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Nerd Harder: A Critique of Techno-legal Solutionist Logics in Child Online Safety Laws

Abstract: Our analysis of child online safety laws (COSLs) recently enacted across U.S. states demonstrate how techno-solutionist logic manifests in three interdependent patterns: (1) the checklist fallacy (reducing safety to discrete technical features), (2) the false promise of age verification (assuming identity verification will prevent harm), and (3) the design determinism myth (overestimating design's power to shape social outcomes). Technologies can *influence* outcomes by offering (or not) certain design features (i.e., affordances), yet these designs do not *determine* the outcomes. This overconfidence that technology can determine an outcome risks ignoring the more complex and nuanced forces shaping children's online experiences. As concerns about youth mental health and social media use intensify, state legislators have increasingly embraced "techno-legal solutionism" – namely, the belief that complex social problems can be solved through legally-mandated technical fixes.

This techno-legal solutionist approach assumes that social media's effects on youth are primarily determined by platform design and therefore can be controlled through purely technical requirements imposed by law. The appeal of techno-legal solutionism is understandable: it offers seemingly clear solutions to complex problems. However, our analysis shows that this approach fundamentally misunderstands both the social shaping of technology and the complexity of youth wellbeing. Moving forward requires abandoning the fallacy that we can simply "nerd harder" our way to youth safety, and instead embracing the more challenging work of developing comprehensive, nuanced approaches that recognize both the limitations and possibilities of technical intervention.

Keywords: techno-legal solutionism; child online safety laws (COSLs); platform governance; youth mental health; social media regulation; technological determinism; design politics; regulatory innovation

Introduction

The relationship between social media and youth mental health has emerged as a defining policy challenge of the digital age (e.g., Office of the Surgeon General, 2023; Phippen, 2017). As concerns about youth mental health have intensified, policymakers have increasingly turned to "techno-legal solutionism" – the belief that complex social problems can be solved through technical mandates encoded in law. This legislative trend accelerated after Facebook whistleblower Frances Haugen's 2021 revelations about Instagram's effects on teen mental

health, catalyzing widespread demands for regulatory intervention (Bond & Allyn, 2021; Wells et al., 2021; Wells & Horowitz, 2021).

The appeal of technical solutions is understandable. If social media platforms harm youth through specific design features – infinite scrolling, autoplay videos, algorithmic recommendations – then controlling these features through law might seem like a straightforward fix. This logic has shaped policy responses at both federal and state levels. U.S. Surgeon General Vivek Murthy's 2024 call for warning labels and new regulations reflects this faith in technical interventions (Murthy, 2024). However, this approach contrasts with empirical literature. Studies have found limited evidence of direct causation between social media use and youth mental health outcomes (e.g., Ferguson et al., 2022; Odgers & Jensen, 2020; Orben & Przybylski, 2019). A report from the National Academies of Sciences, Engineering, and Medicine noted that adolescents' use of social media does not have purely negative or positive impacts, and that young people are impacted by constantly shifting risks and benefits of technology that affect people in different ways (Committee on the Impact of Social Media on Adolescent Health et al., 2024). Similarly, a report from the American Psychological Association emphasized that social media “is not inherently beneficial or harmful to young people,” with outcomes “dependent on adolescents' own personal and psychological characteristics and social circumstances” (American Psychological Association, 2023, p.3). Research suggests youth and social media present a complex matrix of benefits and risks that vary across demographic and contextual factors (e.g., Angel & boyd, 2024; Marwick et al., 2024).

Yet lawmakers continue to embrace techno-legal solutionism through policies that attempt to engineer social outcomes via technical mandates. Federal legislative attempts like the “Kids Online Safety Act” (KOSA) and “Kids Off Social Media Act” (KOSMA) exemplify this approach (Kids Online Safety Act, 2023; Kids Off Social Media Act, 2025). Such bills assume that youth wellbeing can be protected through technical requirements imposed on platforms – age verification systems, design restrictions, and limits on algorithmic recommendations (Murthy, 2024; Ortutay, 2024; Stella, 2025). While bills like KOSA and KOSMA have attracted bipartisan support, critics warn that they may actually harm youth by limiting access to important information and communities, while failing to address root causes of mental health challenges (e.g., boyd, 2024; Kelley et al., 2024; Marwick et al., 2024; Slavtcheva-Petkova et al., 2015; Stella, 2025; Tech Freedom, 2025a, 2025b). Efforts to regulate young people on social media

have not just been confined to the halls of Congress; state governments have also introduced a flurry of legislation. States have emerged as laboratories for techno-legal solutionism in online safety regulation (Brennan & Sanderson, 2024; Ryan-Mosley, 2023).

Lawmakers embrace a seductively simple solution to the youth mental health crisis: mandating technical fixes to social media platforms through law (e.g., Masnick, 2024). Rather than grappling with social, economic, and cultural factors affecting youth wellbeing, policymakers have increasingly focused on controlling technical features of social media platforms. In more colloquial parlance, these laws urge tech companies to ‘nerd harder.’ Technical systems exist within complex social, cultural, and economic contexts; society shapes technology and technology shapes society (e.g., Arnold, 2013; Hughes, 1993; MacKenzie & Wajcman, 1999). Yet such theoretical insights appear to have had little impact on policy development. Techno-legal solutionism follows a long history of techno-determinist and techno-solutionist beliefs that complex social problems can have neat technical solutions (Gardner & Warren, 2019; Milan, 2020; Morozov, 2013; Sætra, 2023).

In this project, we analyze state-level COSLs as a case study in techno-legal solutionism. In brief, state legislatures are attempting to wield the power of the law to compel platforms to make technological changes to their products in order to achieve desired social outcomes. In this case, lawmakers claim that these technical fixes will lead to improvements in the mental and physical health of young people. Through careful examination of these laws, we identify three complementary manifestations of techno-legal solutionist thinking: (1) reducing complex social problems to technical features; (2) privileging age verification and access control as harm prevention mechanisms; and (3) presuming platform design determines user behavior and wellbeing. Informed by existing techno-solutionist and techno-determinist literatures, these patterns reveal how techno-legal solutionism has become the default framework for addressing youth online safety, despite significant evidence that technology's social effects are neither simple nor deterministic (Marelli et al., 2022; Sætra, 2023). In other words, these patterns reveal both the appeal and limitations of attempting to engineer social outcomes through technical mandates.

This article proceeds as follows. First, we trace the theoretical lineage of techno-legal solutionism, provide an overview of the conflicting debates between both academics and lawmakers surrounding what constitutes a social media platform, and document the historical

evolution of legislative efforts in the United States to protect children online. Next, we present our analysis of state-level COSLs, documenting how different states have operationalized techno-legal solutionism through specific technical requirements. We then identify three key patterns in these laws that reflect and reinforce techno-solutionist assumptions, with implications for platform governance, youth agency, and regulatory innovation.

Our analysis makes several contributions. At the outset, we provide the first comprehensive mapping of how states are attempting to regulate youth social media use through technical mandates. We also demonstrate how techno-legal solutionism manifests in specific regulatory requirements, offering a framework for identifying and critiquing this approach. Finally, we propose alternative regulatory strategies that better account for the complex relationship between technical systems and social outcomes.

