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Short Paper

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Abstract

The 'digital first' paradigm and its ontological reversal proposition bring new risks and implications for governing and regulating digital technologies. This article reports the findings from a qualitative study of the justifications used in legislating a 'digital first' artifact: Australia's COVIDSafe contact tracing app. We build on justification theory ('orders of worth' framework) and use deductive qualitative analysis for examining 74 parliamentary records of proceedings (Hansards) in 2020 and 2021. The findings are structured in 38 empirical themes and 15 conceptual categories, which pertain to five orders of worth used in justifying the actors' positions. This research unpacks the complexities of the justifications invoked in the legislative debates and sheds light on the novel and important yet understudied practices of governing 'digital first' artifacts.

Keywords: Digital first, Justification theory, Regulation, Public Health, Contact Tracing

Introduction

Enacting the "digital first" paradigm (Baskerville et al. 2020) and its "ontological reversal and technically feasible design philosophy" can lead to significant risks (Rowe et al. 2020). There are many examples of adverse effects of this approach, including in the domains of technologies for crime prediction, health risk prediction, and debt collection (Rinta-Kahila et al. 2021). However, despite the utmost importance of regulating and governing novel digital first artifacts (Gozman et al. 2020), there is an important and understudied knowledge gap within the information systems literature regarding the effective ways of regulating these technologies given their scale, complexity, and pervasive use. Scholars have called for more scrutiny and control over giant tech vendors (Zuboff 2019). This might translate into increased regulatory powers of governments on the deployment and use of IT, including through tougher data protection regulations, more stringent sanction regimes, or the establishment of regulatory and oversight bodies.

The declaration of the COVID-19 global pandemic in March 2020, and the subsequent public health management crises, motivated governments and tech companies to deploy various forms of digital surveillance and contact tracing applications. Many governments and tech companies around the globe rapidly developed and deployed COVID-19 contact tracing apps and encouraged citizens to use them. Most of these COVID-19 contact tracing apps followed the digital first paradigm, where digital artifacts were created to represent reality before reality is known (Baskerville et al. 2020). Given the scale of the COVID-19 phenomenon and the urgent need for pandemic management actions, designers went for what was technically feasible for mass surveillance and tracking of individuals. Often, the digital first approach was

combined with inadequate regulatory and governance provisions. For example, in the UK, the "NHS test and trace" app went live without a data protection impact assessment (DPIA) – an alleged violation of the General Data Protection Regulation (GDPR) (Akhlaghpour et al. 2021).

Traditionally, many regulators have been playing catch-up when it comes to novel digital technologies (Moses 2011). For example, the US Congress summoned the CEO of Facebook for testimony only after the infamous Cambridge Analytica scandal, where Facebook admitted to mishandling data from over 50 million users. During that hearing, several lawmakers "appeared to confuse rudimentary concepts" raising questions about their digital literacy (Guess and Munger 2022, p. 1). In this study, we contend that the 'digital first' paradigm intensifies the need for a proactive (rather than reactive) approach to regulating digital artifacts. In the digital first era, where "digital technologies shape reality" (Baskerville et al. 2020, p. 511), proactive regulation of digital artifacts is required to minimize the risk of real harm to individuals (Rinta-Kahila et al. 2021). Regulatory protection of individuals and their personal data can also contribute to the successful diffusion of digital artifacts (Akhlaghpour and Lapointe 2018; Hassandoust et al. 2021).

Given the novelty of the digital first phenomenon and the importance of regulating it, our overarching research question is "how can digital first artifacts be proactively regulated?" As a step towards addressing this question, in this paper, we study the revelatory case (Yin 2018) of legislating Australia's COVIDSafe contact tracing app. We examine the main themes that surfaced during the legislative debates and discursive strategies used for justifying different and often opposing positions in this process. To this end, we build on justification theory (Boltanski and Thévenot 2006).

