifteen years from now, when everything is better organized, people						

Values	[1]	[2]	[3]	[4]	[5]	[0]
will look back... "wow, the people who were there at the beginning of the conformation of this new communications scenario...."						
Unpretentious/Humility: "...I think that my role is to take the information as clear as possible, more objective possible, but I also understand that **difficultly I will succeed in changing the opinion of somebody**."						
Neutrality: “I want to make this line very clear so that people... so that professionals have a better quality of life, can work more independently, and apps can also earn more. **I think my job is always a win-win**.”						
Liberal: "We can and should discuss the limits of regulation, **but not to the point of making the business unfeasible**."						
Regulation is possible: "...**the internet is a regulated environment, yes**. Moreover, in this environment, the asymmetries, the disparities in strength that we already saw in the real environment will reproduce."						
Regulation is impossible: "...**the internet is an unregulated space**, or not subject to regulation, or that should not be regulated."						
Incremental progression: "Society in order to walk, it... normally... is progressive... and this **progressive walk passes through the maturation of matters**."						
Government obstacle/inefficient: "The point is that it will delay the process and make progress difficult, but this still shows a very narrow view that **the implementation of technology is the implementation for the sake of implementation**."						
Waste of time/disbelief: “Maybe this discussion on a more open model, a public network, or other crypto assets gets lost in the time it takes for a bill to be discussed and appreciated in the House and Senate and be approved. **You may end up missing these questions.**”						
Culture: "the big challenge is not even legislative anymore. I think it is **cultural**."						

11. For each selected interview excerpt, mark its degree of importance for the need associated with the statement or question presented.

[1] Irrelevant [2] Little importance [3] Important [4] Very important [5] Essential [0] I do not know, or I prefer not to comment

Needs	[1]	[2]	[3]	[4]	[5]	[0]
Transparency: “So, **it is crucial that society can follow**. Today there are tools. Any Brazilian can access TV Câmara, Rádio						

Needs	[1]	[2]	[3]	[4]	[5]	[0]
Câmara, and the Chamber, Senate, and Congress websites and follow the debates.”						
Human dignity: "We really need a law to **implement a human department to see if there is injustic**e with the labor relationship, with people..."						
Diversity: “The issue of diversity is not about gender only, but it is diversity in the broadest sense. People are different. Territories are different. So, the fullness of diversity needs to be respected. Because regulation is a standard, and sometimes the pattern is dumb. So, **you have to perceive how this affects the different actors in the ecosystem**.”						
Adherence to society: "as these companies that appeared in the market, they greatly reduced the price of the product, and they made the market more agile, that is, the service that is provided is a service provided much faster, much more agile, much more efficient and with a much lower price, **society tends to consider that these companies are doing a good business, they are meeting society's desires**, these companies are right. They offer work and very high-quality service to society."						
Social protection: "I believe; I even read some guys on the subject... I believe that **a universal basic income should already be considered**. I understand the problems of this income because what is basic in one place is not basic in another, but people will need to be prepared to either change jobs or adapt to a new phase. Anyway, it takes at least three years of preparation to change… two years. So, what do you do?... It is complicated."						
Government protagonism: “I often noticed that whoever was in the area, inside the government, had a perhaps more accurate perception of the existing problems than an external consultancy. Of course, it also adds value, but **I do not see the possibility of replacing the analysis of those in public administration with a consulting study**.”						
Nationalism: “You have to commit to the citizen, a commitment to society, a commitment to territory, **a commitment to the nation**.”						
Long-term planning: “Because what I miss as a politician, as a deputy, as someone who feels the need to be accountable, **what is our plan for two thousand and forty, two thousand and fifty**? Where do we want to go?”						
Participation: "I think that the digital divide accentuates the situation that already exists about the fact that not everyone affected by a phenomenon will naturally participate in the construction of solutions. Some will naturally be spectators,						

Needs	[1]	[2]	[3]	[4]	[5]	[0]
and others will be actors, which was already true in the pre-digital world. So, **some people want to get involved in processes of political discussion, debates, participation**, and others will complain, they will think it is good, they will think it is bad, but they will not want to get involved."						