Theoretical Framework: From Technological Determinism to Techno-Legal Solutionism

The relationship between technology and society has long been a subject of scholarly debate, with various theoretical frameworks emerging to explain how technological change shapes social outcomes (e.g., Jasanoff & Kim, 2019; MacKenzie & Wajcman, 1999). Science and Technology Studies (STS) scholars have long emphasized that technologies can *influence* outcomes by offering (or not) certain design features (i.e., affordances), yet these designs do not *determine* the outcomes (e.g., Gaver, 1991; Gibson, 2015; Lievrouw, 2010). STS scholars are largely skeptical of techno-legal solutions to complex social problems (e.g., Angel & boyd, 2024; Appelgren, 2023; Morozov, 2013; Sætra, 2023; Selbst et al., 2019; Wyatt, 2008). Rather than helping vulnerable youth, scholars allege such an approach is “[m]ore likely [to] incentivize corporate performances of safety, reinforce tech companies’ technosolutionist logics, divert resources from other evidence-backed approaches, and empower politicians to challenge companies over highly politicized topics like gender affirming care, abortion, and sexuality” (Angel & boyd, 2024, p. 92). To understand the current wave of COSLs, we first examine three interrelated theoretical perspectives: technological determinism, technological solutionism, and techno-legal solutionism.

Technological Determinism and Its Critics

Technological determinism, which posits technology as the primary catalyst for social change, has significantly influenced both academic discourse and policy approaches. McLuhan's

(1964) famous assertion that "the medium is the message" exemplifies this perspective, suggesting that communication technologies fundamentally reshape human experience and social dynamics independent of their content. Winner (1986) contributed to this framework by highlighting the inherently political nature of technological artifacts, arguing that technical designs can either reinforce or challenge existing power structures.

However, contemporary scholars caution against falling into "the trap of technological determinism" by presuming purely causal relationships between technology and its social effects (Calo, 2022; Imperial, 2021). Critics argue that this framework is reductionist, overstating technology's influence while understating the social forces that shape technological development—like how technological determinism fails to account for power relations in the creation and adoption of new technologies (Fuchs 2013; Joyce et al., 2023). Alternative frameworks propose more nuanced relationships between technology and society. Scholars emphasize their symbiotic relationship, suggesting that technological and social changes are mutually constitutive and continually influence each other (e.g., Baym, 2015; Castells, 2009; MacKenzie & Wajcman, 1999).

The Rise of Technological Solutionism

Building on deterministic foundations, technological solutionism emerged as both a theoretical framework and practical approach to addressing social challenges. Morozov (2013) defines technological solutionism as the belief that technology can serve as a primary vehicle for social improvement. This perspective often manifests as technologically "utopian" ideas, reflecting an optimistic belief that technology's negative externalities can be addressed through further innovation (Markus, 1994; Nye, 1997). Solutionism is characterized by several key assumptions: that social-political issues can be treated as solvable puzzles (Paquet, 2005), that technical solutions should be pursued even before problems are fully articulated (Laclau & Mouffe, 1985), and that social issues can be made more efficient and rationalized through technical means. However, as Morozov (2013, p. 14) warns, this approach becomes dangerous when technology is viewed as something that can "fix the bugs of humanity."

Techno-Legal Solutionism in Practice

The emergence of techno-legal solutionism represents a distinct evolution in this theoretical lineage, emphasizing the role of legislation and regulation in mandating technical

solutions to social problems. This framework combines technological determinism's belief in technology's power to shape social outcomes with legal mechanisms for enforcing technical solutions. However, scholars argue strategies relying exclusively on either technological or legal solutions often result in reductionist regulatory approaches (Angel & boyd, 2024; La Diega, 2023). Critics warn that techno-legal solutionism can narrow the scope of possible interventions, potentially overlooking more comprehensive approaches to social challenges (Dencik & Hintz, 2017). In particular, this approach risks reinforcing "technologically driven capitalism," while failing to address underlying social justice concerns (Benjamin, 2023; La Diega 2023). This theoretical progression from technological determinism to techno-legal solutionism provides crucial context for analyzing current COSLs. These theoretical frameworks help explain both the appeal and limitations of using technical requirements to address complex social challenges. They suggest that effective policy approaches must move beyond simple cause-and-effect assumptions about technology's social impact to consider the complex interplay between technical systems, social practices, and regulatory frameworks.

To operationalize techno-legal solutions, lawmakers must first define their regulatory targets. This fundamental requirement of legislation—the need to clearly delineate what is being regulated—presents both functional and legal challenges when applied to social media platforms. Laws require precise definitions to be enforceable, yet social media's rapid evolution and diverse manifestations resist such static categorization. This definitional challenge exemplifies a core tension in techno-legal solutionism: how can we mandate technical solutions when the technology itself defies stable definition? The evolution of scholarly attempts to define social media platforms demonstrates why current regulatory approaches may be fundamentally misaligned with the dynamic nature of digital technologies.

Contrasting Scholarly Conceptions of "Social Media"

To better understand how state legislatures are approaching COSLs, and what the potential strengths and weaknesses of these laws are, we begin by interrogating how scholars have understood the ever-shifting and evolving boundaries of “social media” (e.g., Obar & Wildman, 2015). Social media researchers have long differed on what does and does not constitute a social media platform (Aichner et al., 2021; Mico, 2019; Srivastava, 2023; Yoo, 2024). Early scholarly definitions emphasized social media's role in fostering "virtual

communities" - focusing on how people used these technologies to create shared spaces and practices (Hagel, 1999; Romm et al., 1997). Virtual communities were often broadly organized around shared interests, hobbies, lifestyles, or some other organizing principle that involved the mutual production and consumption of online content (Balasubramanian & Mahajan, 2001). This user-centric understanding stands in contrast to current regulatory approaches that reduce social media to lists of technical features. Where early scholars saw "groups of people with common interests and practices communicating regularly," today's lawmakers see a checklist of design elements to control (Ridings et al., 2002).

The mid-2000s shift toward "social network sites" as a defining framework highlights another aspect current regulations often miss: the dynamic relationship between technical affordances and social practices - as scholars have noted that technology companies "rarely have the last word on design" (Angel & boyd, 2024; Waldman, 2019). While platforms like MySpace and Facebook introduced new technical features for profile creation and connection, their social impact came from how users adapted and repurposed these features (boyd & Ellison, 2007). This co-evolution of technical systems and social practices poses a fundamental challenge to techno-legal solutionism's assumption that controlling features directly controls outcomes (boyd, 2009; Van Looy, 2022). The emergence of platforms like Instagram, Vine, and Snapchat further complicated attempts at technical definition (Carr & Hayes, 2015; Kaplan & Haenlein, 2010). These services introduced new forms of user expression and interaction that transcended previous categorizations (Marwick, 2015; Sledgianowski & Kulviwat, 2009). While lawmakers attempt to regulate "social media platforms" as a coherent category, scholarly work shows how this term encompasses increasingly diverse technical systems and social practices. The gap between regulatory definitions and platform reality risks growing wider with each technological innovation. As platforms have grown and evolved over the last two decades, stakeholders have struggled with how to process and moderate their influence. This battle is a proxy for a larger discussion about the role of technology in society—and how technology itself may be leveraged to limit the potentially harmful effects of technological advances.