Theoretical Background and Literature Review

"Justification theory" or "orders of worth" theory focuses on analyzing the different orders of worth, economies of worth, or value systems that constitute modern societies. Table 1 illustrates the six orders of worth as identified in the seminal work of Boltanski and Thevenot (2006). Individuals or institutions draw upon these orders of worth to justify their choices and actions. There are several core ideas of the theory relevant to this study. In particular, the theory posits that instead of having a single value system, a society is built on interwoven and often conflicting systems. Justifications (of choices, decisions, and actions) are made using different orders of worth. If different institutional actors (e.g., legislators who are involved in discussion and debates) agree on the value system that applies to a particular situation (e.g., the decision to limit the government's access to personal data), then the legitimacy of the justifications can be assessed based on whether they are consistent with that value system (justifications can be tested for legitimacy). However, in cases where different institutional actors draw upon different value systems, a test of legitimacy is not readily available. The orders of worth as a theoretical lens helps in understanding how institutional actors justify their decisions and actions based on shared value systems. It also explains how reconciliation and compromise between value systems can lead to specific decisions and actions. Table 2 provides a sample of studies in information systems literature that have used the 'orders of worth' theory. We extend this stream of research by applying this theory to the theoretically and practically important context of IT regulation. Given the primacy of justification and discursive practices in the process of legislating a new technology, justification theory is a promising lens for analyzing this phenomenon.

	Inspired	Domestic	Civic	Renown	Green	Market	Industrial
Mode of evaluation (worth)	Grace, nonconformity, creativeness	Esteem, reputation	Collective interest	Renown, Fame	Environmental friendliness	Cost, Price	Productivity, Efficiency
Test	Passion, enthusiasm	Trustworthiness	Equality and solidarity	Popularity, audience, recognition	Sustainability, renewability	Market competitiveness	Competence, reliability, planning
Format of relevant information	Emotional	Oral, exemplary, anecdotal	Formal, official	Semiotic	Ecological ecosystem	Monetary	Measurable: criteria, statistics
Qualified human	Creative beings, artists	Authority	Equal citizen, solidarity unions	Celebrity	Environmentalist, ecologist	Customer, consumer, merchant	Engineer, professional, expert
Table 1 Orders of worth (our own illustration based on Boltanski and Thevenot 2006)							

Author(s)	IS Context	How 'orders of worth' was used or informed the research aim	Empirical approach	Key findings
Spindeldreher et al. (2020)	IS research	Evaluating and mapping the justifications of IS scholars for describing the motivation, purpose, and relevance of their research.	Mixed-methods	IS research in 'MIS Quarterly' and 'Information Systems Research' (2014-2017) is predominantly justified by three orders of worth: market (63.1%) industrial (25%) and civic (19.5%).
Marsan et al. (2020)	Free/Open Source Software	Studying the creation of markets and how service providers use entrepreneurial actions to legitimate their services.	Case study	FOSS service providers use 'product-based theorization actions' and 'evangelization actions' to legitimate their services in the market.
Barros and Michaud (2020)	Social media	Exploring how members try to resist democratic degeneration and considering power relations in the justification context.	Discourse analysis	Identifying some hegemonic paths in the justification strategies and more importantly, the power and control issues around the justifications. The civic world was the main argument strategy by resisters.
Rolandsson (2020)	Social media	Investigating how police officers, drawing on logic, assess their discretionary awareness of using social media.	Semi-structured interviews	Situated problem solving and relational moderation as justification modalities shape police officers' awareness and help them to actualize affordances of social media. Order of worth such as domestic and civic value moderated their discretionary awareness assessment.
Mercier-Roy and Mailhot (2019)	Sharing economy device	Focusing on the concept of the common good and investigating the moral and performative dimension of controversies and concerns raised by sharing economy.	Case study	Agencements and different definitions of the common good are harmonized by and resulting from a recomposition of different elements (e.g., laws, devices, conventions, persons). The industrial form of worth is central in understanding what should be valued.
Barbe and Hussler (2019)	Decentralized evaluation in sharing economy	Examining how user community in the evaluation of the system express themselves and contributes to the different orders of worth in the market organization	Case study	An examination of three orders of worth (domestic, industrial, and project worlds) revealed pluralism between organizers and users in sharing economy market. Due to the nature of the system, the evaluation does not provide support on the co-existence of expression of all types of orders.
Schlagwein (2018)	Digital nomadism	Understanding the different types of explanation and underlying justification on why people engage in digital nomadism.	Ethnographic research	The desire for cultural and personal experience (inspired), belonging to a specific community (civic), and lower costs of living (market) were the main justifications that drive digital nomadism activity.
Sharon (2018)	Digital health	Investigating the different orders of worth as moral repertoires and visions invoked by actors involved in 'Googlization of health research'.	Analysis of promotions and interviews	Moral repertoires in digital healthcare were identified in five categories: human rights (civic), market good, data system to streamline (industrial), project requiring innovation, and intrinsically worthy
Bajpai and Weber (2017)	Information privacy	Analyzing public discourse on privacy as an abstract category and how it was translated and tailored in a new institutional context.	Mixed-methods	Among six orders of worth, the civic order was predominant in both media and institutional discourses. Privacy as a public good, government surveillance concerns, and privacy violations as social harms strengthen the civic order in these discourses.
Miranda et al. (2015)	Social media	Discovering how an organizing vision of social media as an IT innovation is hierarchically structured.	Mixed-methods	Four distinct schemas of technology (efficiency-engineer, brand-promoter, good-citizen, and master-of-ceremonies) were structured through six orders of worth as cognitive building blocks.
Antonopoulou et al. (2014)	Digital technology development	Investigating how digital technology values (economic/finance and non-monetary) are justified towards value propositions.	Case study	In different phrases of the serious game development, value elements and the orders of worth (functional, industrial, quality, performance, market, and civic) were differently combined and recombined to illustrate a collective agreement on an overall value proposition.