12. For each selected interview excerpt, mark its degree of importance with the concern associated with the statement or question presented.

[1] Irrelevant [2] Little importance [3] Important [4] Very important [5] Essential [0] I do not know, or I prefer not to comment

Concern	[1]	[2]	[3]	[4]	[5]	[0]
Justice divide: “The normal driver **doesn't have easy access to the legal system** and, in a way, the apps they samba on. They do wrong things, nobody... the driver doesn't know how to complain.”						
Digital divide: “My grandmother lives in the countryside. Besides the generational matter, there is no telephone there. I think about the children who are growing up there. **They are outside the digital world, where connectivity is a prerequisite**.”						
Results/Impacts: "The legislation must have much rationality, and a **commitment to impacts, to results**. It cannot be emotion. Furthermore, much legislation we see being processed and approved is pure emotion. Hence this will usually cause future problems."						
Safety: “**My concern is protection**. It is so much so that my question to natália is about safety. My question to you is about security. All the questions I am going to ask are about protection.”						
Business environment: “Then, there is our tax system too, which is an insane asylum. Nowadays, **with the ease of setting up headquarters abroad, you see several startups setting up headquarters abroad, providing services here**. We are scaring away the best we can have.”						
Universality of benefits: “**To serve the citizen within a state whose contact difficulty is much broader than in the region where we live**. So, this discussion comes up a lot at this moment of the pandemic and the debate on 5G.”						
Delay of legislation: “Today, due to digital transformation, we see a phenomenon in which everything becomes the object of technology. All sectors of the economy, society, and the public sector are now impacted by these technological phenomena that generate a **brutal change in the speed at**						

Concern	[1]	[2]	[3]	[4]	[5]	[0]
which things happen and quickly create this lag in legislation approved by the National Congress.”						
Asymmetry:” It is a dispute, shall we say, illegitimate because **some are subject to the entire regulatory framework, others are not**.”						
Punitive bias: "Today, the rules are so strict on top of the error that, as I said, the person has no incentive to think outside their line there ((gesture with the hands in parallel limiting the vision)) with **fear of making mistakes. Moreover, they are afraid of being punished... improbity... Today, I think the fear of making mistakes has become more expensive than corruption**."						
Outdated legal institutes: You have our constitution, our fundamental document, and a series of **mechanisms to protect certain legal assets which no longer make sense.** How will I restrict foreign capital on the internet if I can access the content from anywhere? Does that make sense? Does it make sense to talk about content quota? Does it make sense to speak about granting so you can provide a service?						

APPENDIX I Research model for discriminant analysis of grand academic fields

Response ID						
Variable	**Type**	**Question/Data**	**Values**	**Missing**	**Action**	**Correction *Id***
Id	Ordinal	Respondent ID	None	NA	NA	NA
Hi	Time	start time	None	NA	NA	NA
Hc	Time	completion time	None	NA	NA	NA
tempo	Interval	Filling Time	*hc - hi*	NA	Analyze extreme observations. Average.	NA
Nconcorda	Nominal	1. If you have read the above information and agree to participate with the understanding that the research will process the data (including any personal data) you submit accordingly; please tick the box below to get started.	0 = No; 1 = Yes	0 = No	Delete from database	24 and 45 excluded