Protecting Children Online: COSLs as Case Study of Techno-legal Solutionism

The Regulatory Evolution of Youth Online Safety

Given the constant drumbeat of concern from the public regarding the impact of digital technologies on young people, efforts by lawmakers to regulate the online lives of youth also have a long and complicated history in the United States (Marwick et al., 2024; Orben, 2020). To understand the current wave of techno-legal solutionism in state-level COSLs, we first examine how U.S. policymakers have historically approached youth online safety. This history reveals an important shift: from early attempts to simply restrict access to harmful content, toward more ambitious efforts to engineer specific social outcomes through technical design requirements.

The evolution of U.S. youth online safety regulation reveals three phases, each reflecting different assumptions about how technology shapes social outcomes. The first phase, exemplified by the Children's Online Protection and Privacy Act (COPPA) of 1998, focused on data protection (Children's Online Protection and Privacy Act of 1998, 1998). COPPA's requirements for parental consent and restrictions on data collection represented a relatively modest form of technical intervention - one that acknowledged both the limits of technical solutions and the importance of parental oversight (boyd et al., 2011).

The second phase, marked by the enactment of the Child Online Protection Act (COPA) in 1998 and the Children's Internet Protection Act (CIPA) in 2000, attempted more direct technical control over youth online experiences through content filtering and access restrictions (Children's Internet Protection Act, 2000; Child Online Protection Act, 1998). These laws reflect what we might call a "technocratic disposition" - the belief that social harms could be prevented through technical barriers. COPA's ultimate failure in the courts highlighted both the constitutional and practical limitations of this approach (*Ashcroft v. American Civil Liberties Union*, 2002). While CIPA succeeded in requiring filters in schools and libraries, its effectiveness remained limited by technology's inability in the early 2000s to reliably distinguish between content that is harmful to children (e.g., obscene or pornographic content) and content that children have a First Amendment right to be able to access (Horowitz, 2000; Newell, 1999).

This historical progression reveals how policymakers have increasingly embraced technical solutions to address social concerns about youth online safety. Scholars have long

criticized these regulatory efforts as a moral panic, which relies on oversimplifications—of “youth” and “risks” and potential “solutions” (e.g., Kuipers, 2006; Marwick, 2008; O’Brien, 2024). These approaches demonstrate what Scott (1998) termed “seeing like a state”—the tendency of governments to make complex social phenomena legible through oversimplification and standardization. While early approaches like COPPA acknowledged the limits of technical intervention, contemporary COSLs reflect a more ambitious vision of engineering social outcomes through mandated design changes. Understanding how states are implementing these technical requirements—and the assumptions underlying their approach—requires examining specific regulatory strategies. As described below, our analysis reveals three complementary patterns in how states are attempting to translate social goals into technical mandates.

Technical Mandates as Social Policy: Implementing Contemporary COSLs

The theoretical tensions we've identified - between static and dynamic understandings of social media, between features and practices, between categories and continuums - manifest concretely in state-level COSLs. As states rush to regulate youth social media use, they face a fundamental challenge: how to translate complex socio-technical phenomena into legally enforceable technical requirements. Our analysis of state-level regulations reveals three distinct strategies for operationalizing techno-legal solutionism. (**Figure 1**). Each strategy reflects different assumptions about how technical changes can produce desired social outcomes. By examining how states have implemented these approaches, we can better understand both the appeal and limitations of techno-legal solutionism in practice.



Figure 1. Policymaking strategies for operationalizing techno-legal solutionism.

Analysis of State-Level Efforts to Protect Kids Online

Mapping State Approaches

In the absence of federal legislation, states have become laboratories for testing different forms of techno-legal intervention (Luria & Bhatia, 2025). Our research maps these interventions across four key dimensions: child online privacy protections, adult content age verification, social media age verification, and social media design codes.¹ Each dimension represents a different theory of how technical changes can protect youth wellbeing. As shown in **Figure 1**, twenty-two states have enacted child online privacy protections, representing the most traditional form of techno-legal intervention. (See **Appendix 1**). Other approaches include adult content age verification ($n=19$), social media age verification ($n=12$), and social media design codes ($n=6$). (**Figure 2**) This progression from privacy protection to design regulation reflects an increasing faith in technical solutions to social problems. However, the limits of techno-legal solutionism are already becoming apparent. As of March 2025, federal courts have enjoined online age verification laws in a handful of states – Arkansas, California, Florida (since reversed pending U.S. Supreme Court review), Mississippi, Ohio, Texas, and Utah – highlighting both constitutional and practical challenges to implementing technical fixes for complex social issues (Rieper, 2025).

¹ We note that these four approaches are comprehensive but not exhaustive. States have enacted other laws, like Utah's bill to protect children featured in their parents' social media (Lee, 2025).

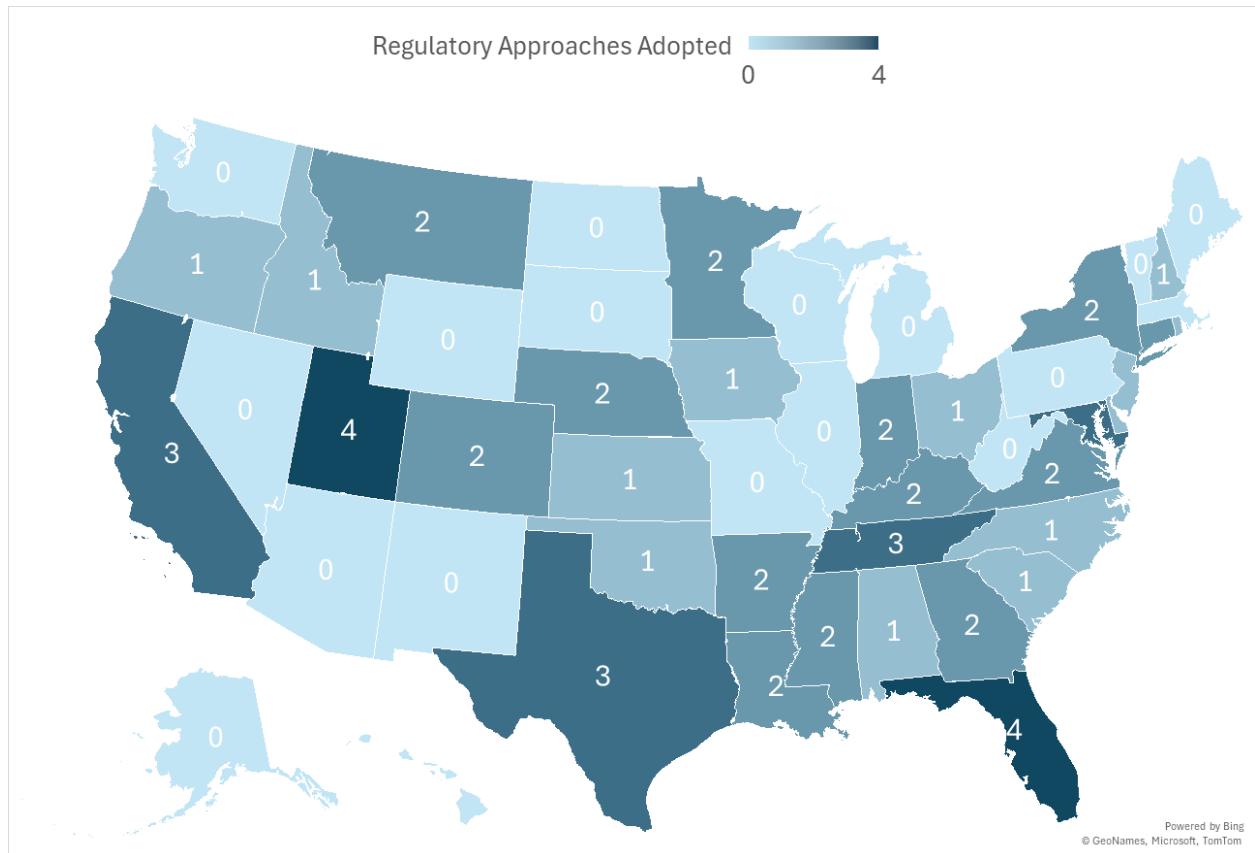


Figure 1. State-level legislative approaches to protecting children online (2022-2024).