Table 2 Selected studies on justification theory in the context of information systems (IS)

Research Methods

Our study relies on qualitative analysis to investigate how different actors (legislators) justify their positions. We performed a qualitative thematic coding of the parliamentary records of proceedings (Hansards) pertaining to the development and maintenance of regulations about the COVIDSafe app. The analyzed texts included 74 parliamentary Hansards with the word "COVIDSafe" in them, dated between May-2020 to Nov-2021. These Hansards included transcripts from the Australian Senate, House of Representatives, and Federation Chamber and committee hearings.

Parliamentary debate transcripts offer a rich source of textual data with the opinions, positions, and policy preferences of elected politicians. Particularly, in the case of the COVIDSafe app, these debates led to the passing of the Privacy Amendment (Public Health Contact Information) Bill 2020, which governs how data collected by the app will be stored, submitted, processed, and eventually deleted.

We used deductive qualitative analysis (Gilgun 2019) to move between the emerged themes from our coding and the overarching theory of justification (orders of worth). Deductive qualitative analysis is an alternative to purer forms of phenomenological inquiry and grounded theory. More precisely, in a deductive qualitative analysis, "*researchers develop hypotheses, sometimes rough and general approximations, prior to entry into the field or, in cases where data already are collected, prior to data analysis. These hypotheses can be based on hunches, assumptions, careful examination of research and theory, or combinations.*" (Gilgun 1995, pp. 268–269). Based on this overarching approach, we performed thematic coding to confirm a good fit between the data and the seven "orders of worth" as identified in the general theory.