Demographics						
Variable	**Type**	**Question**	**Values**	**Missing**	**Action**	**Correction *Id***
Idade	Ordinal	2. What is your age group?	2 = 21 to 29 years; 3 = 30 to 39 years; 4 = 40 to 49 years; 5 = 50 to 59 years; 6 = 60 years or more	NA	NA	NA
paisnasc	Nominal	3. What is your born country?	Brasil; Outros	NA	NA	NA
paislaw	Nominal		0 = civil; 1 = common-law; 2 = muslim	NA	Convert *paisnasc* to country legal system scale	
formacao	Nominal	4. Identify the area(s) of knowledge of your academic background. * Include undergraduate, master, and doctoral areas.	Administration/Management, Accounting, Economy, Informatics and Computer Science, Engineering, Mathematics and Statistics, Law, Sociology, Anthropology, Philosophy, Political science, Biology, Medicine, Psychology, and Other	Other as the only background area.	Delete from database	15, 17, 20, 21, 48, 81, 97, 134, 147, 154 excluded

Demographics						
Variable	**Type**	**Question**	**Values**	**Missing**	**Action**	**Correction *Id***
formacao1	Nominal	4. Identify the area(s) of knowledge of your academic background. * Include undergraduate, master, and doctoral areas.	A = Administration/Management, Accounting, Economy; C = Informatics and Computer Science, Engineering, Mathematics and Statistics; D = Law; S = Sociology, Anthropology, Philosophy, Political science; O = Others, Biology, Medicine, Psychology.	NA	Convert *formacao* to scale by aggregating the areas into five grand groups. The *formacao* with different grand groups codes expresses multidisciplinary.	
area	Nominal		A = Administration/Management, Accounting, Economy; C = Informatics and Computer Science, Engineering, Mathematics and Statistics; D = Law; S = Sociology, Anthropology, Philosophy, Political science; O = Others, Biology, Medicine, Psychology; M = Multidisciplinary (more than one area)	NA	Convert *formacao1* by adding the multidisciplinary area in a sixth group.	
profissao	Nominal	5. Do you work as a public servant or in a commissioned position?	No; Yes, at a Higher Education Institution or Research Center; Yes, in another body or entity of the Executive, Legislative, Public Prosecutions Service, or Judiciary	NA	NA	NA
servidor	Nominal		0 = No; 0 = Yes, at a Higher Education Institution or Research Center; 1 = Yes, in another body or entity of the Executive, Legislative, Public Prosecutions Service, or Judiciary	NA	Convert *profissao* to a dichotomous scale to identify servants or commissioned respondents in positions other than that of professor or researcher.	

Dimension Participation						
Variable	**Type**	**Question**	**Values**	**Missing**	**Action**	**Correction *Id***
particip	Nominal	6. How have you participated in ICT regulation discussions in the last five years?	I read the reference document/proposal in Public Consultation; I contributed with criticism/suggestion in Public Consultation;	Did not participate	Create dummy variables taking as a reference that did not participate. The	ID corrected: 23(0); 41(0); 42(0); 46(0); 47(0); 49(0); 52(0); 61(0);

Dimension Participation						
Variable	**Type**	**Question**	**Values**	**Missing**	**Action**	**Correction *Id***
			I participated as a guest speaker at a Public Hearing; I watched a Public Hearing and forwarded questions through the channel/platform for citizen participation; I was hired or invited by a government agency to issue an opinion and make recommendations; I was hired or invited by a company, a class body, or a civil organization to express opinions and make recommendations; I was hired or invited by a multilateral organization to issue an opinion and make recommendations; I was informally contacted by a parliamentarian, an executive branch authority, a prosecutor, or a judge to issue an opinion and make recommendations; I did not participate because I did not follow or was not interested in participating; Other		*Other* option was analyzed and did not add new participation options. Check and correct the data filled in as Other.	63(0); 74(0); 76(0); 98(0); 109(0); 116(0); 125(0); 126(0)
particip_lidoc	Nominal	I read the reference document/proposal in Public Consultation.	0 = No; 1 = Yes	NA	dummy	NA
particip_critic	Nominal	I contributed with criticism/suggestion in Public Consultation.	0 = No; 1 = Yes	NA	dummy	NA
particip_palest	Nominal	I participated as a guest speaker at a Public Hearing.	0 = No; 1 = Yes	NA	dummy	NA
particip_assist	Nominal	I watched a Public Hearing and forwarded questions through the channel/platform for citizen participation.	0 = No; 1 = Yes	NA	dummy	NA