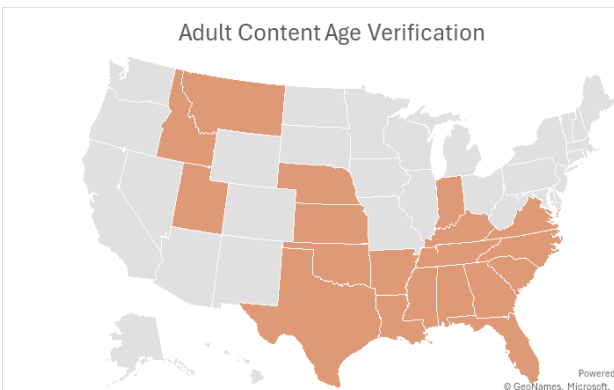
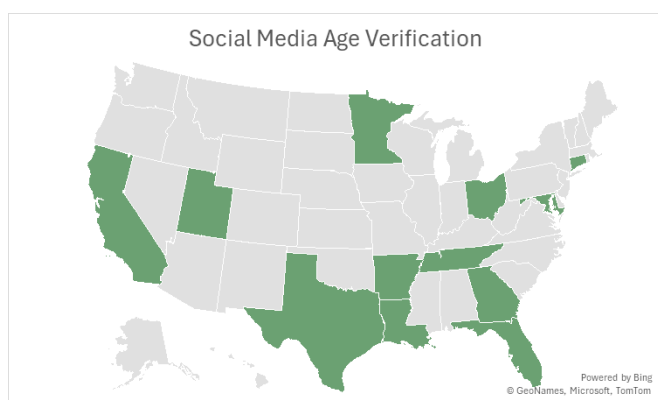
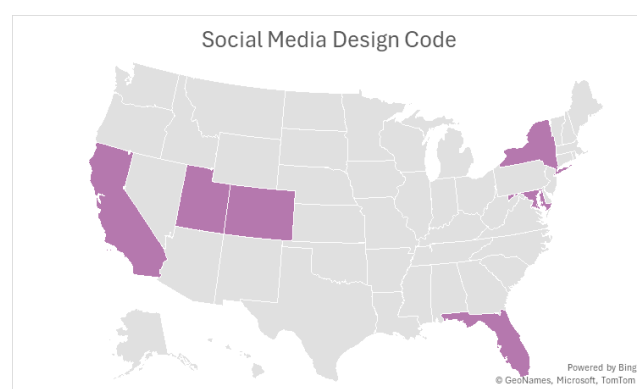
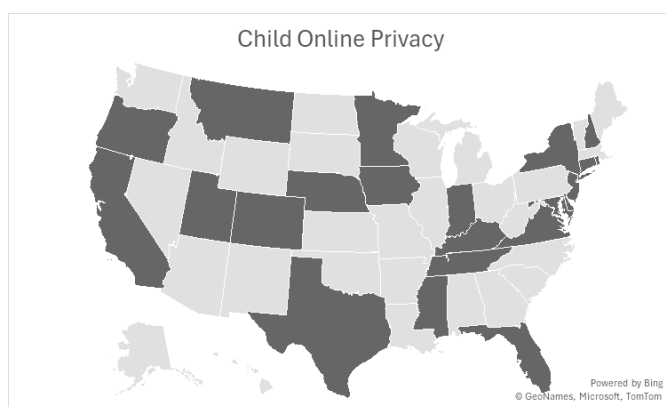
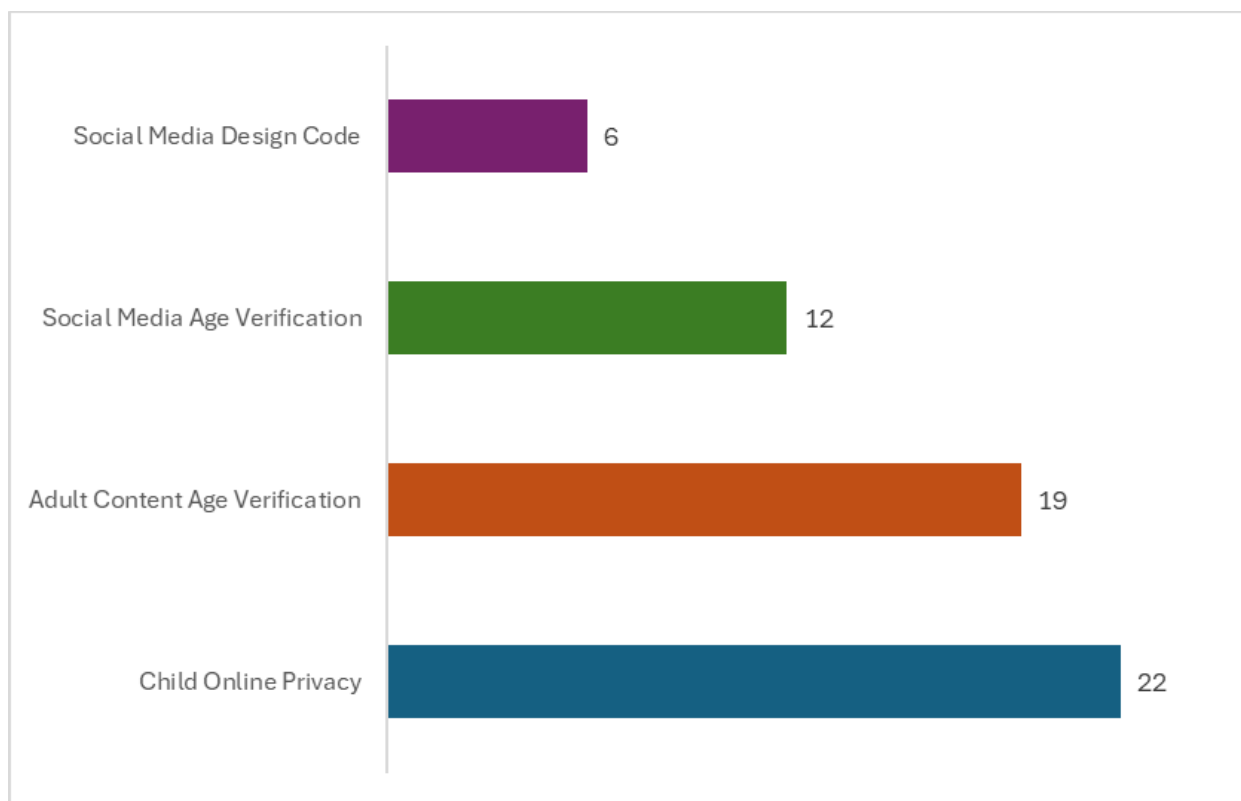


Figure 2. Regulatory approaches for state-level COSLs (2022-2024).