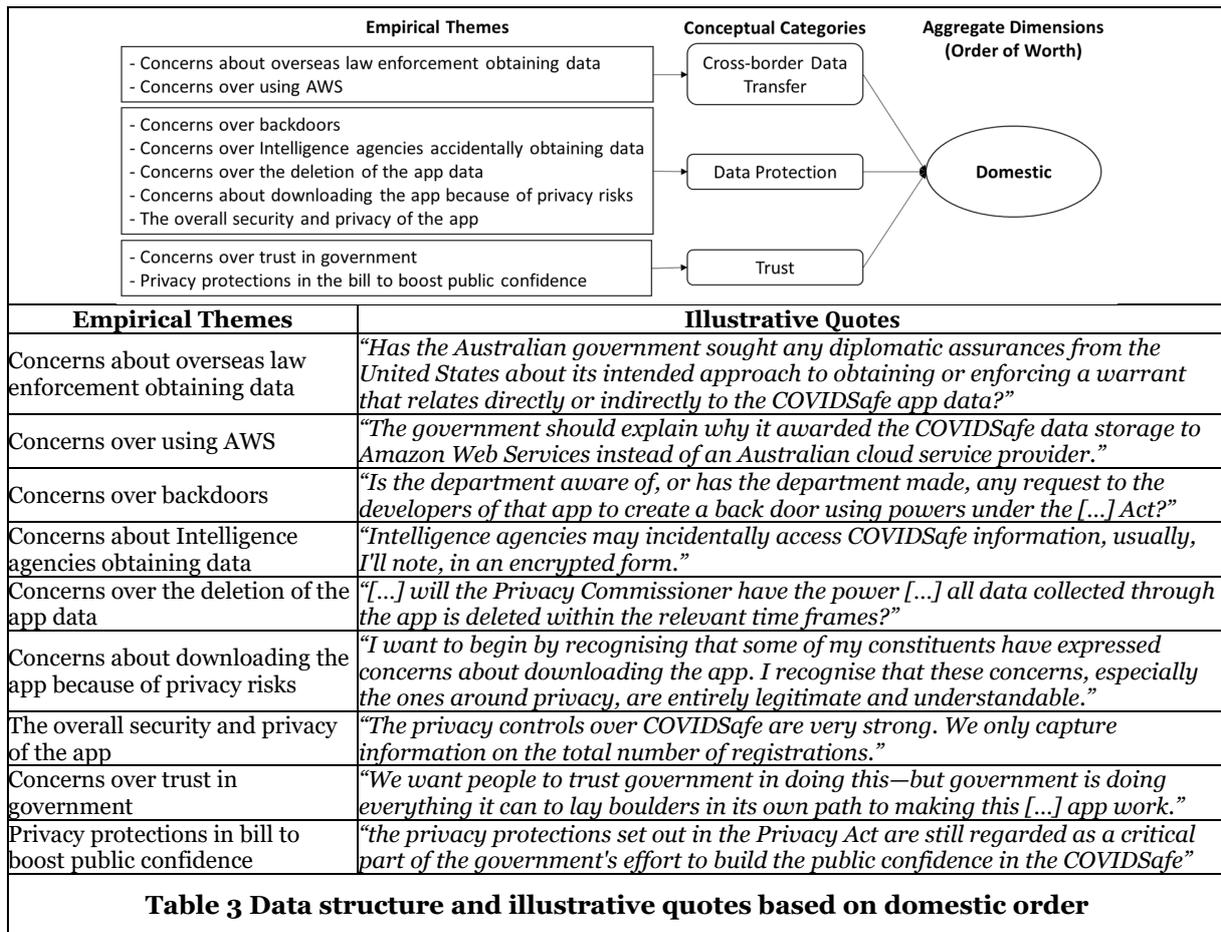
Preliminary Findings and Analysis

In our analysis, we identified references to five major orders of worth, namely, domestic, civic, market, industrial, and renown. We explain the use of each of these orders in the following sub-sections.

References to Domestic order

The prototypical domestic world values relationships between guardians and protectees. The archetypical actor of this world is "authority". In our data, one major manifestation of this order was the government's responsibility to protect Australians' personal data. Many concerns were relayed by opposition parties as to whether any breaches had occurred. There were numerous talks from the government representatives to explain "In many ways the privacy protections included in this bill are, to use a word of our times, 'unprecedented' in Australian law."

Another significant theme in this order revolved around the requirement of trust. Numerous comments were made about the lack of trust in the governing party and the prime minister. Among the sources of mistrust were past failures of the government in deploying digital solutions (examples from the text include the Australian government's MyHealthRecord system, online census, robodebt, and data retention scheme as well as the recent crashes of the myGov website). There were also concerns raised over the use of an American (non-domestic) cloud provider and the possibilities of data access by foreign governments. The government agency sought legal advice about the US Cloud Act and further insisted the data is being held in Australia and any discrepancies in the law, would have the Australian law held higher than the US. However, there could not be a firm guarantee of data protection from foreign agencies. Table 3 provides more details and quotes about the use of this order.