Dimension Participation						
Variable	**Type**	**Question**	**Values**	**Missing**	**Action**	**Correction *Id***
particip_publico	Nominal	I was hired or invited by a government agency to issue an opinion and make recommendations.	0 = No; 1 = Yes	NA	dummy	NA
particip_privado	Nominal	I was hired or invited by a company, a class body, or a civil organization to express opinions and make recommendations.	0 = No; 1 = Yes	NA	dummy	NA
particip_organismo	Nominal	I was hired or invited by a multilateral organization to issue an opinion and make recommendations.	0 = No; 1 = Yes	NA	dummy	NA
particip_informal	Nominal	I was informally contacted by a parliamentarian, an executive branch authority, a prosecutor, or a judge to issue an opinion and make recommendations.	0 = No; 1 = Yes	NA	dummy	NA
particip_nao	Nominal	I did not participate because I did not follow or was not interested in participating.	0 = No; 1 = Yes	NA	dummy	NA
particip1	Nominal	dummy if any of the participation options were indicated	0 = No; 1 = Yes	NA	NA	NA
particip2	Interval	Summing the participation options selected	if *particip_nao* = 0 then Σ (*paticip_...*)	NA	Alternative that allows weighting participation in different ways by the same respondent.	

Dimension Contribution						
Variable	**Type**	**Question**	**Values**	**Missing**	**Action**	**Correction *Id***
contribuiu	Nominal	7. If you contributed with criticisms or suggestions in the Public Consultations, please indicate which ones.	Brazilian Artificial Intelligence Strategy; Brazilian strategy for fifth-generation networks (5G);	Did not contribute	Check and correct the data filled in as Other. Consist with the information filled	2(0); 16(0); 23(0); 29(0); 42(0); 55(0); 58(0); 60(0); 61(0); 76(0); 92(0); 98(0); 102(0); 104(0); 109(0); 126(0); 140(0); 149(0). 85(0) e 169(0) for

Dimension Contribution						
Variable	**Type**	**Question**	**Values**	**Missing**	**Action**	**Correction *Id***
			Brazilian Strategy for Digital Transformation; National Innovation Strategy; Digital Government Strategy; National Plan for the Internet of Things; Reference Model for Publication of Open Data; Legal framework for Startups; Strategic Plan for Information and Communication Technology 2021-2024 of the city of São Paulo. Other		in the *particip*. Create dummy variables taking as a reference that did not contribute.	inconsistency with the answer to *particip_nao.*
contribuiu_IA	Nominal	Brazilian Artificial Intelligence Strategy	0 = No; 1 = Yes	NA	dummy	NA
contribuiu_5G	Nominal	Brazilian strategy for fifth-generation networks (5G)	0 = No; 1 = Yes	NA	dummy	NA
contribuiu_DigiTrans	Nominal	Brazilian Strategy for Digital Transformation	0 = No; 1 = Yes	NA	dummy	NA
contribuiu_Inova	Nominal	National Innovation Strategy	0 = No; 1 = Yes	NA	dummy	NA
contribuiu_DigGov	Nominal	Digital Government Strategy	0 = No; 1 = Yes	NA	dummy	NA
contribuiu_IoT	Nominal	National Plan for the Internet of Things	0 = No; 1 = Yes	NA	dummy	NA
contribuiu_OpenData	Nominal	Reference Model for Publication of Open Data	0 = No; 1 = Yes	NA	dummy	169(0) Corrected based on *particip*
contribuiu_Starups	Nominal	Legal framework for Startups	0 = No; 1 = Yes	NA	dummy	169(0) Corrected based on *particip*
contribuiu_PETISP	Nominal	Strategic Plan for Information and Communication Technology 2021-2024 of the city of São Paulo	0 = No; 1 = Yes	NA	dummy	NA