The Challenge of Defining and Controlling Social Media

Perhaps the most revealing aspect of state COSLs is how they attempt to define their technical target. Our analysis of the twelve states with social-media-specific regulations reveals the inherent tension between technical precision and social reality. As discussed below, states have adopted varying approaches to defining regulated platforms, each reflecting different theories about how technical features relate to social harm. (See **Figure 3**). The diversity of these approaches highlights a central paradox of techno-legal solutionism: the more precisely laws try to define technical requirements, the more likely they are to miss their social targets.

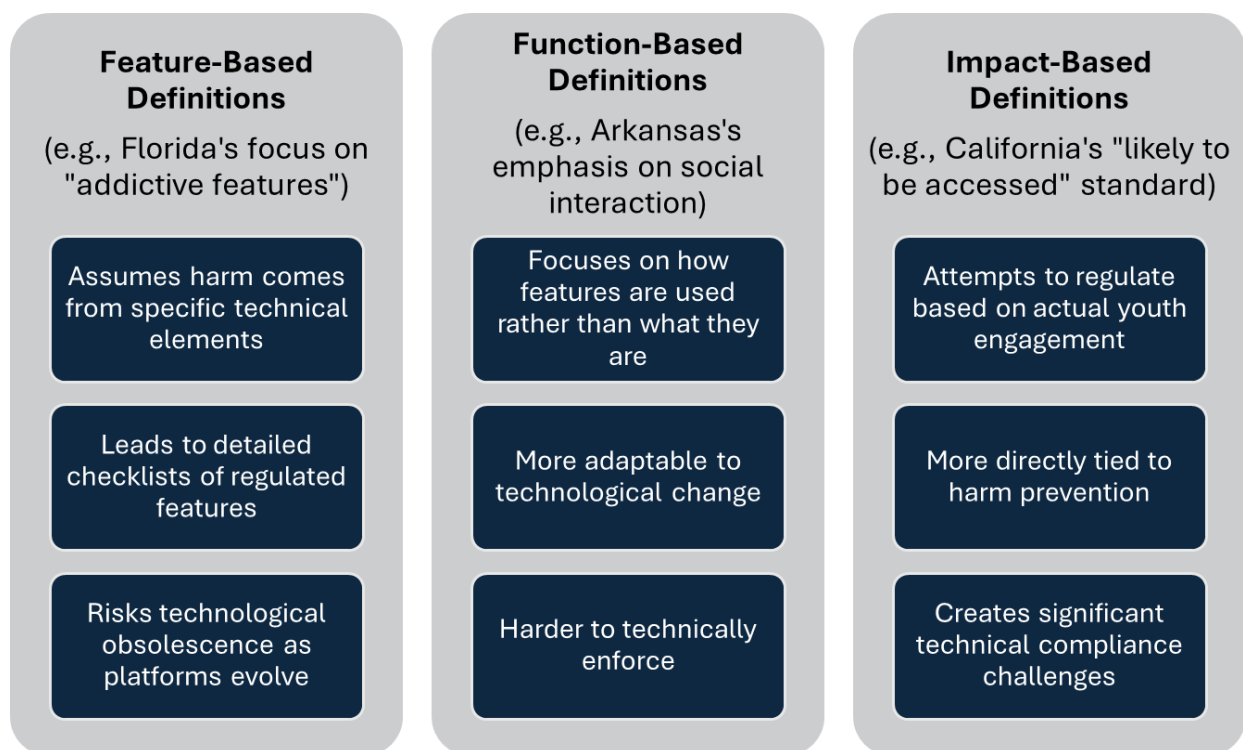


Figure 3. Varying approaches to defining regulated platforms.

The Architecture of Control: Analyzing Technical Requirements

The laws analyzed in this study reveal how techno-legal solutionism manifests in practice. State legislators have embraced a deceptively simple logic: if social media harms children, then we can protect children by controlling how social media platforms operate. This thinking reflects three key assumptions of techno-solutionism: (1) that complex social problems can be reduced to technical specifications; (2) that behavioral outcomes can be engineered

through platform design; and (3) that legal mandates can effectively force companies to "nerd harder" at solving social problems.

These assumptions become particularly evident in how states attempt to define and regulate social media platforms. As discussed below, policymakers have adopted varied inclusion and exclusion criteria for regulating online spaces. (See **Appendix 2**). The statutory definitions reveal a techno-solutionist mindset in several ways. First, they attempt to reduce complex social interactions to a checklist of technical features - "infinite scrolling," "push notifications," "auto-play video." Second, they imply that controlling these features will deterministically lead to (or perhaps nudge toward) better outcomes for youth. Third, they place the entire burden of solving youth mental health issues on technical solutions that platforms must implement.

This approach is particularly problematic because it reduces complex social phenomena to simplified technical specifications. It ignores the ways young people actively shape and repurpose technology (Angel & boyd, 2023; Morozov, 2013). In turn, it creates a false sense that we've "solved" the problem through technical fixes. Which, by extension, diverts attention and resources from other necessary interventions (e.g., mental health services, digital literacy education). And lastly, it risks ossifying current platform designs into law while failing to anticipate future technological evolution. We don't know if the next-best-thing is around the corner, but if we lock-in current designs, we may never know what improvements are possible.

Despite these fundamental limitations of techno-legal solutionism, it remains important to understand how these approaches are being implemented in practice. Our analysis of state requirements reveals how techno-legal solutionism manifests in specific technical mandates. These requirements fall into three broad categories, illustrated in **Figure 4**. Each category reflects different assumptions about how technical changes can produce social outcomes.

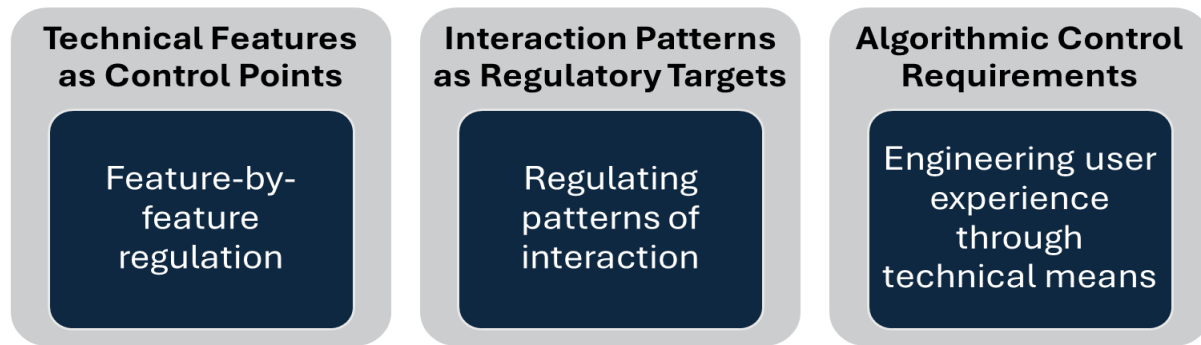


Figure 4. Regulations & specific technical mandates.

One approach states have adopted centers on identification of specific technical features as key control points for regulation. Florida's law exemplifies this approach, targeting "Infinite scrolling"; "Push notifications"; "Auto-play video"; "Live-streaming"; and "Personal interactive metrics." This feature-by-feature regulation reflects a core assumption of techno-legal solutionism: that social harms can be prevented by controlling specific technical elements. Yet this approach faces important deficiencies. First, features evolve faster than laws can be updated. Second, similar social functions can be achieved through different technical means. And lastly, the same feature may have both harmful and beneficial uses depending on context.