Empirical Themes	Illustrative Quotes
Concerns about overseas law enforcement obtaining data	*"Has the Australian government sought any diplomatic assurances from the United States about its intended approach to obtaining or enforcing a warrant that relates directly or indirectly to the COVIDSafe app data?"*
Concerns over using AWS	*"The government should explain why it awarded the COVIDSafe data storage to Amazon Web Services instead of an Australian cloud service provider."*
Concerns over backdoors	*"Is the department aware of, or has the department made, any request to the developers of that app to create a back door using powers under the [...] Act?"*
Concerns about Intelligence agencies obtaining data	*"Intelligence agencies may incidentally access COVIDSafe information, usually, I'll note, in an encrypted form."*
Concerns over the deletion of the app data	*"[...] will the Privacy Commissioner have the power [...] all data collected through the app is deleted within the relevant time frames?"*
Concerns about downloading the app because of privacy risks	*"I want to begin by recognising that some of my constituents have expressed concerns about downloading the app. I recognise that these concerns, especially the ones around privacy, are entirely legitimate and understandable."*
The overall security and privacy of the app	*"The privacy controls over COVIDSafe are very strong. We only capture information on the total number of registrations."*
Concerns over trust in government	*"We want people to trust government in doing this—but government is doing everything it can to lay boulders in its own path to making this [...] app work."*
Privacy protections in bill to boost public confidence	*"the privacy protections set out in the Privacy Act are still regarded as a critical part of the government's effort to build the public confidence in the COVIDSafe"*

Table 3 Data structure and illustrative quotes based on domestic order
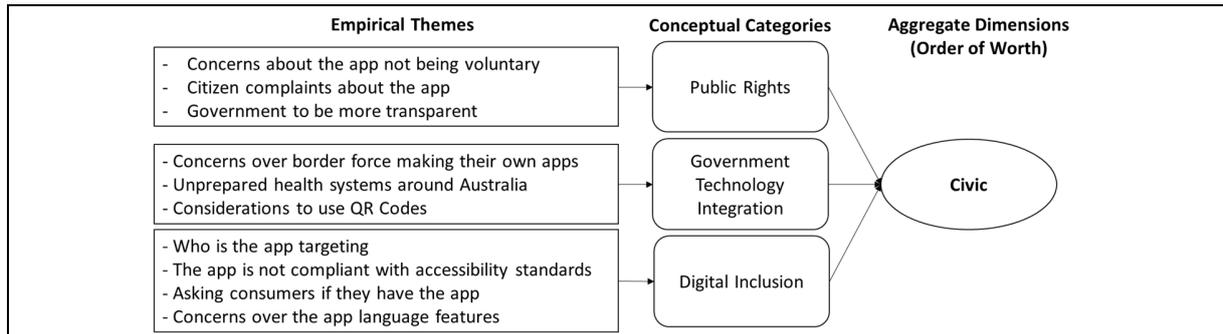
References to civic order

In the prototypical civic world, the predominant mode of justification is the well-being of the collective, and action governed by laws and rules is valued. Equality and solidarity are the manifestations of this order. In our analysis, we observed multiple themes related to the inclusion of all citizens (regardless of their background, language, and disabilities). There were also references to individual rights including their right to not use the app, file complaints about the app, and government transparency. Finally, as civic order demands an official and uniform approach from the government, the issues of integration across different digital artifacts were also highlighted in this order. Table 4 provides further details and direct quotes.