Dimension Contribution						
Variable	**Type**	**Question**	**Values**	**Missing**	**Action**	**Correction *Id***
contribuiu1	Nominal	dummy if any of the contribution options were indicated	0 = No; 1 = Yes	NA	NA	NA
contribuiu2	Interval	Summing the contribution options marked	Σ (*contribuiu_...*)	NA	An alternative allows the weighting of respondents' contributions by the different forms.	
aproveitada	Nominal	8. Were your criticisms or suggestions utilized?	0 = Did not participate; 1 = Yes, a good part; 2 = No, very few; 3 = I do not know. I did not check	Did not participate	Convert to a numeric scale. Check the consistency of filling in *particip* and *contribuiu*.	2(0); 7(0); 16(0); 23(0); 29(0); 38(0); 39(0); 42(0); 55(0); 58(0); 59(0); 60(0); 61(0); 76(0); 78(0); 82(0); 84(0); 92(0); 93(0); 94(0); 98(0); 102(0); 104(0); 109(0); 112(0); 118(0); 125(0); 126(0); 140(0); 144(0); 149(0); 157(0). 85(0) and 169(0) for inconsistency with the *partip_nao* answer. 166(0) and 172(0) for inconsistency with the *contribuiu* answer.

Dimension Difficulties						
Variable	**Type**	**Question**	**Values**	**Missing**	**Action**	**Correction *Id***
-	-	In your opinion, how do the elements below impact emerging ICT regulation in terms of difficulty to be overcome?	1 = No difficulty; ~ 2 = Few; 3 = Reasonable; 4 = Lots of; 5 = Extreme difficulty; 0 = I do not know, or I prefer not to comment	0 or empty	Convert to the numeric scale.	NA
dif_acesso	Ordinal	Access to corporate data and algorithms				
dif_formareg	Ordinal	Competition and conflict between different forms of regulation				
dif_iaapocal	Ordinal	The apocalyptic vision of artificial intelligence in cinema				
dif_lobby	Ordinal	Business lobbying				
dif_relhuman	Ordinal	The complexity of human interaction				
dif_confia	Ordinal	Relying entirely on information/opinions from professional or business organizations				

Dimension Difficulties						
Variable	**Type**	**Question**	**Values**	**Missing**	**Action**	**Correction *Id***
dif_etica	Ordinal	Incorporate ethics in the design, development, and use of technological artifacts	1 = No difficulty; ~ 2 = Few; 3 = Reasonable; 4 = Lots of; 5 = Extreme difficulty; 0 = I do not know, or I prefer not to comment	0 or empty	Convert to the numeric scale.	NA
dif_tradleg	Ordinal	The enforcement of existing legislation				
dif_falha	Ordinal	Occurrence of failures/fatalities or unlawful use with high media coverage				
dif_multidisc	Ordinal	Multidisciplinary				
dif_valorverd	Ordinal	Sharing true values among the various stakeholders				
dif_cultura	Ordinal	A national culture that influences the flexibility, bureaucracy, and efficiency of regulators				

Dimension Worldview (Values)						
Variable	**Type**	**Question**	**Values**	**Missing**	**Action**	**Correction *Id***
-	-	10. For each selected interview excerpt, mark its degree of importance for the value associated with the statement or question presented.	1 = Irrelevant; 2 = Little importance; 3 = Important; 4 = Very important; 5 = Essential; 0 = I do not know, or I prefer not to comment	0 or empty	Convert to the numeric scale.	NA
val_desafio	Ordinal	Challenge: “It is very, very much challenging and exciting, but it is also a privilege for us to live this moment. Fifteen years from now, when everything is better organized, people will look back... "wow, the people who were there at the beginning of the conformation of this new communications scenario...."				
val_humildade	Ordinal	Unpretentious/Humility: "...I think that my role is to take the information as clear as possible, more objective possible, but I also understand that difficultly I will succeed in changing the opinion of somebody."				
val_neutralidade	Ordinal	Neutrality: “I want to make this line very clear so that people... so that professionals have a better quality of life, can work more independently, and apps can also earn more. I think my job is always a win-win.”				
val_liberal	Ordinal	Liberal: "We can and should discuss the limits of regulation, but not to the point of making the business unfeasible."				