Other states focus on regulating patterns of interaction, requiring platforms to control "The ability to create or post content viewable by others" (Louisiana); "The ability to form mutual connections" (Georgia); or "Construct a public or semipublic profile" (Ohio). This approach recognizes that harm comes not from features alone but from how they enable interaction. However, it still reflects techno-solutionist thinking by assuming these interactions can be effectively controlled through technical means.

Lastly, and perhaps the most ambitious manifestation of techno-legal solutionism appears in requirements around algorithmic systems, from states like Florida ("Employs algorithms that analyze user data to select content"), New York ("Addictive feed" regulations), and Utah ("Algorithmically curated social media service"). These requirements reveal how techno-legal solutionism has evolved from simple feature control to more sophisticated attempts at engineering user experience through technical means.

The Exclusion Problem: When Technical Definitions Meet Social Reality

The extensive exclusions in state laws reveal the practical limitations of techno-legal solutionism. As lawmakers attempt to target "harmful" platforms while protecting "beneficial" ones, they create complex taxonomies that highlight the difficulty of reducing social distinctions to technical criteria. (**Figure 5**). These carve-outs reveal a fundamental contradiction: while techno-legal solutionism assumes technical features directly cause social outcomes, lawmakers recognize that identical features can serve both harmful and beneficial purposes depending on context. Technology isn't necessarily good or bad—and it isn't neutral (Winner, 1980; Kranzberg, 1986). That technological affordances aren't ontologically good or bad undermines a core premise of technical solutions to social problems.



Figure 5. Definitional exclusions based on technical criteria.

The Promise and Peril of Techno-Legal Solutionism

Our analysis of state COSLs echoes prior critiques of prior moments of intense public anxiety about youth media use that resulted in regulatory responses (e.g., O'Brien, 2024; Marwick, 2008). Like earlier attempts to regulate youth media consumption—from comic books to video games—current legislative efforts reflect what Marwick (2008) calls “technopanics,” where complex social issues are reduced to technical problems requiring technical solutions. This regulatory approach exemplifies what Scott (1999) terms “seeing like a state” – the bureaucratic imperative to make complex social phenomena legible through oversimplification. Yet this oversimplification comes at a cost: rather than meaningfully engaging with the complex

social and economic factors affecting youth welfare, these technical mandates risk pushing young users toward more dangerous unregulated spaces while simultaneously depriving them of beneficial online connections and resources (e.g., Marwick et al., 2024). Thus, COSLs represent a troubling paradox: while ostensibly designed to protect children, these laws may actually increase risks to youth wellbeing while using children's safety as a pretext for broader platform regulation.

Our findings also underscore different visions of how technology should be governed in service of social goals (e.g., Jasanoff & Kim, 2019; MacKenzie & Wajcman, 1999). State-level variations in the context of COSLs reflect distinct legislative priorities (e.g., addiction, data privacy, etc.). By extension, these variations reflect different assumptions about the relationship between technical design and social outcomes (Winner, 1986). This fragmented regulatory response highlights competing constructions of concepts like “social media,” “children,” and “risk” in policy discourse (Bulger, et al. 2017; Kuipers, 2006).

Techno-solutionism in Practice: Typology of Regulatory Approaches

Building on Morozov’s (2013) critique of techno-solutionism, our analysis of state-level approaches reveals three interrelated manifestations of techno-legal solutionism (**Figure 6**). Each approach reflects an oversimplified understanding of the social shaping of technology (e.g., Jasanoff & Kim, 2019; MacKenzie & Wajcman, 1999). And our typology aligns with STS scholars who have critiqued regulatory frameworks that attempt to engineer specific social outcomes through technical specifications (e.g., Angel & boyd, 2024).

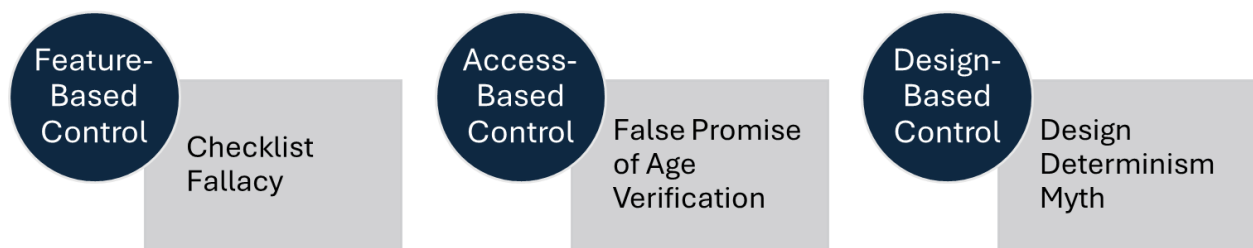


Figure 6. Typology of techno-legal solutionism in COSLs.

1. Feature-Based Controls & the Checklist Fallacy

States like Florida and New York exemplify what we might call the "checklist fallacy" - the belief that youth safety can be achieved by controlling a discrete set of technical affordances. This affordance-based approach fundamentally misunderstands how features shape user behavior. It assumes a direct, causal relationship between specific features and harm, ignoring how context shapes feature use. For example, while "addictive features" like infinite scrolling and push notifications might enable mindless browsing, it can also facilitate deep engagement with educational content or creative communities. This approach also treats features as discrete units that can be regulated in isolation, when in reality they function as part of an interconnected ecosystem. Disabling one "harmful" feature often simply shifts user behavior to alternative features or workarounds. Lastly, this approach ignores how young users actively adapt and repurpose features for their own needs. Research shows that youth can transform seemingly problematic features into tools for positive social connection, identity exploration, and peer support (Luria & Foulds, 2021, Thakur et al., 2023). Most importantly, the myth of mechanical solutions creates a false sense of progress by reducing complex social challenges to a simple technical compliance exercise.

2. Access-Based Controls & the False Promise of Age Verification

The widespread adoption of age verification requirements (seen in Arkansas, Louisiana, Utah, and others) demonstrates another form of techno-solutionism: the belief that social problems can be solved through identity verification and access control. This approach reflects striking assumptions, including that age is the primary determinant of harmful outcomes; that technical systems can reliably verify age; and that restricting access based on age will prevent harm. Yet this approach ignores the harms that identify verification can cause (Forland, et al., 2024). It presumes that age verification systems can be both accurate and privacy-preserving – a technical challenge that remains unsolved (Alajaji, 2025; Goldman, 2025; Jarvie & Renaud, 2024). Current age verification methods either risk compromising privacy through identity documentation requirements or are easily circumvented through basic deception (Kelley & Schwartz, 2023; boyd, et al., 2011). Moreover, age verification requirements can actually harm the youth they aim to protect by pushing them toward more dangerous unregulated spaces or encouraging deceptive practices that make it harder for platforms to offer age-appropriate protections. Lastly, these requirements may disproportionately impact marginalized youth who

may lack access to required documentation or whose parents are less able to help navigate verification systems (Milosevic et al., 2022; Redmiles, 2018). The focus on age as the primary risk factor also obscures other crucial variables like digital literacy, social support, and psychological resilience. Most concerning is how age verification requirements can hinder beneficial aspects of youth online engagement, including identity exploration, peer support, and creative expression through multiple accounts or pseudonymous participation (Luria & Foulds, 2021, Thakur et al., 2023).