References to Industrial order

The prototypical industrial world values "technological objects and scientific methods" (Boltanski and Thévenot 2006, p. 203), efficiency, measurement, expertise, and progress. Not surprisingly, many of the technical aspects of the digital artifact were discussed using this order. Such technical aspects include the design choices, usability and safety of the app, and also technical measures of technology effectiveness. Trying to justify the success of the app was a major discussion point. The key data point that was referred to the most was the number of unique contacts the app found that manual tracing could not find. A lot of debates occurred about the 'underwhelming' result and how the app was deemed a failure because of that. Another metric used to promote success was the number of downloads. The prime minister stated initially that 40% of Australians needed the app for it to be effective with the initial number of downloads only being around 5 million. This then changed to 40% of mobile phone users, and the number of downloads increased to roughly 7 million. Resorting to the industrial order, many senators criticized the lack of downloads and compared them to other popular apps in Australia. Table 5 illustrates the details and quotes for this order.

Empirical Themes	Illustrative Quotes
Concerns about not being voluntary	*"People were worried about not being able to enter certain premises because the owner of the property might say, 'We're only allowing people in who have downloaded the app"*
Complaints about the app	*"There was one purported complaint made prior to that occasion, but I didn't have jurisdiction in relation to the matter."*
Government to be more transparent	*"the most important thing the government can do to encourage people to download the COVIDSafe app is to be open and transparent with Australians."*
Concerns over border force making their own apps	*"Has the department or Border Force been investigating or developing any tracing, tracking, compliance, law enforcement programs, tools or other capabilities related to the COVIDSafe app?"*
Unprepared health systems around Australia	*"I think, for a lot of the public health systems around the country, it would have been very hard for anyone to have been fully prepared for this pandemic."*
Considerations to use QR Codes	*We could very easily add a QR code into COVIDSafe, but, looking at the legislation that controls [...], a QR code would naturally provide location based information.*
Who is the app targeting	*"I think we are focusing on the adult population, because so few children seem to get infected."*
The app is not compliant with accessibility standards	*"Are you aware that the government's COVIDSafe app is not compliant with your government's own accessibility standards for disabled people?"*
Asking consumers if they have the app	*"Victoria [...] has reported that 1,851 people who've come into contact with the contact tracing system [...] indicated that they have the app."*
Concerns over the apps language features	*"My understanding is the app was launched on 27 April, but only translated into [...] more than two months later on 3 July, and it was only translated into [...] almost three months later on 20 July. Firstly, is that correct? Secondly, why were there delays?"*

Table 4 Data structure and illustrative quotes based on civic order

References to Renown order

The prototypical renown world values actors who command widespread recognition, opinion leaders, and influencers. In our analysis, this order was invoked when individuals became prominent (either as change agents championing the use of the app or as the targets of criticism or support). When the app was initially released the primer minister stated the app would be 'like sunscreen' and would protect all and that the use would allow states and the economy to reopen. This statement was highly criticized by opposition parties as being too misleading to the public, as it allowed users to believe they didn't need to conduct safe distancing practices. Table 6 provides further details and quotes related to the renown order.

References to Market order

The prototypical market world values competition and resource accrual. In this order, price and cost are the typical modes of evaluation. Based on our analysis, a major criticism of the app was how much it cost to develop and advertise the app. Many Senators were raising concerns about how much taxpayers' money was spent on the app. There were also several questions about how much money was spent on external contractors to develop the app, and if this expenditure can be justified based on the public health outcomes from the app. Table 7 provides further details and quotes from this order.

Empirical Themes	Illustrative Quotes
What is the process behind constructing the parameters of the app	*"Who made the decision that the app would only record contacts at closer than 1.5 metres and then longer than 15 minutes? Was this based on modelling that was provided or recommended or was it the minister's decision?"*
The delivery of the app	*"The DTA also delivered COVIDSafe in record time to help protect the health of citizens and the economic wellbeing of the nation."*
Target number of downloads to be effective	*"On 15 April, the Prime Minister said that at least 40 per cent of the Australian population would need to download the COVIDSafe app for it to work."*
The usefulness of the app	*"The [...] minister said yesterday [...]: The COVIDSafe app was developed with the right intention. It has obviously not worked as well as we hoped."*
Examining the success of the app	*"[...} well, many of us decided—it was a worthwhile piece of technology to at least trial. Has it been successful on one occasion?"*
A failure in a state	*"With respect, if it hasn't assisted us during the most acute phase of this crisis then it can't be characterised as anything but a failure."*
Is the app tested regularly	*"Do you undertake regular testing with the app to inform bluetooth strength between different handsets—how iPhones relate to Androids, for instance?"*
Concerns about users with diabetes	*"Diabetes Australia, [...], has had to warn people with diabetes who have downloaded the COVIDSafe app that it may interfere with their lifesaving continuous glucose-monitoring apps."*
Concerns about the usability of the app	*"I have to make sure I restart the app every time [...], that I've got my battery pack [...]. All of these are issues that this government has failed to deal with."*
Concerns about app updates	*"The risk is that they don't get access to the latest features. Through those 13 updates, we've made significant improvements [...] that allow greater accessibility."*