Dimension Worldview (Values)						
Variable	**Type**	**Question**	**Values**	**Missing**	**Action**	**Correction *Id***
val_regsim	Ordinal	Regulation is possible: "...the internet is a regulated environment, yes. Moreover, in this environment, the asymmetries, the disparities in strength that we already saw in the real environment will reproduce."	1 = Irrelevant; 2 = Little importance; 3 = Important; 4 = Very important; 5 = Essential; 0 = I do not know, or I prefer not to comment	0 or empty	Convert to the numeric scale.	NA
val_regnao	Ordinal	Regulation is impossible: "...the internet is an unregulated space, or not subject to regulation, or that should not be regulated."				
val_increment	Ordinal	Incremental progression: "Society in order to walk, it... normally... is progressive... and this progressive walk passes through the maturation of matters."				
val_govinef	Ordinal	Government obstacle/inefficient: "The point is that it will delay the process and make progress difficult, but this still shows a very narrow view that the implementation of technology is the implementation for the sake of implementation."				
val_tempo	Ordinal	Waste of time/disbelief: “Maybe this discussion on a more open model, a public network, or other crypto assets gets lost in the time it takes for a bill to be discussed and appreciated in the House and Senate and be approved. You may end up missing these questions.”				
val_cultura	Ordinal	Culture: "the big challenge is not even legislative anymore. I think it is cultural."				

Dimension Worldview (Needs)						
Variable	**Type**	**Question**	**Values**	**Missing**	**Action**	**Correction *Id***
-	-	11. For each selected interview excerpt, mark its degree of importance for the need associated with the statement or question presented.	1 = Irrelevant; 2 = Little importance; 3 = Important; 4 = Very important; 5 = Essential; 0 = I do not know, or I prefer not to comment	0 and empty	Convert to the numeric scale.	NA
nec_transp	Ordinal	Transparency: “So, it is crucial that society can follow. Today there are tools. Any Brazilian can access TV Câmara, Rádio Câmara, and the Chamber, Senate, and Congress websites and follow the debates.”				
nec_dighuman	Ordinal	Human dignity: "We really need a law to implement a human department to see if there is injustice with the labor relationship, with people..."				

Dimension Worldview (Needs)						
Variable	**Type**	**Question**	**Values**	**Missing**	**Action**	**Correction *Id***
nec_divers	Ordinal	Diversity: “The issue of diversity is not about gender only, but it is diversity in the broadest sense. People are different. Territories are different. So, the fullness of diversity needs to be respected. Because regulation is a standard, and sometimes the pattern is dumb. So, you have to perceive how this affects the different actors in the ecosystem.”	1 = Irrelevant; 2 = Little importance; 3 = Important; 4 = Very important; 5 = Essential; 0 = I do not know, or I prefer not to comment	0 and empty	Convert to the numeric scale.	NA
nec_aderesoc	Ordinal	Adherence to society: "as these companies that appeared in the market, they greatly reduced the price of the product, and they made the market more agile, that is, the service that is provided is a service provided much faster, much more agile, much more efficient and with a much lower price, society tends to consider that these companies are doing a good business, they are meeting society's desires, these companies are right. They offer work and very high-quality service to society."				
nec_protsoc	Ordinal	Social protection: "I believe; I even read some guys on the subject... I believe that a universal basic income should already be considered. I understand the problems of this income because what is basic in one place is not basic in another, but people will need to be prepared to either change jobs or adapt to a new phase. Anyway, it takes at least three years of preparation to change… two years. So, what do you do?... It is complicated."				
nec_govprot	Ordinal	Government protagonism: “I often noticed that whoever was in the area, inside the government, had a perhaps more accurate perception of the existing problems than an external consultancy. Of course, it also adds value, but I do not see the possibility of replacing the analysis of those in public administration with a consulting study.”				
nec_nacional	Ordinal	Nationalism: “You have to commit to the citizen, a commitment to society, a commitment to territory, a commitment to the nation.”				
nec_planlp	Ordinal	Long-term planning: “Because what I miss as a politician, as a deputy, as someone who feels the need to be accountable, what is our plan for two thousand and forty, two thousand and fifty? Where do we want to go?”				