3. Design-Based Controls & The Design Determinism Myth

Perhaps most notably, laws like California's Age-Appropriate Design Code and Utah's social media design requirements reflect what we might call the "design determinism myth" - the belief that platform design directly determines user behavior and wellbeing. The belief that platform design directly determines user wellbeing reflects a fundamentally flawed understanding of how technology shapes social behavior. While thoughtful design is important, this approach ignores decades of STS research showing that technology's effects are mediated through social, cultural, and economic contexts (e.g., Baym, 2015; MacKenzie & Wajcman, 1999). This approach underestimates users' agency in shaping how technologies are actually used (Angel & boyd, 2024; Waldman, 2019). It assumes a universal user experience, when research shows that the same design features can have yield different effects - based on user circumstances, skills, and social context. It treats platforms as static entities, rather than dynamic spaces that are constantly reshaped by user practices and social norms. And it ignores the broader social, economic, and cultural contexts that influence youth mental health (Slavtcheva-Petkova et al., 2015). These patterns reveal how techno-legal solutionism has become the default framework for addressing complex social challenges. Rather than engaging with the multifaceted nature of youth mental health or the complex relationship between technology and society, policymakers have embraced what seems like a simpler path: just make tech companies "nerd harder."

The Limits of Purely Technical Solutions

The varied approaches we've documented share a common limitation: they attempt to solve fundamentally social problems through purely technical means. Several critical problems emerge from this deterministic view. First is a displacement of responsibility. By focusing on

technical solutions, these laws place the entire burden of addressing youth mental health on platform design, potentially diverting attention and resources from other crucial interventions. In other words, the design determinism myth risks diverting attention from crucial non-technical factors affecting youth mental health, including economic inequality, social isolation, academic pressure, and family dynamics. By treating design as the primary driver of youth wellbeing, we risk neglecting these fundamental social determinants. And by extension, we risk a false sense of solution whereby technical fixes create the illusion that we've "solved" the problem - potentially reducing support for more comprehensive approaches to youth wellbeing. There is also a risk of regulatory inconsistency as the focus on technical specifications has led to a patchwork of inconsistent requirements across states, creating implementation challenges without necessarily improving outcomes. Lastly, by codifying current platform affordances into law, these approaches risk ossifying existing design patterns and potentially hampering innovative solutions to youth safety (Calo, 2022).

Conclusion

Our analysis reveals how techno-legal solutionism has become the default framework for addressing youth online safety, despite mounting evidence of its limitations. The varied approaches taken by different states serve as natural experiments in technical regulation, offering important lessons about both the appeal and the fundamental limitations of attempting to solve complex social problems through technical means.

State COSLs reflect three core promises of techno-legal solutionism. (**Figure 7**) And our analysis shows how each of these promises falls short in practice. Our findings suggest the need for a fundamental shift in how we approach youth online safety. Instead of asking platforms to "nerd harder," a multi-faceted approach may yield superior results (**Figure 8**). Such a multi-faceted approach would include a more fulsome recognition of technical complexity, a more intentional centering of youth agency, and a repudiation of a one-size-fits-all technological solution (Citron & Waldman, 2025; Park et al., 2024; Phippen, 2017).

The appeal of techno-legal solutionism is understandable: it offers seemingly clear solutions to complex problems. And such solutions are responsive to practical mechanisms within the powers of policymakers and platforms. In other words, these entities can't necessarily make malefactors good, but they can change interface designs. However, our analysis shows that

this approach fundamentally misunderstands both technological processes and the complexity of youth wellbeing. Moving forward requires abandoning the fallacy that we can simply "nerd harder" our way to youth safety, and instead embracing the more challenging work of developing comprehensive, nuanced approaches that recognize both the limitations and possibilities of technical intervention. Implicit within our critique is that this 'more challenging work' may require structural reforms to the political economy.

Our project has important implications for both scholarship and policy development. For scholars, it demonstrates how theoretical critiques of technological determinism can inform practical policy analysis. For policymakers, it offers concrete evidence of the limitations of purely technical solutions to complex social challenges. And for the broader debate about youth online safety, it suggests the need to move beyond simple technical fixes toward more nuanced and comprehensive approaches.

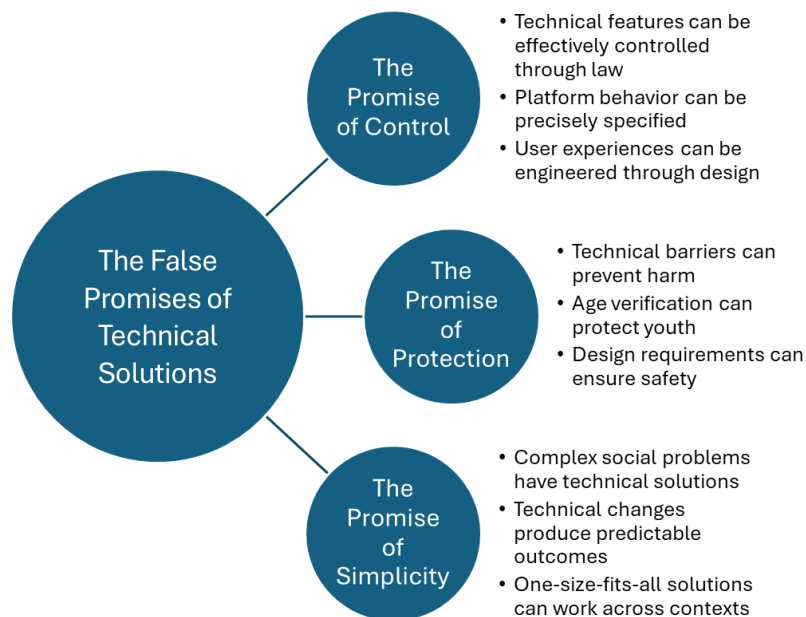


Figure 7. The false promises of techno-solutionism.