Table 5 Data structure and illustrative quotes based on industrial order

Empirical Themes	Illustrative Quotes
App to act like sunscreen	*"The COVIDSafe app, which was supposed to be 'like sunscreen' and enable the states and territories to reopen, failed to meet its download target"*
Recommendation to download the app	*"So we remain confident, as we continue to work together and encourage Australians to download the COVIDSafe app"*
Complaints about the Prime Minister's approach	*"How is it that the Prime Minister can [...] be saying that getting people to download the app is central to easing restrictions and getting people back to work, but [...] we don't really know how many need to do so for that to happen?"*
Fed up with the government	*"absolutely sick of the Prime Minister lecturing [...] after [...] an app that they are only announcing today that they are starting from scratch."*
Support of the Privacy amendment	*"I rise in support of the Privacy Amendment [...], which will amend the Privacy Act 1988 to ensure the security of data collected through the COVIDSafe app."*

Table 6 Data structure and illustrative quotes based on renown order

Empirical Themes	Illustrative Quotes
Return on taxpayer investment	*"When you won't be any longer spending taxpayers' money on this app? [...] and for an app that's really not doing the job that it was intended to do?"*
Cost for each unique contact from the app	*"$70 million for an app [...] can't find anyone. It's found 14 people. That's $5 million for every person it's traced. All spin, no delivery."*
External organizations involved in development	*"Were any consultants or contractors used for the development of the COVIDSafe app by the department?"*
Total cost of the app	*"Cost of the COVIDSafe app's specific advertising in 2019-20 was $6.95 million."*

Table 7 Data structure and illustrative quotes based on market order

Concluding Remarks and Future Research

Governing 'digital first' artifacts is particularly important and challenging, partly because they are expected to shape a yet unknown future reality, with often significant economic, social, and ethical implications (Baskerville et al. 2020). In this study, we analyzed the main themes that were discussed in legislating a consequential 'digital first' artifact (COVIDSafe app in Australia). Based on the 38 themes, we constructed 15 conceptual categories and highlighted how five orders of worth were used to justify legislators' positions.

Our study applies justification theory to a new domain of regulating digital technologies. Our preliminary findings highlight the need to depart from simple dichotomies of privacy vs. efficiency, or individual freedom vs. public good. The findings portray a complex picture of how institutional actors link a digital first artifact with specific orders of worth and mobilize different modes of justification in their attempt to influence the future reality that technology and human interactions will co-create (Baskerville et al. 2020).

We intend to continue this research by incorporating additional elements from our data, including the roles and political affiliation of the institutional actors, as well as the timings of invoking different modes of justification, into developing a process model of legislating digital first artifacts. It potentially theorizes how through the legislative debates one order of worth prevails or a compromise is reached. We also plan to build on our earlier work (Lockey et al. 2021; Namvar et al. 2022) and compare the themes from this study with the public discourse about the COVIDSafe app. We have curated propriety datasets of news media articles, reviews, and tweets about the COVIDSafe app. From a methodological perspective, in future research, we will use the qualitative findings from this study and apply dictionary-based automated text analysis for uncovering different modes of justification. This approach builds on the recent advances in data-driven computationally-intensive theory development methods (Berente et al. 2019). Combining manual and automated analysis helps develop rigorous methods for measuring institutional constructs such as orders of worth and addresses a methodological gap in the reference discipline (Reay and Jones 2016).

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