Dimension Worldview (Needs)						
Variable	**Type**	**Question**	**Values**	**Missing**	**Action**	**Correction *Id***
nec_particip	Ordinal	Participation: "I think that the digital divide accentuates the situation that already exists about the fact that not everyone affected by a phenomenon will naturally participate in the construction of solutions. Some will naturally be spectators, and others will be actors, which was already true in the pre-digital world. So, some people want to get involved in processes of political discussion, debates, participation, and others will complain, they will think it is good, they will think it is bad, but they will not want to get involved."	1 = Irrelevant; 2 = Little importance; 3 = Important; 4 = Very important; 5 = Essential; 0 = I do not know, or I prefer not to comment	0 and empty	Convert to the numeric scale.	NA

Dimension Worldview (Concern)						
Variable	**Type**	**Question**	**Values**	**Missing**	**Action**	**Correction *Id***
-	-	12. For each selected interview excerpt, mark its degree of importance with the concern associated with the statement or question presented.	1 = Irrelevant; 2 = Little importance; 3 = Important; 4 = Very important; 5 = Essential; 0 = I do not know, or I prefer not to comment	0 or empty	Convert to the numeric scale.	NA
preoc_acessjus	Ordinal	Justice divide: “The normal driver doesn't have easy access to the legal system and, in a way, the apps they samba on. They do wrong things, nobody... the driver doesn't know how to complain.”				
preoc_incdig	Ordinal	Digital divide: “My grandmother lives in the countryside. Besides the generational matter, there is no telephone there. I think about the children who are growing up there. They are outside the digital world, where connectivity is a prerequisite.”				
preoc_impact	Ordinal	Results/Impacts: "The legislation must have much rationality, and a commitment to impacts, to results. It cannot be emotion. Furthermore, much legislation we see being processed and approved is pure emotion. Hence this will usually cause future problems."				
preoc_segur	Ordinal	Safety: “My concern is protection. It is so much so that my question to natália is about safety. My question to you is about security. All the questions I am going to ask are about protection.”				
preoc_busin	Ordinal	Business environment: “Then, there is our tax system too, which is an insane asylum. Nowadays, with the ease of setting up headquarters abroad, you see several startups setting up headquarters abroad, providing services here. We are scaring away the best we can have.”				

Dimension Worldview (Concern)						
Variable	**Type**	**Question**	**Values**	**Missing**	**Action**	**Correction *Id***
preoc_univers	Ordinal	Universality of benefits: “To serve the citizen within a state whose contact difficulty is much broader than in the region where we live. So, this discussion comes up a lot at this moment of the pandemic and the debate on 5G.”	1 = Irrelevant; 2 = Little importance; 3 = Important; 4 = Very important; 5 = Essential; 0 = I do not know, or I prefer not to comment	0 or empty	Convert to the numeric scale.	NA
preoc_defasleg	Ordinal	Delay of legislation: “Today, due to digital transformation, we see a phenomenon in which everything becomes the object of technology. All sectors of the economy, society, and the public sector are now impacted by these technological phenomena that generate a brutal change in the speed at which things happen and quickly create this lag in legislation approved by the National Congress.”				
preoc_assimet	Ordinal	Asymmetry:” It is a dispute, shall we say, illegitimate because some are subject to the entire regulatory framework, others are not.”				
preoc_punicao	Ordinal	Punitive bias: "Today, the rules are so strict on top of the error that, as I said, the person has no incentive to think outside their line there ((gesture with the hands in parallel limiting the vision)) with fear of making mistakes. Moreover, they are afraid of being punished... improbity... Today, I think the fear of making mistakes has become more expensive than corruption."				
preoc_instleg	Ordinal	Outdated legal institutes: You have our constitution, our fundamental document, and a series of mechanisms to protect certain legal assets, which no longer make sense. How will I restrict foreign capital on the internet if I can access the content from anywhere? Does that make sense? Does it make sense to talk about content quota? Does it make sense to speak about granting so you can provide a service?				