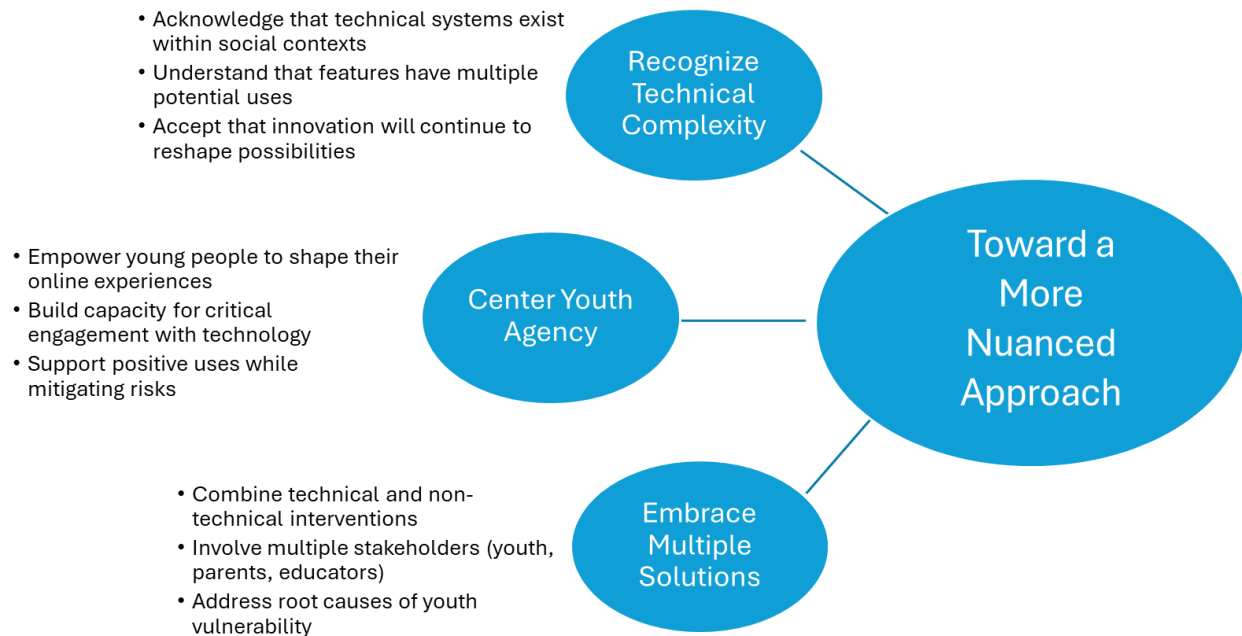


Figure 8. A multi-faceted approach to youth online safety.

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Appendix 1.

State	Child Online Privacy	Adult Content Age Verification	Social Media Age Verification	Social Media Design Code
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Alabama		✓		
Alaska				
Arizona				
Arkansas		✓	✓	
California	✓		✓	✓
Colorado	✓			✓
Connecticut	✓		✓	
Delaware	✓			
District of Columbia				
Florida	✓	✓	✓	✓
Georgia		✓	✓	
Hawaii				
Idaho		✓		
Illinois				
Indiana	✓	✓		
Iowa	✓			
Kansas		✓		
Kentucky	✓	✓		
Louisiana		✓	✓	
Maine				
Maryland	✓		✓	✓
Massachusetts				
Michigan				
Minnesota	✓		✓	
Mississippi	✓	✓		
Missouri				
Montana	✓	✓		
Nebraska	✓	✓		
Nevada				
New Hampshire	✓			
New Jersey	✓			
New Mexico				
New York	✓			✓
North Carolina		✓		
North Dakota				
Ohio			✓	
Oklahoma		✓		
Oregon	✓			
Pennsylvania				
Rhode Island	✓			

South Carolina		✓		
South Dakota				
Tennessee	✓	✓	✓	
Texas	✓	✓	✓	
Utah	✓	✓	✓	✓
Vermont				
Virginia	✓	✓		
Washington				
West Virginia				
Wisconsin				
Wyoming				

Appendix 2. State-level statutory definition inclusion and exclusion criteria.

Definitional features	Typology	Exemplars
Inclusion	Affordances	• “enables one or more users to create or post content that can be viewed by other users of the medium” (Colorado) • “Allows users to upload content or view the content or activity of other users” (Florida) • “allows an account holder to create a profile, upload posts, view and listen to posts, form mutual connections, and interact publicly and privately with other account holders and users” (Georgia) • “Create or post content viewable by other users” (Louisiana) • “Create or post content viewable by others, including on message boards, chat rooms, video channels, direct or private messages or chats, and a landing page or main feed that presents the user with content generated by other users” (Ohio) • “(i) Allows a person to create an account; and (ii) Enables an account holder to communicate with other account holders and users through posts” (Tennessee)
	Social interaction	• “application is to connect users in order to allow users to interact socially with each other” (Arkansas) • “a substantial function to allow users to interact socially with each other within the service” (Colorado)

		• “connects users in order to allow users to interact socially with each other” (Louisiana) • “Interact socially with other users within the confines of the online web site” (Ohio)
	Purpose	• “company that provides an online service, product, or feature likely to be accessed by children” (California) • “purpose of allowing users to create, share, and view user-generated content” (Colorado)
	Public availability	• “public or semipublic internet-based service” (Arkansas) • “a public or semi-public profile” (Colorado) • “a public or semipublic internet-based service” (Louisiana) • “Construct a public or semipublic profile” (Ohio)
	In-state users	• “has users in Arkansas” • “more than one hundred thousand active users in Colorado” • “has users in Louisiana”
	User profile	• “Ten percent or more of the daily active users who are younger than 16 years of age spend on average 2 hours per day or longer on the online forum” (Florida) • “reasonably likely to be accessed by children” (Maryland)
	User threshold	• “least five million account holders worldwide” (Louisiana)
	Algorithm	• “Employs algorithms that analyze user data or information on users to select content for users” (Florida) • “Algorithmically curated social media service” (Utah)
	Revenue threshold	• “annual gross revenues in excess of \$25,000,000, adjusted every odd-numbered year to reflect adjustments in the consumer price index” (Maryland)
	Addictive features	• “Infinite scrolling” (Florida) • “Push notifications” (Florida) • “personal interactive metrics” (Florida) • “Auto-play video” (Florida) • “Live-streaming” (Florida) • “addictive feed” (New York)

Exclusion	Age-gating	• “A service that, pursuant to its terms of use, does not permit minors to use the platform and utilizes commercially reasonable age assurance mechanisms to deter minors from becoming account holders” (Georgia) • “A service that, pursuant to its terms of use, does not permit minors to use the platform and utilizes commercially reasonable age assurance mechanisms to attempt to prohibit minors from becoming an account holder or user.” (Louisiana)
	Use-cases	• “short video clips of dancing, voice overs, or other acts of entertainment in which the primary purpose is not educational or informative” (Arkansas) • “interacting gaming, virtual gaming, or an online service, that allows the creation and uploading of content for the purpose of interacting gaming, entertainment” (Arkansas) • “crowd-sourced content for reference guides such as encyclopedias and dictionaries” (Colorado) • “cloud-based services that allow collaborative editing by invited users” (Colorado) • “interactive gaming, virtual gaming, or an online service that allows the creation and uploading of content for the purpose of interactive or virtual gaming” (Colorado) • “providing information concerning businesses, products, or travel information, including user reviews or rankings of businesses or products” (Colorado) • “providing career development opportunities, including professional networking, job skills, learning certifications, and job posting and application services” (Colorado) • “A streaming service that provides only licensed media that is not user generated in a continuous flow from the service, website, or application to the end user and does not obtain a license to the media from a user or account holder by agreement to its terms of service” (Georgia) • “News, sports, entertainment, or other content that is preselected by the provider and not user generated, and any chat, comment, or interactive functionality that is provided incidental to or directly or indirectly related to such content” (Georgia)

		• “Online shopping or ecommerce, if the interaction with other users or account holders is generally limited to the ability to upload a post and comment on reviews, the ability to display lists or collections of goods for sale or wish lists” (Georgia) • “Interactive gaming, virtual gaming, or an online service, website, or application that allows the creation and uploading of content for the purpose of interactive gaming, educational entertainment, or associated entertainment, and communications related to that content” (Georgia)
	Type of service	• Email (Arkansas; Colorado; Florida; Georgia; Louisiana; Tennessee; Utah) • Direct messaging (Arkansas; Colorado; Florida; Louisiana)
	Revenue threshold	• “‘Social media platform’ does not include a social media platform that is controlled by a business entity that has generated less than one hundred million dollars (\$100,000,000) in annual gross revenue” (Arkansas)