APPENDIX J Institutions' courses selected as the universe of respondents

Academic Group	Institution	Course	Counting e-mail
A Administration	FECAP	Administração	37
	FGVRJ	Administração Pública	57
		Economia	71
	FGVSP	Administração da Operação e Produção	25
		Administração Geral e Recursos Humanos	44
		Contabilidade, Finanças e Controle	33
		Marketing	27
		Planejamento e análise econômica	19
	Mackenzie	Administração	16
	UFBA	Administração	43
	UFRJ	Administração	104
	Unisinos	Administração	15
	USP-EACH	Marketing	22
	USP-FEA	Administração	58
		Contabilidade	23
		Economia	33
	USPRP	Administração	34
		Contabilidade	24
C Information Systems	FGVSP	Tecnologia e Ciência de Dados	38
	PUCRJ	Ciência da Computação	23
	UFAM	Ciência da Computação	35
	UFCE	Engenharia de Teleinformática	26
		Modelagem e Métodos Quantitativos	23
	UFPE	Ciência da Computação	151
		Engenharia de Produção	21
	UFRS	Ciência da Computação	102
		Informática	1
	UFSC	Engenharia de Automação e Sistemas	24
	Unicamp	Ciência da Computação	44
		Estatística	23
		Física	1
		Matemática Aplicada	35
	USP-EACH	Biotecnologia	1
		Sistemas de Informação	49
	USP-FFCLRP	Computação e Matemática	1
	USP-IME	Ciência da Computação	39
		Estatística	41
	USP-POLI	Engenharia	2
		Engenharia de Computação	34
		Engenharia de Telecomunicações e Controle	32
		Engenharia de Transportes	20
		Engenharia Produção	36
		Engenhraia de Sistemas Eletrônicos	37
L	FGVRJ	Direito	13

Academic Group	Institution	Course	Counting e-mail
Law	Mackenzie	Direito	1
	PUCRS	Direito	115
	UERJ	Direito	22
	UFMG	Direito	92
	UFSC	Direito	34
	UnB	Direito	82
	Unifor	Direito	16
	Unisinos	Direito	19
	USP-FD	Direito	163
	USP-FDRP	Direito	2
S Sociology	FGVRJ	Políticas Públicas e Governo	31
	FGVSP	Fundamentos Sociais e Jurídicos	23
		Gestão Pública	34
	PUCRJ	Sociologia	29
	PUCSP	Ciências Sociais	19
		Governança Global e Formulação de Políticas Internacionais	14
	UERJ	Ciência Política	26
		Sociologia	12
	UFABC	Ciênicas Sociais Aplicadas	1
	UFMG	Ciência Política	23
	UFPE	Sociologia	23
	UFRJ	Sociologia	15
	UFRS	Ciência Política	6
		Políticas Públicas	1
		Sociologia	17
	UFSCAR	Ciência Política	16
		Ciência, Tecnologia e Sociedade	26
		Sociologia	22
	UnB	Ciência Política	42
		Sociologia	39
	Unicamp	Ciência Política	20
		Sociologia	21
	Uninove	Cidades inteligentes e sustentáveis	1
	USP-EACH	Gerontologia	18
		Gestão de Políticas Públicas	32
	USP-FFLCH	Antropologia	14
		Ciência Política	15
		Diretoria Faculdade de Filosofia, Letras e Ciências Humanas	4
		Filosofia	24
		Geografia	37
		Sociologia	22
Total Geral			2710